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Food Security in India: The Bottom-Up Approach

Rumela Bhadra

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Editor's note: ASABE member Rumela Bhadra is a research associate in agricultural engineering at Kansas State University. Originally from India, she moved to the United States in 2006 to pursue her doctorate. Growing up in India and then studying U.S. agricultural systems has given her a useful perspective on food security in developing countries.

My morning routine includes sipping a cup of Darjeeling tea while reading the headlines from NDTV (the Indian news channel) and CNN. If you are a follower of global agricultural news, you may have heard about India's controversial Food Security Bill, a \$1.6 billion plan aimed at eradicating malnutrition. Under this bill, eligible people can purchase subsidized food for as little as 3 rupees (\$0.05) per kg (2 lb) for rice and 2 rupees (\$0.03) per kg (2 lb) for wheat. Depending on their monthly income, families can purchase up to 7 kg (15 lb) per month. The Food Security Bill includes additional allotments of grains at no cost to pregnant women, malnourished children up to 14 years of age, and starving people. This is the most ambitious bill announced by any democratically elected Indian government since India's independence in 1947.

Misconceptions

Here in the West, India is generally perceived as a growing middle-class society, with a relatively young population, where everyone is a computer whiz. In reality, India ranks second to last among 129 countries for malnourished children, even below underdeveloped countries like Nepal and Ethiopia. The International Food

Policy Research Institute ranks India 65 out of 79 on its Global Hunger Index, and India's own government estimates that nearly half of Indian children are malnourished. Hence, there is no doubt that India's food system needs an overhaul.

According to Spectrum Commodities (www.spectrum-commodities.com), India is the second largest producer of wheat in the world, at 65,856 thousand metric tons (TMT) per year on average. However, in order to meet its domestic needs, India imports 990 TMT per year (and exports about 767 TMT per year for international and diplomatic commitments). A growing population, climatic change, abnormal droughts, increased fertilizer prices, and lower groundwater reserves will likely mean more grain imports in the coming years.

Problems within

India also suffers from the age-old problem of corruption. When I was a child in India, there were ration shops in



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Sacks of rice stored in the open in India rot and suffer other damage. Sikh men pack sacks full of charity grain as part of their philanthropic religious duties to help the needy in Paonta Sahib, but a will surplus remain and go to waste.

the small towns where people could buy subsidized sugar, rice, oil, etc., with ration cards. Subsequent investigation has revealed that up to 55 percent of those subsidized commodities were illegally diverted from the ration shops to the open market at higher prices. Today, those ration shops are gone. The Food Security Bill will require similar storage and handling of commodities, in partnership with India Railways, at below-market prices. As with the old ration shops, I see a huge opportunity for corruption in that.

A growing population coupled with expanding urban areas might lead you to assume that agricultural land is shrinking in India. On the contrary, the World Bank reports that arable land has increased in India, from 58.82% in 1961 to 60.74% in 2011, and crop production has increased as well. Last year, *The Wall Street Journal* reported that 2012 would be a record year for grain production in India, more grain than the country can handle. The Food Security Bill is the government's way to distribute this surplus to the poor. However, that distribution still leaves a surplus of about 7.2 million tonnes (8 million tons) of grain, with no place to put it. Most of the storage facilities are located far from the grain fields, stressing the rail network and causing notorious delays. It is estimated that 7% of India's annual grain production goes to waste due to insufficient storage and a problematic distribution system. On August 23, the Indian Minister of Agriculture, Sharadchandra Govindrao Pawar, announced in the Parliament that about \$6.8 billion worth of fruits, grain, and vegetables are wasted every year due to lack of proper storage facilities.

Learning from the West

The grain storage infrastructure in the United States could offer a model for India. Modern grain storage facilities allow farmers to deliver quality grain at a fair market price. These concrete and steel structures, equipped with automated temperature and moisture controls, are expensive, but they would be a vast improvement over grain storage in old-fashioned gunny sacks, which is still common in India. Crop losses due to rot, infestation, and mold are also common in India. Additional economic losses result from the corruption and inefficiency of India's tangled system of transport companies and middlemen.

Can we use silo-based grain storage in India? Yes, but it will involve some challenges. First, India has very high humidity, and long-term grain storage will require research to establish viable storage parameters. In addition, the typical



Tractor loaded with bags of grain in Rajasthan, India.

farm in India is small, and its total production could not fill a single truck. Transporting small quantities of grain between small farms and rural silos is not cost-effective. As an alternative, transport terminals could receive grain directly from farmers, similar to farmers' co-ops in the United States. To explore these possibilities, the state governments of Haryana and Punjab have approached U.S. silo construction companies, but the results are yet to be seen.

Hermetically sealed silo bags could also be a viable option. Silo bags can store grain in high and low humidity conditions, with no pesticides, and they are economical, portable, and CO₂ controlled. The bags consist of three layers of UV and sunlight protected polyethylene. Industrial-size silo bags are up to 4 m (13 ft) in diameter and 100 m (328 ft) long. Based on the small scale of Indian farms, small bags would be more practical. Small silo bags would be transportable, and they would maintain grain quality just like expensive concrete silos. Similar bags are being used successfully for soybeans in hot, humid regions of Brazil.

Reaching for an answer

Whether or not such a bottom-up, farmer-based food security program will be free of corruption is debatable, and I am open to suggestions. In the meantime, while India can produce sufficient grain for its growing population, much of that production is lost because India has no modern infrastructure for grain storage and quality management. Any plan to improve food security in India must address that fundamental problem. In the short term, the Food Security Bill will reduce human suffering. In the long term, it will only give back to the farmers, at cheaper prices, the food that they produced in the first place.

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