

RESHAPING INDIAN FOOD AND AGRICULTURAL POLICY TO MEET THE CHALLENGES AND OPPORTUNITIES OF GLOBALIZATION¹

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Managing Director T.C. Venkat Subramanian, distinguished guests, and ladies and gentlemen, it is indeed an honor and a pleasure to be invited to give this 17th Exim Bank Commencement Day Annual Lecture. I have been interested in food and agricultural policy in India for a long time, and have focused my attention mainly on the nutritional impact of policy and technology decisions. But today, I want to direct my remarks mainly to the topic of Indian agriculture in the context of globalization, as this is one of the most critical policy issues facing India.

The food and agriculture situation in India today is remarkably different from that of 35 years ago, but too many of India's agricultural policies are still focused on the conditions of 35 years ago. With appropriate changes in policy, Indian agriculture could become an important force for economic growth, poverty alleviation, and competitiveness in the world economy.

¹ Exim Bank Commencement Day Annual Lecture, Mumbai, India, April 22, 2002.

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As an outsider, it is not my intention to preach to India about the course it should take. On the contrary, I have arrived at conclusions concerning the need for changes in policy based on what I have learned from India's own leading economists and from IFPRI's own research. At the International Food Policy Research Institute (IFPRI), we are fortunate to have Dr. Ashok Gulati as a senior member of our research and management team. Our research on Indian food policy over the years has been carried out in collaboration with leading Indian scholars, among them Professors G. S. Bhalla, V. Rajagopalan, C. Ramasamy, and S. Thorat.

Were we meeting 35 years ago, our concerns would be poles apart from those of today. I think that some of you, like myself, are old enough to remember the middle and late 1960s, when famine was averted in India primarily because of massive external food aid, mainly from the United States. In those days, the conventional wisdom among too many so-called experts was that India would never be able to feed itself, and that the international community should practice "triage," or lifeboat ethics, abandoning those unable to take care of themselves to their fate.

Because India adopted appropriate policies and was willing to adopt modern agricultural technology, as I will outline later, the country no longer faces food shortages and dependence on external food aid. On the contrary, the Central Government instead must tackle the problem of what to do with a 60 million metric ton stock of surplus of wheat and rice.³

I would like to proceed to briefly sketch out the current food security situation in India as I

³ Ministry of Finance (2002).

understand it, and then focus most of the remainder of my remarks on the current problems facing Indian agriculture, the promise and perils that globalization poses for a strategy of growth with equity in which agriculture plays a prominent role, and the place of science, technology, and public policies in such a strategy.

CURRENT STATE OF FOOD SECURITY: HUNGER AMIDST PLENTY

Even though food availability in India might be described today as a state of plenty, India also must grapple with the paradox of persistent hunger. According to the Food and Agriculture Organization of the United Nations (FAO), over 225 million Indians remain chronically undernourished. Alarming, this is an increase of 5 percent from 1991, the year in which the process of economic reform began in earnest, when 215 million Indians were food insecure.⁴

Malnutrition among preschool children is of particular concern. On the positive side, India and its South Asian neighbors have made steady, albeit slow, progress in reducing the incidence of child malnutrition since the mid-1980s, and the absolute number of malnourished preschoolers has fallen as well. But over half of all Indian preschoolers still suffer from malnutrition, compared to 33 percent in Sub-Saharan Africa, where child malnutrition is on the rise.⁵ Malnutrition is associated with about half of the 98 deaths per 1,000 live births that occur each year among Indian children under five years of age.⁶ For those who survive, it usually means irreversible damage to their physical and mental development.

⁴ FAO (2001).

⁵ Rosegrant *et al.* (2001).

⁶ UNDP (2001).

Adults whose growth has been stunted by childhood malnutrition are 2-9 percent less productive than non-stunted adults.⁷ Countless Indians will not grow up to be scientists, software engineers, creative artists, political leaders, entrepreneurs or productive farmers and workers because of this scourge.

A critical factor behind India's high rates of child malnutrition are birth weights of less than 2.5 kilograms for the affected children. In South Asia, 21 percent of the children are born with low birth weights, accounting for 64 percent of the world's low birth weight newborns. This is usually the result of poor maternal nutrition both before conception and during pregnancy. In effect, malnutrition is directly transmitted from one generation to the next.⁸ Cultural practices contribute to this situation: because families of daughters must pay bridegrooms a dowry, girls tend to receive less care and food than boys. Girls therefore have higher mortality rates than boys, and those who survive grow up malnourished and likely to have low birth weight babies. The problem is even more compounded for girls born into tribal and scheduled caste families, for such families are far more likely to be poor and food insecure.⁹

Generally speaking, if a person consumes an adequate level of calories, he or she will also take in enough protein. However, this does not guarantee adequate consumption of vitamins and minerals. Insufficient intake of these micronutrients – often called “hidden hunger” – affects vast numbers of people, with serious public health consequences. In South and Southeast Asia, 76 percent of pregnant women and 63 percent of preschool children are anemic, and around

⁷ Gillespie and Haddad (2000).

