

Food production in Pakistan: an area of growing concern

by Ramtanu Maitra

Over the years, Pakistan's food production has gone through periods of crises. Bestowed with an irrigation system which was superior to that in any part of India, Punjab and Sind provinces of Pakistan were producing bountiful food, and Pakistan was a food surplus nation at the time of partition of the Indian subcontinent in 1947. But less than two decades later, Pakistan had become a food-importing nation dependent largely on the U.S. government's PL-480 program.

In spite of the "green revolution" and subsequent rise in food production, and to a certain extent productivity, Pakistan's food-growing sector has remained perilously close to insufficiency. In the 1980s, Pakistan's food production kept up with the growing population but could not build up any significant buffer stock. As things stand, the future looks shaky unless a qualitative improvement in the agricultural sector is undertaken forthwith.

Since 1970-71, the year the eastern wing tore away from Pakistan to become the independent nation of Bangladesh, Pakistan's production of major cereals has shown a significant rise (see **Table 1**). During this period, production of wheat rose by 100%, rice by about 50%, and maize by 57%. Unfortunately, however, production did not go up because of enhanced productivity. During this period Pakistan had put under the plow more land which for the most part accounted for the production increase. The sown area in the case of wheat grew by 22%, while 31% more land was used for paddy cultivation and 34% in the case of maize. In effect, the productivity rise over the 18-year period had been less than substantial, and is a major cause for concern.

By the year 2000, as the population growth projection indicates, Pakistan will have at least 25 million more people. To keep them alive, at least 25% more food-grain production at the end of the coming decade will be required. At the same time, a large segment of the population in Pakistan today requires more food, both in terms of calories and nutrition, to be healthier and more productive.

Pressure on land utilization

Pakistan, what was known as West Pakistan until 1971, has a reported arable land area of about 58 million hectares, of which 36% was under cultivation as of 1986-87. According to available reports, about 10 million hectares—about

18% of cultivable land mostly located in Sind and Punjab—have become unusable because of waterlogging and growing soil salinity. Government experts claim that 50% of this "unusable" land can be reclaimed without incurring large expenditures. However, the effort to do that has not yet become visible.

Meanwhile, large tracts of land lying west of the Indus River and belonging to the barren Baluchistan and not-so-barren North West Frontier Province (NWFP) have very little access to water. With a very low annual rainfall, the cost of bringing these lands under productive cultivation will be high. However, proper planning and effective implementation can make both Baluchistan and the NWFP highly productive regions for fruit growing and other low water-consuming agro-products which, in turn, can contribute significantly to local agro-based industries.

The provinces of Sind and Punjab, washed by the Indus and its mighty tributaries—Sutlej, Ravi, Chenub, and Jhelum—will continue to produce the bulk of Pakistan's food supply. Out of 21 million hectares of land under cultivation, cotton is sown in 3 million hectares and sugarcane in 1 million hectares. Major cereals, such as rice, wheat, and maize, account for 10 million hectares. The minor cereals and cash-crops account for the rest of the 15.54 million hectares sown in 1986-87.

In the coming years, as Pakistan's population, which now stands at 102 million with an annual growth rate of 2.5%, grows, the pressure on land will increase. Unless land management planning, which must include highly productive food-grain production schemes, is undertaken right now, Pakistan may fall back to the lean days of the 1960s. The problem is that in the 1960s the world had a substantial surplus of food-grains; according to various projections, there may not be any surplus at all in the 1990s.

Benefits of the Indus Water Treaty

In the 1960s when Pakistan's food-grain production stagnated, the introduction of chemical fertilizers, enhanced irrigation, and the high-yield variety (HYV) seeds succeeded in breaking the logjam, and Pakistan, over the next few years, emerged as a food self-sufficient nation. The Indus Water Treaty between India and Pakistan in 1960 was a major con-

tributor to this success. The treaty provided for sharing of the Indus water through transfers from the three western rivers (Chenub, Jhelum, and Indus) to the three eastern rivers (Sutlej, Beas, and Ravi) through a network of canals and barrages.

The mighty Indus Basin project, one of the world's largest, on the Pakistan side consisted of two major dams—Mangla Dam on the Jhelum River and Tarbela Dam on the Indus—primarily for irrigation purposes. Besides, eight inter-river link canals, five barrages and one gated syphon were part of the basin development. Mangla Dam, with a storage capacity of 0.66 million hectare-meters (mhm) of water, and Tarbela Dam, one of the world's largest earth-filled dams with a storage capacity of 1.14 mhm of water, became the major suppliers of irrigation water. In 1985, the Indus water system provided about 12 mhm of water at the farmgate, while the tubewell system, used for pumping water up from underground aquifers, accounted for another 1.5 mhm of water for irrigation.

