

A visit to India's granary: Parson Malthus refuted

by Susan Brady, Agriculture Editor

The most advanced outpost of modern agriculture in India lies in the states of Punjab, Haryana, and western Uttar Pradesh, located in the area in northern India between the Pakistan border and the Himalayan mountain range. During a visit this summer I had the opportunity to see the region, talk with state agriculture officials and officials at the agricultural university, and meet with specialists in various disciplines at the Indian Agricultural Research Institute in New Delhi; I gained some insights into how the world's most populous democracy gained basic food self-sufficiency.

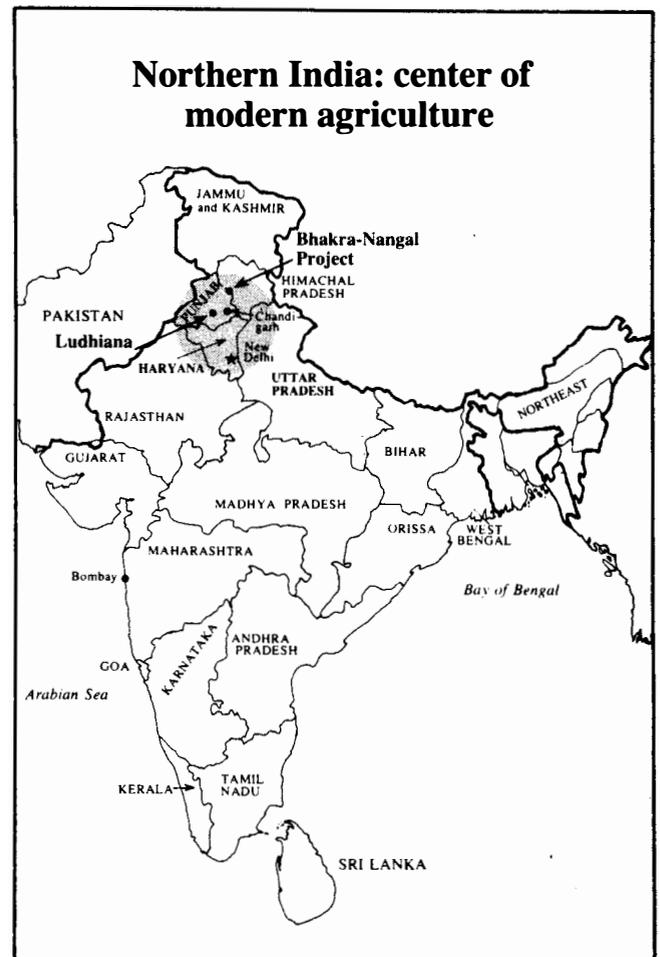
What I found shatters several important myths, first and foremost that of the inevitable "basket-case" condition of developing nations. India's agricultural modernization, a program premised on industrialization and agricultural science, is a model for every developing nation today. Were it reported on more widely and honestly, India's achievement since Independence would have contributed mightily to discrediting zero-growth and anti-technology advocates who have blocked progress in both the advanced and developing sectors.

There is another myth associated with such magical images as "miracle seeds" and "green revolution." As any American farm-producer knows and as I saw demonstrated plainly in India, there is in reality no miracle in the "miracle seeds"—the hybrid and high-yielding varieties. The individual farmer must have both the knowledge and the industrial technical resources to make them work. That in turn requires the kind of planned industry-vectored economic and social development that the World Bank-IMF strategists and the free-marketeers have teamed up to outlaw in developing nations.

The lay of the land

The road from New Delhi to Chandigarh and Ludhiana where Punjab Agricultural University, one of the three keystone "land-grant colleges" of India, is located, is lined with small, neatly tended fields that stretch across the flat land as far as one can see. Paddy transplanting of the rice crop was in progress as we drove through, and many of the fields were inundated.

As nowhere else in India, more than 85 percent of Punjab's cultivated land is under irrigation. The myriad canals, part of the old 19th-century Upper Ganga Canal System and the modern, post-Independence Bhakra-Nangal Project (the spectacular multi-purpose dam India's first Prime Minister Jawaharlal Nehru called India's "Temple of Progress" when he dedicated it in 1963), are supplemented massively with



plentiful groundwater supplies that lie just 35 feet below the surface.