⁸ Allen and Gillespie (2001).

⁹ Meinen-Dick *et al.* (1997).

50 percent of the world's anemic women live in South Asia. Deficient iron in the diet is the leading cause of anemia. The risk of maternal mortality among anemic women is 23 percent higher than that of nonanemic mothers. Their babies are more likely to be premature, have low birth weights and die as newborns. The incidence of anemia is also high among South Asian infants and children. Anemia can impair child health and development, limit learning capacity, impair immune systems, and reduce work performance. Iron deficiency anemia is estimated to reduce productivity by up to 17 percent for heavy manual labor. Even when iron deficiency does not progress to anemia, it can reduce work performance. These effects of iron deficiency result in annual economic losses estimated at \$5 billion for the South Asia region.¹⁰

Insufficient intake of vitamin A among children in developing countries is the leading cause of preventable severe visual impairment and blindness and contributes to infections and death. Pregnant women who are vitamin A deficient face increased risk of mortality and mother-to-child HIV transmission. India has a high incidence of clinical vitamin A deficiency as compared to other Asian countries.

Both the state governments and the Central Government in India's federal system have established policies, programs, and institutions aimed at preventing and mitigating famine, improving nutrition, and assuring that poor and vulnerable Indians have access to food. These include the Maharashtra Employment Guarantee Scheme, the Tamil Nadu Integrated Nutrition Programme, the Integrated Child Development Services (ICDS), and

¹⁰ ACC/SCN and IFPRI (2000); Haddad and Gillespie (2000).

the Targeted Public Distribution System (TPDS). The efforts of the state government in Kerala to assure the well being of all the residents of that state, even in conditions of modest growth and widespread poverty, are especially noteworthy. I would also stress, drawing here on the work of India's own Nobel Laureate economist A. K. Sen, that the democratic institutions of this country, including the free press, have played an important role in eradicating famine and reducing chronic undernutrition. A democratic government, coupled with active and independent mass media and engaged organizations of civil society, is more likely to respond to the needs and demands of all its citizens than an authoritarian regime.¹¹

Although a number of factors contribute to food insecurity, it is widely recognized that poverty is the primary cause. In a country like India that produces large surpluses of basic food grains, it is clear that large numbers of people remain hungry because they have insufficient resources to purchase all the food they need. Improvements in India's already extensive safety net programs could help over the short-and medium-term. The long-run solution, however, is investment in human resources (assuring access to health care and education for all), empowerment of poor people to better articulate and pursue their interests, and programs and policies that assure poor people access to productive resources and employment opportunities. Taking such steps will benefit well-fed and food-insecure Indians alike, given the costs to the economy of hunger and malnutrition that I have noted.

India's efforts to address widespread micro-nutrient malnutrition have had mixed results.

¹¹ Drèze and Sen (1989).

The Central Government has been successful in controlling iodine deficiency disorders (which can lead to severe mental retardation) through an effective program of salt iodization. Distribution of vitamin A supplements has been a somewhat successful strategy, although this is more of a curative approach than a preventive one. The main approach to iron deficiency, distribution of iron folate supplements, is not regarded as successful.¹²

UNFINISHED ECONOMIC REFORM IN AGRICULTURE

As this audience knows better than I, for most of the first 40 years after independence, India pursued economic policies characterized by strict regulation of domestic and international trade, with substantial subsidies provided on many goods and services (notably food), and reservation of substantial segments of the economy to national, and especially small businesses. Public sector firms and government agencies played a major role in many areas of the economy, often operating on a monopoly basis. These policies reflected the strong commitment of India's founding fathers and mothers to nationalism, socialism, nonalignment, and self-reliance. Beginning tentatively in the 1980s, with a substantial deepening after 1991, governments led by various political parties have implemented economic policy reforms, including international trade liberalization, liberalization of direct foreign investment, a loosening of restrictions on large enterprises, and financial sector liberalization.

Some of the post-1991 results have been impressive. Despite concerns that greater openness

¹² Allen and Gillespie (2001).

to the global economy would make India vulnerable to external shocks, the Indian economy has grown at an average rate of 5.4 percent per year since 1997, notwithstanding the Asian economic crisis, increased energy prices, and a slowing international economy. At home, the economy has overcome natural disasters, sluggish agricultural performance, deepening communal tensions, acts of terrorism, and the very real possibility of war with Pakistan. Indeed, no one would think of calling India a "basket case" these days. Instead, your country is recognized as one of the world's fastest growing and most resilient economies. The urban and urbane middle class is roughly the same size as the whole population of the United States, and seeks sophisticated consumer goods. India is a world-class player in software and information technology.