In spite of the Indus Basin development and a spurt in the pumped-irrigation system, most farmers in Punjab and Sind make do with about one-third of the water that farmers elsewhere use. According to one expert, Dr. Abdur Rahman, vice-chancellor of Agriculture University in Pakistan, the water shortage results mainly from huge losses occurring in the conveyance system; from canal head to outlet to the tune of 25%; from outlet to farmgate, 15%; and to field another 6%. It adds up to a colossal loss of 46% of the total surface water diverted. According to Dr. Rahman, 4.42 mhm of river water goes unused to the seas.

While ways to hold a significant part of the unused water flowing to the seas must be found, exploitation and recharging of groundwater must be stepped up to meet the increasing water demand with better control. Pakistan's performance in the exploitation of groundwater has been a mixed bag. From a modest beginning in the 1950s, the number of tubewells installed grew steadily at the rate of 6,000 per year, and by 1965 there were 31,000 tubewells. The installation of tubewells rose faster after 1965, and by 1973 the number of functioning tubewells reached 100,000. Although the installation rate slowed down after 1973, the number of tubewells installed continued to rise, and reached the maximum in 1982 when the number of functional tubewells reached 202,158.

Since then, the number of functioning tubewells has been on the decrease. Reasons cited include increasing cost per installation, groundwater becoming saline, lowering of the groundwater level, and lack of pumping power.

Green revolution inadequately exploited

There are two other areas—seeds and fertilizer—that could be taken advantage of to enhance food-grain productivity significantly. When used in conjunction with adequate fertilizer and water, HYV seeds can give a 20% rise in production. According to available reports, only 43% of seeds

for wheat production, 26% for paddy production, and 15% for maize are HYV. By converting the entire foodcrop-seeds to HYV seeds, Pakistan's food-grain production can get a boost in a short time-span. At present, however, Pakistan lacks the institutional strength necessary to undertake a large-scale scientific development in this area.

Compared to the performance with HYV seeds, Pakistan has done considerably better in fertilizer use. Total fertilizer use increased from 283,200 nutrient tons in 1970-71 to 1,783,840 nutrient tons in 1986-87, an increase of about 529% during the period. The consumption of fertilizer per

TABLE 1
Production of major crops
(in thousand tons)

	Year		
	1965-66	1970-71	1986-87
Wheat	3,854	6,374	12,882
Rice	1,296	2,165	3,486
Maize	531	706	1,111