The fields on either side of the road are dotted with tiny pump houses, which with a couple of trees form shady hubs, centers of activity and work, at intervals across the terrain. Most of the pump houses have electric lines running to them; a tractor is usually nearby, and when the electric power is cut, the farmer hooks up the diesel tractor engine to the pump. Not infrequently one also sees ancient bullock-powered water-lifting devices. All around the carefully fashioned paddy plots, the soil is parched and lying fallow in the 110-degree dry heat, waiting for the monsoon rains that were almost a month late at the time of our visit.

The Kharif campaign

In Punjab every crop is approached as a campaign, an organized mobilization to reach a set of goals. The Kharif Crop Campaign had just been launched, and despite the late monsoon, no one was predicting disaster. (Though there are three-and four-crop annual cropping patterns, *rabi* and *kharif* are the two main crops, analogous to winter and spring crops in the United States, and featuring predominantly wheat and rice respectively.)

During the preceding kharif season, rice production in Punjab had reached a new high of nearly 4 million tons. Once again, Punjab was the largest contributor to the National Food Reserve, an 18-million-ton stockpile the Indian government maintains, contributing 50 percent of the rice from the entire country. The newly harvested rabi wheat crop was expected to set a new record at 8.5 million tons, despite damaging unseasonal rains in April and May.

This was all outlined in the kharif campaign packet Punjab Agriculture Director Mukhtiar Singh gave us. "Massive Kharif Campaign Launched," the packet, which goes to every farmer and agriculture worker in the state, was headlined. The aim: to put nearly 1.2 million hectares in Punjab under high-yielding varieties of paddy, and make an all-out effort to boost per-unit productivity to maintain the nearly 4-million-ton production levels of 1981. As the written campaign materials detailed, plans had been made to assure the provision of sufficient quantities of fertilizers and pesticides, as well as diesel power and canal water, during the growing season. A system of short-term crop loans had been arranged to help farmers procure inputs. The Punjab State Seed Corporation had marketed a record amount of certified paddy seed, as well as maize, cotton, and pulse seed. The latter had increased threefold over a year earlier, in line with the government's push to bring down the country's edible-oil import bill.

We had a chance to spend some time with Mukhtiar Singh, a turbaned Sikh with a full white beard and commanding presence. How does it work? we asked him.

Education, backed up with a package of inputs—including everything from seed to fertilizer, pesticide, water, and credit, Director Singh told us, is the key to Punjab's agricul-

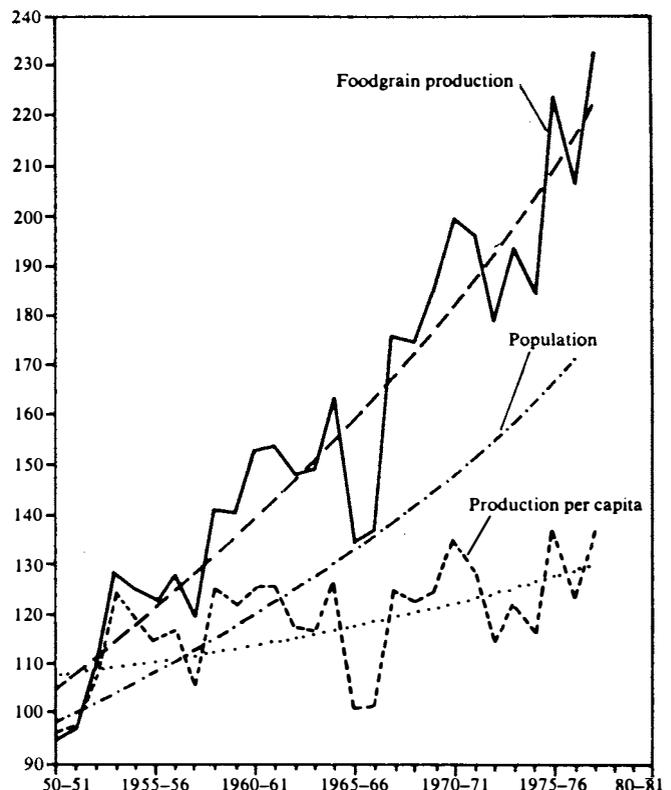
tural success. The Department operates a very active and far-flung extension program. Agents and organization are provided at the district and even block level, and, with the collaboration of the Punjab Agricultural University, constant contact and consultation are maintained with the individual farmer.

Each crop campaign is organized around a program that specifies targets for the crops, as well as projections of production cost and income, so that farmers can plan their individual planting pattern. Kits lay out the latest recommendations and techniques for most effectively raising each particular crop. During a campaign, before and during planting, a series of educational meetings draws in farmers, first at the district and then the block and even village level: the program is outlined, the latest research results are presented for practical application, plans and approaches are discussed, and problems identified.