In the agricultural sector, however, the policy reform process has been tentative at best. Controls and subsidies, created in an era of scarcity, impede the creation of an integrated national food system, and constitute a major barrier to India pursuing comparative advantage in the global economy. Parastatals continue to play a significant role, particularly in the food grain market. Most importantly, these controls and subsidies have not really benefited rural poor people. Instead, at least half of the fertilizer subsidy goes to keep several inefficient domestic fertilizer firms in business, at high cost to the treasury. Irrigation subsidies promote excessive use of agricultural water and actually drain funds from operations and maintenance of water facilities and the creation of new irrigation infrastructure. Power subsidies contribute to corruption and pilfering of supplies that are reported as agricultural uses. It is estimated that subsidies for fertilizer, irrigation water, and power account for over 2 percent of gross

domestic product (GDP), and nearly 9 percent of agricultural GDP. Agricultural subsidies are a big factor in the Central Government budget deficit, which is consuming 5 percent of GDP in the current fiscal year. The subsidies also contribute to regional inequality, as the states with the largest agricultural sectors reap the biggest harvest in subsidies, but the poorer states, which receive a small share, are the ones that are supposed to benefit.¹³

Whereas input subsidies help to encourage overproduction of food grains, and impose heavy storage costs on the government, other agricultural policies impede agricultural growth and diversification. Restrictions on the movement and stocking of grain keep private investments in storage and processing low. Taxes on agricultural processing enterprises are passed on to the farmers, and impede expansion of higher value-added exports.¹⁴ Such policies may have made sense when the government needed to assure cheap food availability in the late 1960s, but they seem wholly illogical at a time when India has more grain than it can use or store.

Two significant biases have characterized Indian agriculture over the past several decades: an emphasis on achieving food grain self-sufficiency at the expense of other crops, and a public investment emphasis on irrigated areas and, to a lesser extent, high-potential rainfed areas at the expense of resource-poor rainfed areas. But fruits, vegetables, oilseeds, milk and milk products, cut flowers, and agroindustry offer new opportunities, which could benefit small farmers as well as large, both at home and abroad. About 80 percent of India's rural poor

¹³ Gulati and Hoda (forthcoming); Gulati and Narayan (forthcoming).

¹⁴ *Ibid.*; Gulati and Hoda (forthcoming).

people live in rainfed areas, with about half living in zones with limited agricultural potential and/or infrastructure and market access. Population densities are increasing in these less favored areas despite lack of investment, and are likely to continue to do so for the next several decades.¹⁵

Past and current agricultural policies have also had a negative environmental impact. The increased yields achieved in Green Revolution areas preserved forests, hillsides, and fragile drylands from cultivation. However, poor natural resource management and excessive use of agricultural chemicals in the Green Revolution areas have led to soil salinization, fertilizer and pesticide contamination of waterways, pesticide poisoning of farmers and laborers, and declining water tables. These problems have implications for agricultural growth, overall economic growth, and food security, because natural resource degradation appears to be worsening, and has apparently led to stagnant and even declining yield growth in some of India's intensive farming areas.¹⁶

The process of economic policy reform needs to extend much more thoroughly into the food and agricultural sector. Agriculture remains extremely significant in India, and is a potential driver of both overall economic growth and poverty reduction. Value added in agriculture continues to contribute about 25 percent of gross domestic product (GDP), more than in most East and Southeast Asian countries, though less than in some other South Asian nations. Over 70 percent of the population lives in rural areas, and 62 percent of the workforce is engaged in agriculture. The overwhelming majority of Indian

¹⁵ *Ibid.*; Fan and Hazell (2000).

¹⁶ *Ibid.*; Hazell (undated)

farmers have very small farms, averaging less than two hectares in size.¹⁷ The rural poverty rate is about 20 percent higher than that for urban areas, and agricultural growth offers rural poor people the most likely path to sustainable livelihoods and well-being, whether they work on the farm or in nonfarm rural activities that are closely related to agriculture, such as processing, produce marketing, transportation, infrastructure development, farm input and implement production and marketing, and consumer goods demanded by farmers.

I want to emphasize that reforms that make agriculture more market-oriented do not reduce the importance of sound and transparent public administration. Indeed, effective government at both the Central and state level is a crucial component of reform. Government action will remain critical to provide safety nets for those who may be adversely affected by economic policy change, to maintain standards such as a system of weights and measures, to enforce contracts, and to make investments in public goods that are essential but that do not offer the private sector the likelihood of a profitable return. A good example of such public goods would be agricultural research and development (R&D) to breed drought tolerant and pest resistant varieties of the crops that poor farmers cultivate in less-favored rainfed areas. The social return would be high in the form of less poverty, more food security, and higher productivity.