Source: Ministry of Food, Agriculture and Cooperatives, Government of Pakistan

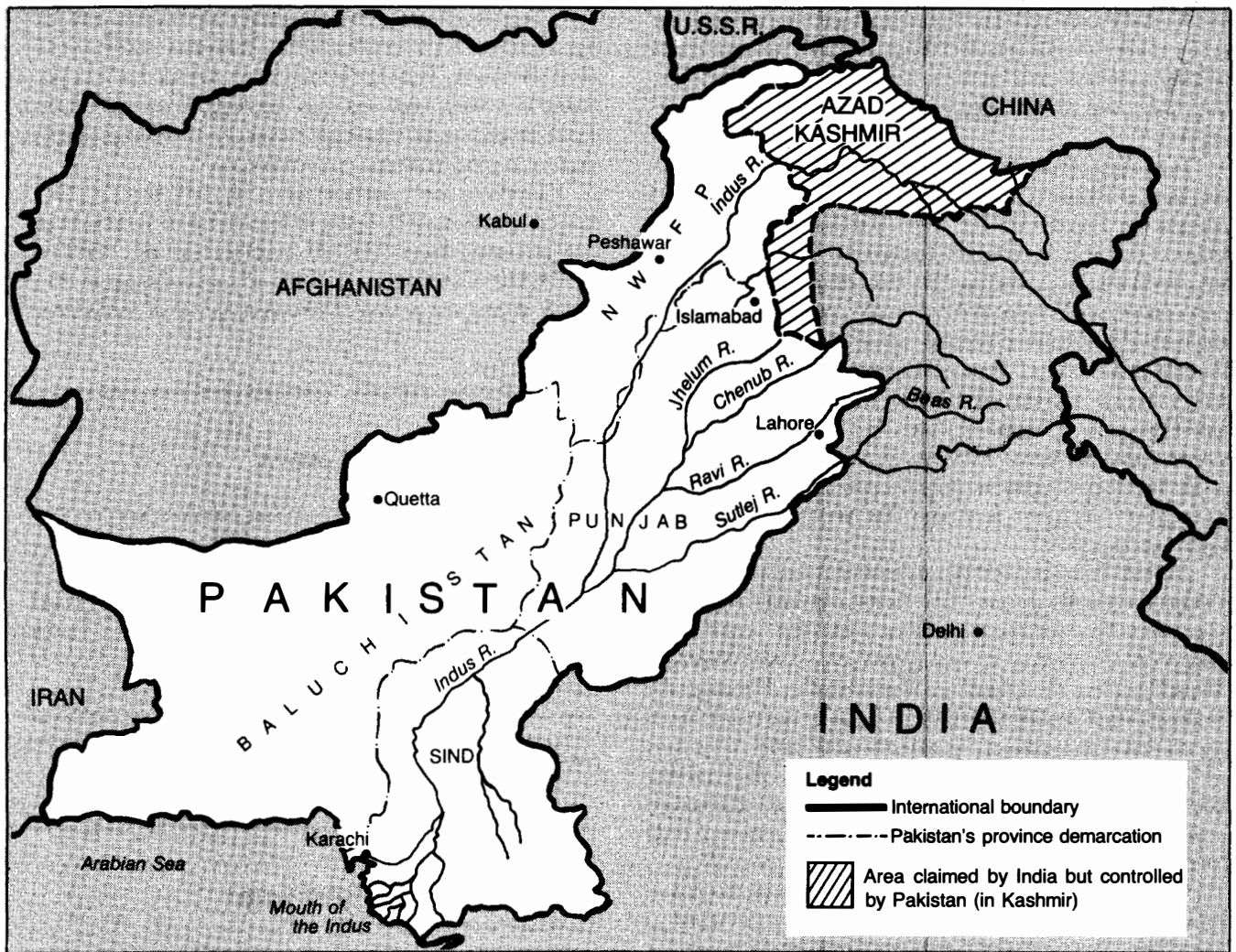
TABLE 2
Area under major food crops
(in thousand hectares)

	Year		
	1965-66	1970-71	1986-87
Wheat	5,157	5,980	6,932
Rice	1,394	1,504	1,968
Maize	542	640	842

Source: Ministry of Food, Agriculture and Cooperatives, Government of Pakistan

TABLE 3
Yield of wheat in 1985

Country	Yield
Pakistan	1.59
India	1.87
China	2.95
U.S.S.R.	1.65
U.S.A.	2.52



cropped hectare rose substantially from 15 to 59 nutrient kilograms—about 20 kilograms more than the average in India. However, it is doubtful whether the Pakistani farmers were able to extract the optimum benefit from increased fertilizer use.

As Dr. Rahman pointed out recently, the proper use of fertilizer is associated not only with the quality of the nutrients itself, but also its judicious use at the proper stage of plant growth. The infrastructural weakness in Pakistan's agriculture, combined with its institutional weakness, is also noticeable in the way fertilizer is used. Farmers, not being aware of vital scientific findings, often use fertilizer without taking into account soil conditions and other parameters.

While the application of the fundamentals of agricultural science will take Pakistan over the crisis that is looming ahead in the coming decade, there are areas where long-term thinking and planning are needed. Since a new government has come to power in Islamabad with the promise of eradicating poverty, Pakistan's long-term agricultural development requires a hard look.

Some constraints

First, the annual flooding and large-scale deforestation, which have led to severe land erosion, need to be given priority attention. Flooding and deforestation are deeply intertwined in the present eco-cycle that is heading for a potential disaster.

Pakistan's floodplains consist entirely of riverine areas located between and on either side of the Indus River system. Some 80% of Pakistan's valuable irrigated land area of 16.6 million hectares is located in this riverine tract. The topsoil of the riverine areas is highly fertile and capable of sustaining crops of different types. With the construction of the Tarbela and Mangla dams and a number of diversion and flood protection works, the *frequency* of flooding has been reduced, but the *severity* of the floods has not.

In fact, the floods have become more severe now than before because the riverbeds have been raised due to large-scale settling of eroded soil. Pakistan has very little forest land. According to the government statistics, only 4% of the land mass can be considered as having proper forest cover.