The leadership abilities of state officials, and the effectiveness of their coordination with the university researchers

Figure 1
Major economic indices for India,
1950-51 to 1977-78

1950-51 to 1952-53 = 100



Source: *Food Trends and Prospects in India*, Fred H. Sanderson and Shyamal Roy, The Brookings Institution, 1979.

and farmers, stand out as a determining factor in whether production breakthroughs will be made and how fast. Director Singh continues a strong tradition in this regard, established by Punjab's first Chief Minister, Pratap Singh Kairon. It was Kairon who led "East Punjab," deprived of its best lands and most of the water-resource development by the 1947 British Partition, from a ravaged and food-short area to one of the pillars of the independent Indian nation. An engineer by training, Kairon had visited California and carefully observed the American system of agriculture. He worked closely with Jawaharlal Nehru to establish the land reform and lay the institutional and industrial basis for the tremendous strides Punjab took once the modernization policy was adopted in New Delhi in the early 1960s. In the 20 years from Independence until 1971, wheat yields in "East Punjab" tripled, while in Pakistan's "West Punjab" they remained stagnant.

Not everything is perfect in India's showcase granary. Power is the major concern, Director Singh told us, describing the status of Punjab's several-year-old request for a nuclear power plant in this mineral-resource-poor state. The overall power shortage, despite the fact that Punjab has the highest per capita energy consumption of any state in India

at 314 kilowatt hours per year, and the immediate needs of agriculture continue to force a complete shutdown of industries in some parts of the state, and power shutdowns for industry lasting 8 to 10 hours a day in other parts. Forced stagnation or decline in the industrial sector will quickly undermine agricultural production itself. The news, while we were there, that the power shortage had brought two fertilizer plants to a grinding halt is a case in point of the potentially disastrous longer-term consequences of short-term "adjustments."

Punjab's power crisis highlights the intimate interdependence between agriculture and industry. As IARI Director Dr. H. K. Jain explains in an interview published in *EIR* last week, *modern agriculture is essentially the extension of industry*, a fact obfuscated by ruralists in India and the rest of the world who intend to enforce the backwardness of traditional agriculture. As Dr. Jain emphasized to me, he is often surprised at the extent to which this is ignored or perhaps forgotten even in America, widely hailed as the epitome of "modern agriculture."

India's approach to marketing and pricing

The connection between agriculture and industry, which American System economist Henry Carey had insisted upon in the 1850s against Britain's proponents of "ground-rent" economics, came up again in a surprising context: farm prices. Knowing the severe problems American producers face in the below-parity prices of the so-called free market, I was curious about how India handled marketing and pricing.

What I found is that in the tradition of the early "American System," the Indian government takes responsibility for ensuring orderly marketing of farm products at fair prices. The major buyer is the Food Corporation of India (FCI), which stocks the National Food Reserve and runs "fair price shops" to ensure full distribution of grain supplies throughout the country as a whole. A small margin of grain is handled at premium prices through private trade, but the private traders are only interested in superior-quality grains. FCI enforces the prices set for the major crops by the Agricultural Price Commission on the basis of cost-of-production estimates and related considerations. Farmers think the prices are too low, and most agriculture officials agree, viewing the problem as a result of the slowed overall pace of industrialization in the country, a slowdown which has correspondingly slowed market expansion.

The first boost to Indian agriculture—long before the "miracle seeds" were brought from Mexico in 1963—was the commitment to build up basic industry and infrastructure as rapidly as possible established in the Second Five-Year Plan. It was attacked at the time by World Bank circles as "biased against agriculture." But since Independence, food production has increased steadily—from 50 million tons in 1950, to 100 million tons in 1970, and to the record 134 million tons in 1980 (see Figure 1).

In 1950, India produced 39,000 tons of nitrogenous fer-

Figure 2
Average yield trends, wheat and paddy, 1961-77

	1961-65 (Kg per hectare)	1977-78
Wheat		
World	1,205	1,600
Canada	1,379	1,822
Mexico	2,085	3,757
Argentina	1,534	1,477
China	882	1,270
Pakistan	833	1,475
Australia	1,227	881
U.S.S.R.	964	1,429
U.S.A.	1,700	2,046
India	835	1,394
Punjab	1,238	2,537
Paddy (unhusked)		
World	2,035	2,443
China	2,780	3,325
Japan	5,012	6,166
Burma	1,642	1,839
Bangladesh	1,680	1,796
India	1,480	1,873
Punjab	1,500	4,365

Source: *Punjab Agriculture*, Punjab Public Relations Department, November 1979.

tilizers; by 1970, fertilizer production had increased sixfold to 1.24 million tons, while consumption jumped eightfold to 2.56 million tons. Today, both production and consumption have more than doubled once more, and India has emerged as the world's fourth largest producer and consumer of nitrogenous fertilizer.