The alternative to the current dysfunctional system of agricultural input subsidies is not simply to cut back on the subsidies and expect farmers to pay

¹⁷ Rosegrant and Hazell (2000); Ministry of Finance (2002); Gulati (2001).

higher prices for inputs. Rather, input price reform must go hand in hand with institutional reform. In the case of fertilizers, the subsidies permit domestic industry to remain inefficient and noncompetitive. Reform must introduce market forces into the production and marketing of fertilizers, which should lead to lower costs for farmers as protection from import competition is removed. In the case of water and power subsidies, the public supply agencies need to become much more transparent and accountable in their operations. As it stands, these monopolies lack incentives to improve the quality of service and the resources to maintain and enhance infrastructure. Institutional reform may be achieved by engaging agricultural water and power users directly in operations, maintenance, and expansion of water and power systems. Such a participatory approach can make short-term price increases due to removal or reduction of subsidies more palatable, and are likely to facilitate improvements in the quality of service. Increased input prices that reflect true costs offer farmers incentives for better management of inputs and natural resources.¹⁸

Likewise, substantial reforms are needed on the output side. Trade liberalization since 1991 has reduced the protection of Indian agriculture from international competition, and controls on the movement of grain have eased. But much remains to be done. Further liberalization of domestic output markets will have to be coupled with enhanced social safety nets, so that rising input prices do not undermine the livelihoods of poor farmers, and uncontrolled grain prices do not hurt poor consumers (many of whom are themselves farmers). It would be helpful to decouple procurement prices from support

¹⁸ Gulati and Narayan (forthcoming).

prices, which are aimed at assuring that farmers are able to at least meet the paid-out cost of production. While the government should continue to set the latter prices, TPDS should procure its grain from private grain traders at market-determined prices. The Food Corporation of India should limit its publicly-held grain stock to the minimal level needed to respond to the threat of famine and to stabilize prices in the case of a true emergency situation, e.g., 10 million metric tons, plus what is needed to run the TPDS, rather than 60 million tons. The controls on the movement and private stocking of some agricultural commodities (food grains, edible oils, cotton, and sugar) prevent the development of an integrated national market. Repeal of the Essential Commodities Act, or limiting its use to times of national emergency, would encourage private investment in storage and handling facilities.¹⁹

Reduction in input subsidies will free up public funds that can be used instead for investment purposes. Research at IFPRI and elsewhere has suggested a number of priorities for the government to pursue in public investment in agriculture. Since the 1980s, the high cost of subsidies has crowded out such public investment, which grew at an average annual rate of 15 percent in the 1970s, 5 percent in the 1980s, and just 1 percent in the early 1990s. Private investment has not filled in the gap, and is generally not targeted in areas that contribute to poverty alleviation. We have carried out a study of a variety of public investment expenditures in agriculture and rural development: research and development, irrigation, rural roads, education, power, soil and water, rural community development, and health, using state-level data from the period 1970-93.

¹⁹ Gulati and Hoda (forthcoming).

We assessed different types of expenditure for their impact on growth and poverty reduction. We found that expenditures on roads and agricultural R&D are the major “win-win” strategies, with high impacts on both growth and poverty reduction. In addition, education expenditure has a significant impact on poverty reduction, because it leads to increases in rural employment and wages. While irrigation expenditure is important for growth, it has little impact on poverty reduction. All of the other forms of expenditure have lesser impacts on either growth or poverty.²⁰

Another IFPRI study lends additional support to the need for investment in agricultural research oriented toward poor farmers and education, with an emphasis on full enrollment of girls as well as boys. We found that the biggest single factor in reductions in child malnutrition globally during the period 1970-95 was female education. Female education and improvements in food availability combined accounted for nearly 70 percent of the gains in child nutrition.²¹

A third study that we have carried out shows that for every type of public investment studied, the highest marginal impact on agricultural production and poverty alleviation occurs in India’s rainfed areas rather than in irrigated areas. Investment in high-yielding crop varieties, roads, and private irrigation have the highest production and poverty impact in less-favored rainfed areas.²² Hence, the bias against public investment in these areas is not sound agricultural development policy.

²⁰ Fan, Hazell, and Thorat (1999); Hazell (undated).

²¹ Smith and Haddad (2000).

²² Fan and Hazell (2000).

Nor is the bias in favor of food grains appropriate in the circumstances of serious overproduction. Overall economic growth and rising middle-class affluence has increased domestic demand for livestock products, particularly milk and milk production, as well as fruits, vegetables, flowers, and vegetable oils. This means new opportunities for farmers to diversify and specialize. If poor farmers are to have a chance to benefit from these opportunities, then investments are needed in poorer regions in roads, transport, electricity, improved crop varieties, disease control, refrigeration, communications, and food processing and storage.²³ As I have just noted, these investments promise a substantial boost to economic growth at the same time that they contribute to equity and poverty alleviation.