Such a small forest cover itself poses problems of land erosion. Moreover, Pakistan's rainfall is dominated by the southeasterly monsoon which brings 80% of its rains during an eight-week period. Although some winter rains provide relief, by and large most of Pakistan experiences dry spells extending as long as 12-14 weeks. In addition, traditional grazing and indiscriminate felling of trees for commercial and domestic consumption are further eroding the grasslands and forest lands.

Man-made scourge

Particularly since the Soviet invasion of Afghanistan in 1979, millions of Afghan refugees have come to settle in makeshift camps in the ecologically delicate border areas of NWFP and Baluchistan. Reports of armed gangs of Afghan refugees cutting down trees while the forest guards look the other way have become routine. An official memorandum recently presented to the Aid Pakistan consortium of donors said that while the direct financial cost to Pakistan of taking care of the refugees over the past eight years adds up to \$1.5 billion, "there is no way of computing the [indirect] cost in the form of environmental deterioration, economic damage to the rangeland, forests and pastures of vital watershed areas, the consequential water run-off and soil eroion, the resulting reduced productivity, pressure on infrastructure like irrigation channels, roads, etc." The government of the NWFP has estimated that it will cost \$195 billion for initial rehabilitation of physical and social infrastructure in the province, following the return of the refugees to Afghanistan. Of that nearly one-third would go to forestry and pastureland restoration.

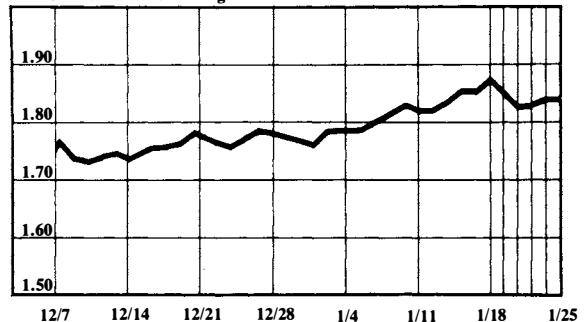
Such ecological stress has resulted in large-scale land erosion. According to hydrological studies, 280-300 tons of soil per hectare are eroded annually, partly as a result of deforestation and overgrazing. The eroded soil washes into the vast irrigation network in the plains. The irrigation network carries some of the silt to the large-scale dam-reservoirs filling up the dams—the main source of electrical power and a steady supply of water to the farmgates—and deposits the rest, raising the riverbeds. It is estimated that the capacity of Tarbela, Pakistan's largest dam, will be reduced by one-third by the year 2000 unless measures are undertaken on a war-footing.

Another distortion seriously affecting Pakistan's agro-development is the continuation of feudalism in the form of landowning elites. In Pakistan, 74% of the farmer-landholders share a small 34% of the total farm area. Seventy percent of the tubewells are installed on the lands of farmers having more than 10 hectares, while 4% of the tubewells are for those having less than 5 hectares, though this group contains 74% of the cultivators in the country. Most of the impact of the green revolution has gone unnoticed by the small-plot owning farmers. Lack of financial capability to acquire the necessary inputs has left a large number of small plots of land unproductive and low-yielding.

Currency Rates

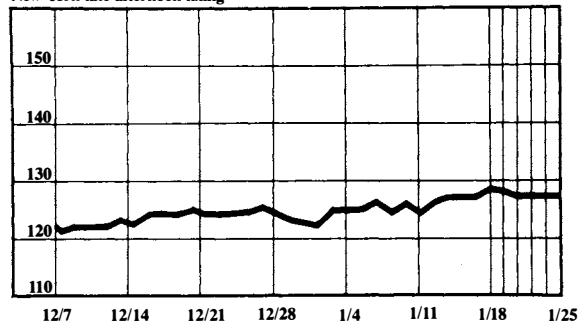
The dollar in deutschemarks

New York late afternoon fixing



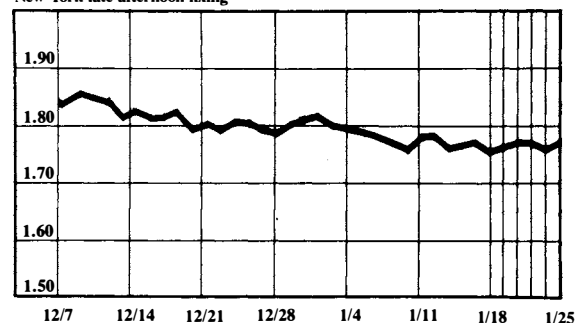
The dollar in yen

New York late afternoon fixing



The British pound in dollars

New York late afternoon fixing



The dollar in Swiss francs

New York late afternoon fixing