Moreover, from 1956 to 1971, the number of tractors in India doubled. In terms of the other critical input for modernization—water—in 1950, a total of 22.6 million hectares were under irrigation, mainly by surface water. By 1980, more than 50 million hectares had been brought under irrigation; surface water irrigation nearly doubled, and groundwater irrigation nearly quadrupled.

Even in the worst years for Indian agriculture, when India was forced to import grains in some quantity, at no time did grain imports ever amount to more than 5 percent of the country's food supplies. But while the overall production achievements correlate with scientific and industrial benchmarks, the process of agricultural modernization has been uneven across the country.

The states of Punjab and Haryana (and, to a much lesser extent, western Uttar Pradesh) supply all the surplus food grains for government procurement. No other state produces an appreciable marketable surplus. Crop yields in Punjab are uniformly at least double the all-India average, and rank favorably on an international scale (see Figure 2). Fertilizer use per hectare in Punjab is the highest of any state, at an average of 113 kilograms per hectare as of 1980-81. Next in line is Haryana, whose fertilizer consumption corresponds to the all-India average, at about one-third of the Punjab level. At the other end of the scale is Rajasthan, at about 11 kg. per hectare.

Similarly, Punjab has the most extensive irrigation, with the highest percentage of net irrigated area to net cultivated area of any state, and more than three times the all-India average of 27 percent. With Haryana, Punjab has the highest percentage of area under high-yielding varieties of wheat and rice. Likewise, doubling of tractorization in India between 1956 and 1971 was most accounted for by the expansion of tractor use in these two states

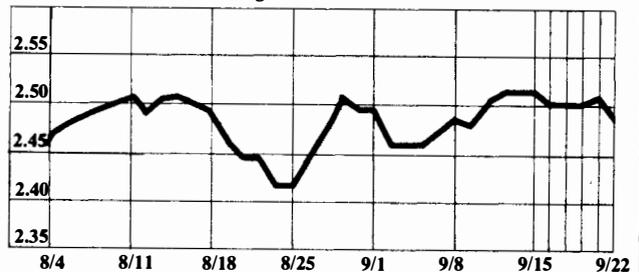
India could feed the world

The basis for extending the achievements won in Punjab and Haryana has been carefully laid in the research and extension infrastructure in each state, and as Dr. Jain emphasized, significant progress is already being made. In some cases major capital investments are underway or in the planning stage. The vast Gangetic Plain of Uttar Pradesh, now menaced by problems of flood control and climatic instability is potentially capable of feeding the entire world. In the west, the great Rajasthan Desert awaits greening with the completion of the huge Rajasthan Canal Project. The canal, one of the largest of its kind in the world, was initiated in 1958 and when completed, will bring more than 1 million hectares of land under irrigation.

Currency Rates

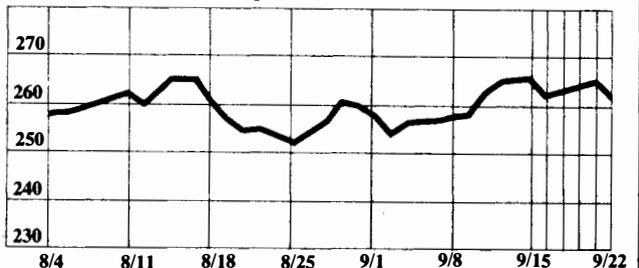
The dollar in deutschemarks

New York late afternoon fixing



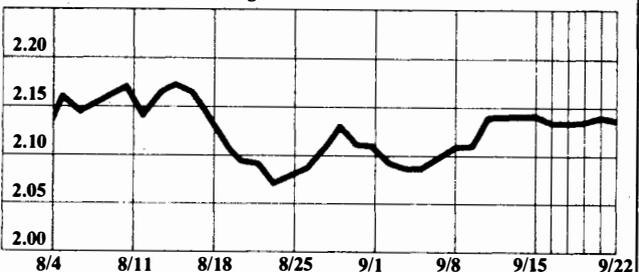
The dollar in yen

New York late afternoon fixing



The dollar in Swiss francs

New York late afternoon fixing



The British pound in dollars

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