Smallholder farmers often are more efficient at producing many labor-intensive livestock and horticultural products than are larger operations, but they need to have organizations that allow for efficient marketing and access to inputs. India's experience with milk marketing cooperatives shows that they can permit poor people, including landless laborers and women farmers as well as smallholders more generally, to participate in new economic opportunities such as the "White Revolution." Co-ops could likewise assure that small farmers and other rural poor people can gain from expanded horticulture and floriculture production for domestic and international markets.²⁴ At the same time, co-ops and farmer and community associations that are run in a democratic and accountable manner can amplify the political voice of rural poor people.

²³ Hazell (undated).

²⁴ *Ibid.*

Eliminating protective policies that keep domestic agroindustry, particularly oilseeds processing, uncompetitive with imports would also open up new opportunities for production of greater value-added products. Indian oilseed farmers are already quite efficient and productive, and much of the output comes from the country's less-favored semi-arid tropics. The domestic processing industry needs to become similarly competitive. Removal or reduction of taxation of agricultural processing firms would help develop this industry. Reservation of groundnut and rapeseed-mustard processing to small-scale industries is well-intentioned in attempting to assure that smaller entrepreneurs have opportunities, but it has prevented the industry from capturing economies of scale and cutting costs to become competitive with imports.²⁵ As larger, higher value-added enterprises develop, it is important that equitable contracting arrangements and other mechanisms allow smallholder farmers to capture a fair share of the benefits from oilseed sector growth. Such enterprises can also create new higher wage rural employment opportunities.

The transition to a more market-oriented agricultural policy will need to be accompanied by reform of safety net programs. Some of the largest, notably ICDS and TPDS, presently fail to reach large numbers of poor and nutritionally vulnerable people. The programs would be greatly enhanced by better targeting based on income levels and nutritional need, coupled with community participation in program design and management so that intended beneficiaries feel a sense of ownership.²⁶

²⁵ *Ibid.*; Gulati and Hoda (forthcoming).

²⁶ Allen and Gillespie (2001).

THE ROLE OF SCIENCE AND TECHNOLOGY

Science and technology, if applied within a framework of appropriate policies, can do a great deal to advance food security, agricultural growth, equity, and sound natural resource management. Technological change frequently is risky. Thirty-five years ago, India took bold steps to make sure that it could indeed feed itself. Thanks to visionary leadership from policy makers like Agriculture Minister C. Subramaniam and agricultural scientists like M. S. Swaminathan and Norman Borlaug, India launched its Green Revolution, making investments in irrigation and providing farmers in irrigated areas with access to high-yielding rice and wheat seeds, fertilizer, and pesticides. Initially there was skepticism about whether the technology would mostly benefit richer farmers who enjoyed good access to inputs. In fact, the benefits were widely shared. Between 1970 and 1995, while India's population increased by 67 percent, cereal production grew by 88 percent. Dietary energy supplies per person rose 15 percent, so that by 1995, there was enough food available for every Indian to meet her or his minimum calorie needs, if the food were distributed according to need.²⁷ And indeed, the proportion of Indians who are chronically undernourished fell from 38 percent in 1980 to 23 percent today.²⁸ Rural poverty declined from over 50 percent in the mid-1960s to 27 percent in 2000.²⁹ Small-scale farmers as well as larger producers gained from increased yields and lower unit costs of production due to their having adopted the new agricultural technology. Landless rural people found new employment opportunities on and off the farm, and consumers benefited from substantially lower food

²⁷ Asian Development Bank (2000).

²⁸ FAO (1999, 2001).

²⁹ Fan, Hazell, and Thorat (1999); Planning Commission (2002).

prices. Agricultural growth stimulated growth throughout the economy, as rural demand for goods and services grew with rural incomes.³⁰

India has developed an impressive public agricultural R&D system at both the Central and state levels. Yet the country seriously underinvests in public agricultural R&D: spending only accounted for 0.5 percent of agricultural GDP in the 1990s, compared to 1.5 percent for all developing countries and 3 percent in the United States. Public agricultural research needs to focus more on addressing the problems of poor farmers and regions, as larger farms and better off regions are likely to attract private research investment.³¹

Public agricultural R&D should focus on development and dissemination of technologies and natural resource management practices that are environmentally sound. Some of these technologies already exist and include precision farming, crop diversification, integrated pest management, pest resistant crop varieties, and improved soil and water management practices. Some of these, if managed appropriately, can increase yields at the same time that they reduce natural resource degradation. More research is needed to create more technology options for poor farmers. Conventional and molecular biology-based approaches to research should be used to develop pest- and disease-resistant and drought- and salt-tolerant crop varieties that do not depend on application of chemicals. In dryland areas, diseases and pests often wipe out the groundnut, pigeon pea, and cotton crops upon which smallholders depend for their livelihoods.³² Agricultural

³⁰ Hazell and Haddad (2001).

³¹ Hazell (undated); Gulati and Hoda (forthcoming).

³² Hazell; Paarlberg (2001).

researchers must work in close partnership with farmers, and draw on the insights of indigenous knowledge. Farmers in India's semi-arid tropical zones, for example, have on their own devised approaches to soil conservation, and this knowledge could be integrated into research programs aimed at sustainable intensification of agriculture in these resource-poor areas.³³

Today, India again must choose whether to adopt new agricultural technology that many critics consider risky. Contentious public debate over the environmental and socio-economic risks of modern agricultural biotechnology have meant long delays in approval of the commercial release of genetically modified crops in India. Last month, the government's Genetic Engineering Approval Committee granted permission to Indian farmers to grow genetically modified cotton commercially, four years after the first field trials.³⁴ Extensive research on additional applications of modern agricultural biotechnology is underway both through the public Indian Council of Agricultural Research (ICAR) and the domestic and international private sector. Opposition has centered primarily on the involvement of foreign companies, such as Monsanto, in efforts to commercialize genetically modified cotton. While Monsanto was trying to get approval for commercialization of insect-resistant cotton in India, it was also trying to acquire the U.S. patent on genetic use restriction technology that renders second generation seeds sterile, i.e., the so-called terminator gene. Although Monsanto ultimately agreed not to commercialize the latter technology, concern about sterile seeds was

³³ Kerr (2000).

³⁴ *Crop Biotech Update* (2002).

another major factor in opposition to the cotton from Indian nongovernmental organizations.³⁵

Despite the antagonism toward genetically modified cotton in India, use of similar cotton seeds (containing genes from the soil bacterium *Bacillus thuringiensis*, or Bt, that produce a toxin that kills the cotton bollworm) in China has had significant benefits. It has reduced synthetic pesticide use on cotton farms dramatically, lowered labor costs, increased profits, reduced collateral damage to non-targeted species and water pollution, and, importantly, dramatically reduced pesticide poisoning cases among farmers and agricultural laborers.³⁶ In South Africa, Bt cotton has led to substantial yield increases where it is commercially available.³⁷

Since ICAR research is funded by Indian taxpayers, not foreign companies, and focuses on the needs of poor farmers and consumers (e.g., high protein and insect-resistant rice varieties, as well as insect-resistant cotton, oilseed crops, and potatoes), often in collaboration with public international agricultural research centers such as the International Rice Research Institute and the International Crop Research Institute for the Semi-Arid Tropics, there is reason to hope that some of the results of this research will find its way into farmers fields sooner rather than later. As is a necessity before commercial introduction of genetically modified crops can take place, India has already developed an impressive capacity to assess and manage risks to human health and environment, through inter-ministerial bodies including officials charged with responsibility for environmental protection, agriculture, health, and science and

³⁵ Paarlberg (2001).

³⁶ *Ibid.*

³⁷ Njobe-Mbuli (2000).

technology, along with university scientists. This capacity is adequate to address legitimate biosafety concerns with respect to biotechnology.³⁸

Slow progress in enacting intellectual property rights legislation relating to plant varieties has impeded both private sector research and commercialization of domestic and imported seeds derived from biotechnology. The recent passage of the Protection of Plant Varieties and Farmers' Rights Legislation by the Parliament creates an intellectual property regime that may serve as a model for other developing countries to meet their obligations under the World Trade Organization (WTO) and the new International Treaty on Plant Genetic Resources for Food and Agriculture. It seeks to balance the need to offer incentives for innovation to private plant breeders with provisions on benefit sharing for individual and community holders of traditional knowledge and on the rights of farmers to save and exchange seeds.³⁹ Such a system should be effective in promoting both agricultural innovation and the equitable and sustainable management and conservation of India's agricultural biodiversity.

R&D should also focus on improving poor rural people's access to India's well-developed information and communications technology. The development of wireless broadband can greatly expand access to telephones and the Internet in poor rural communities. Using a hub-and-spoke approach, one village with full Internet access can disseminate information and receive requests from other villages that have wireless access to the hub, thereby saving on costs. Digitized radio broadcasts via satellite can

³⁸ Paarlberg (2001).

³⁹ Ministry of Finance (2002); Ramanna (2002).

now cheaply reach large numbers of people. These technologies offer poor rural dwellers vastly improved access to timely market information, awareness of relevant government policies, and access to new agricultural know-how. Information flows at a greater speed, and has far broader reach, than via traditional brick-and-mortar agricultural extension. This can contribute to higher incomes for poor farmers and nonfarm rural poor people engaged in handicraft production, with positive impacts on household food security and nutritional status. For poor Indian fisherfolk, cell phones already make it possible to compare prices in different markets for their catch. Technologies aimed at collecting geographically referenced data can be enormously useful in food security research and policy making, e.g., improved targeting of safety net programs and famine early warning.⁴⁰

MAKING GLOBALIZATION WORK FOR POOR PEOPLE

Many food security and poverty reduction advocates are concerned that agricultural trade liberalization will hurt poor people, as larger-scale producers come to dominate export crop opportunities and cheap imported produce from developed countries (often produced and exported with heavy subsidies) wipes out smallholders.⁴¹ Most analysts agree that globalization is presently occurring in a highly inequitable context and under rules that have biases against poor people and countries. However, many would argue, in contrast to the above concern, that if governments in developed and developing countries undertake appropriate policy changes,

⁴⁰ Chowdhury (2001).

⁴¹ See, for example, WTO Watch (2002).

globalization *can* be made to work for poor and hungry people.⁴²

In the case of Indian agriculture, most domestically produced commodities enjoy comparative advantage on the home market, and many are competitive, or could become so, in global markets. These advantages can, moreover, be enhanced to the benefit of poor rural people with appropriate policies. However, much depends on the willingness of developed countries to open their markets to developing country products, reduce tariff escalation against higher value commodities and processed goods, and reduce trade-distorting subsidies on their domestic agriculture and exports. India is playing a very prominent role as a leader of the developing countries in the current round of global agricultural trade negotiations through the WTO. By putting “food and livelihood security” on the table as a “non-trade concern” to be addressed in the negotiations, India has helped to steer the discussions toward a clearer focus on the potential impact upon poor people.

There are varying patterns of domestic and international competitiveness among India’s major agricultural products. Despite the controls and regulations on food grains, research has shown that Indian rice and wheat are very competitive with imports, particularly since the productivity gains of the Green Revolution resulted in real price declines. Moreover, since the mid-1990s, India has become a major rice exporter, as domestic prices have been below or equivalent to world prices. Indian rice is likely to remain competitive, especially in Asian markets, given lower freight costs in comparison to the

⁴² See, for example, Diaz-Bonilla and Robinson (2001).

United States. In contrast, India has only made modest exports of wheat in recent years, despite the large surpluses on hand, as domestic prices remain above world prices. Indian cotton is likewise competitive vis-à-vis imports, and seems likely to be competitive on export markets as well. Although neither unprocessed Indian oilseeds nor processed edible oils are competitive in domestic or global markets, deregulation of the edible oils processing industry to allow scale economies might change this. The dairy sector is strongly competitive in the growing domestic market vis-à-vis imported products, but does not seem likely to fare well in highly distorted global markets. India has long enjoyed a strong position as an exporter of tea, coffee, spices, cashews, jute, and tobacco, although the prices of some of these commodities are too low to make expansion of production worthwhile. In the 1990s, India has increased its exports of both fresh and processed fruits and vegetables, but further expansion will require improvements in infrastructure, storage, transport, processing, and the ability to meet sanitary and technical requirements in developed country markets. The same applies to fish exports, where there is also potential competitive advantage.⁴³

The liberalization of the industrial sector after 1991 improved the terms of trade between agriculture and manufacturing, and spurred private investment in nongrain agriculture, particularly in horticulture products, livestock products, and fisheries. Beginning in 1994, trade liberalization was extended to agricultural products. However, grain, oilseed, and edible oil imports have remained subject to protection. Agricultural exports of most products are much less restricted than imports.⁴⁴

⁴³ Gulati and Hoda (forthcoming).

⁴⁴ *Ibid.*

If India remains hesitant about completing the liberalization of agricultural trade, it may lose out on opportunities that globalization offers while facing some very real risks. Now that China has joined the WTO and is deepening its engagement with globalization, the biggest risk for India may be getting left behind.

The completion of economic reforms in agriculture that I outlined earlier would not necessarily focus on exports. India has a very large domestic market, and many domestically produced products are already very competitive on that market. Nevertheless, appropriate investments and institutions could enhance the export competitiveness of Indian agriculture. As in the domestic market, whether or not enhanced export opportunities will benefit smallholders depends on whether they have access to infrastructure (especially all-weather roads and storage facilities), inputs, credit, and markets.

Unless developed countries are willing to open their markets to temperate-zone agricultural exports from developing countries and end tariff escalation against processed and higher value products, however, the benefits that developing countries and the poor people who live in them will derive from globalization will be limited. In addition, India faces high tariff barriers in some developing country markets for such key exports as mangoes, tea, and cashews.

If developed countries want developing countries to continue to open their markets for agricultural products and other goods and services, they must in turn reduce the substantial subsidies provided to developed country farmers. Global

agricultural subsidies total US\$360 billion annually, or nearly a billion dollars a day, of which 80 percent are in OECD countries. A large number of developing countries are among the 140 members of the WTO, so agricultural trade negotiations can no longer boil down to discussion among the United States, the European Union, and Japan. The Cairns Group of non-subsidizing agricultural exporting countries, which includes both developed and developing nations, played an important role in the Uruguay Round agricultural negotiations in the 1980s and 1990s, and may have an even more pivotal role in the current talks. A coalition including the Cairns countries and developing countries with large agricultural sectors, such as India and China, would be particularly well-placed to challenge the current distorted patterns of global agricultural trade. The developed countries cannot expect the developing world to endorse one-sided trade agricultural trade liberalization *ad infinitum*.

In 2001, India proposed that the concept of “special and differential treatment of developing countries” in the WTO agreement should recognize the need for developing countries “to tackle their special concerns such as food and livelihood security while reforming agricultural trade.” The African group has similarly proposed that trade liberalization take into account “such non-trade concerns as food security, sustainable development, and poverty alleviation.”⁴⁵ Given the importance of agriculture in the economies of the poorest developing countries, particularly in Africa, and its potential to drive poverty reduction, it is clear that some balance between complete trade liberalization and an ability to promote and protect domestic agriculture without violating WTO rules will be needed for some time to come.

⁴⁵ WTO (2002).

In India's case, however, the country can take the measures needed to achieve food security under the existing WTO rules affecting developing countries. Such measures include input subsidies and product specific price supports up to the level of 10 percent of the value of production. But reform of input subsidies would serve to advance food security more than maintaining them in their current form. The policy agenda that I have laid out earlier, including programs to invest in human resources, improve safety nets, and invest in public goods, such as agricultural research that will increase poor farmers productivity and reduce their risks, is likewise permissible under the existing WTO agriculture rules. India's remaining barriers to agricultural imports, particularly high tariff barriers to imported cereals and edible oils, do not advance food security much. Indian cereal production is sufficiently competitive domestically not to require high protection. While further investment and policy reform is needed to expand domestic edible oil production capacity, Indian consumers, and especially poor consumers, would benefit from liberalization of the import market for edible oils.

CONCLUSION

Agriculture will remain an important source of livelihood for large numbers of Indians, either directly or indirectly, for a long time to come, as a majority of the workforce remains engaged in farming and related work. Moreover, most poor Indians live in rural areas, so broad-based agricultural growth must be at the center of strategies to reduce poverty and achieve food security.

In order to achieve this, food and agricultural policy must shift from poorly targeted subsidies to a

focus on investment – with an emphasis on human resources, public goods, and meeting the needs of poor people and regions. Key investment targets include less-favored areas, agricultural research, infrastructure (especially roads and storage), and education, for girls and boys alike. Agricultural research must make use of all relevant tools, including molecular biology, conventional approaches, and better utilization of farmers' own knowledge, to help meet the needs of poor farmers and regions. Alongside these public investments, agriculture should become more market oriented, with better targeted safety nets to assure that the transition from controls and subsidies does not leave poor people worse off. Safety net programs and agricultural and rural development programs alike need to be designed and implemented with the participation of the intended beneficiaries, rather than in a top-down bureaucratic manner. Agricultural policy also needs to shift from the heavy emphasis of the past on food grains to more diversified and higher value added activities. Much greater attention must also be paid to sustainable use of natural resources.

Globalization can be shaped to benefit poor people. The needed shifts in domestic food and agricultural policy would go a long way to assuring that smallholders and other rural poor people have a stake in export opportunities, namely assuring them access to infrastructure, inputs, credit, markets, and organizations such as cooperatives that can facilitate their participation in markets and enhance their political voice. But these shifts will fall short of achieving what is needed unless the developing countries and their allies can also convince the developed countries to reduce their barriers to developing country exports and other trade-distorting policies.

I am pleased to note that in his 2002-03 budget speech at the end of February, the Honorable Minister of Finance, Shri Yashwant Sinha, has proposed a number of steps in the appropriate direction, including more public investment in agricultural research, a review of the governance of research institutions, more funds for cold storage facilities and all-weather rural roads, and expansion of agricultural credit.⁴⁶ The government is to be commended for directing additional funds to agricultural and rural development under difficult fiscal circumstances. The budget deficit continues to claim a big chunk of GDP, and the delicate national security situation means that defense will receive a substantial budgetary allocation at a time when resources are scarce. But further progress along the road of food and agricultural policy reform is urgently needed to assure that all Indians enjoy sustainable food security.

⁴⁶ Government of India (2002).

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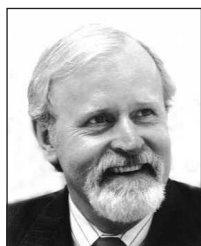
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