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Pakistan's Agricultural Development and Trade

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ABSTRACT

Recent trends and developments in Pakistan's agricultural production and trade are discussed. The two major goals of the Pakastani Government are to attain self-sufficiency in food and to earn sufficient foreign exchange to maintain agricultural and industrial development. The use of high-yielding grain varieties, along with expanded irrigation and fertilizer use, has significantly boosted farm output, although many technical and economic problems in agricultural development remain unresolved. Pakistan's foreign trade is on the increase and its flow is shifting from Western Europe to Eastern Europe.

Key words: Pakistan, agricultural production, economic development, trade, foreign aid, agricultural policies.

EXPLANATORY NOTES

Unless otherwise indicated, Pakistan refers only to the area formerly designated as West Pakistan. East Pakistan was renamed Bangladesh in December 1971 after West Pakistan's military forces were defeated in a 2-week Indo-Pakistani war.

Unless otherwise stated, split years mean July-June, tons are metric, and dollars are U.S. dollars.

The exchange rate used in this report is 4.76 Pakistani rupees (PRs) per U.S. dollar. On May 12, 1972, the Pakistani rupee was devalued to 11.00 per U.S. dollar.

The maund, a unit of measurement used in Pakistan, equals 8,228 pounds.

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SUMMARY

Agricultural output in Pakistan rose sharply during 1965-70 as a result of new technology, changes in the use of land and labor inputs, and Government programs that encouraged agricultural development. Several problems must be solved, however, if the country's agriculture is to realize its full potential.

The gains in agricultural production have considerably improved Pakistan's food situation. Annual wheat output increased from 4.6 million to 7.3 million tons during 1965-70, with high-yielding varieties accounting for 60 percent of the 1970 harvest. Production of milled rice rose from an annual average of 1.2 million tons in 1961-65 to 2.3 million tons in 1971. During the same period, corn production increased more than 39 percent.

Output of cotton--the major nonfood crop--totaled 588,000 tons in 1971, compared with 415,000 tons in 1965. The area under cotton increased steadily, reaching 1.8 million hectares--about 12 percent of total cropland--in 1971. Production of some crops declined slightly in 1971 because of political unrest between Pakistan (formerly West Pakistan) and Bangladesh (formerly East Pakistan) and between Pakistan and India.

High-yielding seed varieties were the primary reason for the production gains. Use of high-yielding seeds was accompanied by more intensive use of agricultural labor, more fertilizer consumption, an expansion of irrigated area, and increased mechanization. Cropland expanded considerably, and the share of land used for wheat, rice, and corn production also increased. The Government provided economic incentives to farmers through selective price-support programs. Credit programs to facilitate the purchase of fertilizer, pesticides, and farm equipment were expanded. The Government also provided extension services and engaged in agricultural research and education programs.

Agricultural development will continue to be given high priority by the Pakistani Government. The goals are to achieve self-sufficiency in food and to earn sufficient foreign exchange from agricultural exports to maintain agricultural and industrial development.

Certain obstacles must be overcome, however, if these goals are to be met. Many farms are uneconomically small and fragmented. The farmers' poverty is often so acute that they are unable to make required financial investments or obtain institutional credit. Agricultural credit institutions, in turn, are underfinanced and understaffed. Market channels are poor because most farms are remote from the market and roads and transport facilities are inadequate. Successful mechanization of agriculture is difficult because many farmers are unfamiliar with machinery. Skilled repairmen and support facilities--such as garages and fuel stations--are in short supply. Waterlogging and soil salinity have become serious problems in the irrigated areas.

Agricultural commodities account for about 76 percent of Pakistan's export earnings. Trade with Eastern Europe is increasing through barter and commodity exchange agreements. Trade with the United States and Western Europe, though substantial, is declining.

PAKISTAN'S AGRICULTURAL DEVELOPMENT AND TRADE

by

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INTRODUCTION

Pakistan's overall economic development is closely tied to progress in the agricultural sector. Sixty-eight percent of the 60 million inhabitants live in rural areas, and over 76 percent of export earnings are from agricultural products. Agriculture contributes about 38 percent to Pakistan's gross domestic product, which totaled about $10.0 billion in 1971.

This study delineates major changes and developments that have occurred in Pakistan's agricultural production and trade, and discusses some of the reasons for these developments. Special attention is given to the dramatic increase in wheat and rice production and to the expanded use of various agricultural inputs, especially high-yielding seed varieties, fertilizer, and irrigation. Government pricing policies and foreign assistance are discussed, and prospects for and constraints on further agricultural development are outlined.

TRENDS IN AGRICULTURAL AND FOOD PRODUCTION

Pakistan's total agricultural production increased significantly during the last decade although most of the gain occurred in the last half of the period (fig. 2). The index of agricultural production (1961-65=100) rose from 87 in 1961 to 110 in 1965 and 160 in 1972 (app. table 2). Political unrest and disruptions caused by the war between Pakistan and India along with shortages of irrigation water and fertilizer led to smaller wheat production in the last 2 years. Yet, gains in cotton and several other crops pushed total agricultural output to a record in 1972.

Large populations and unabated population growth in the developing countries make per capita food production a critical measure of agricultural gains. As indicated in figure 2, per capita food production in Pakistan has increased significantly but at a slower rate than total agricultural production.

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Figure 1

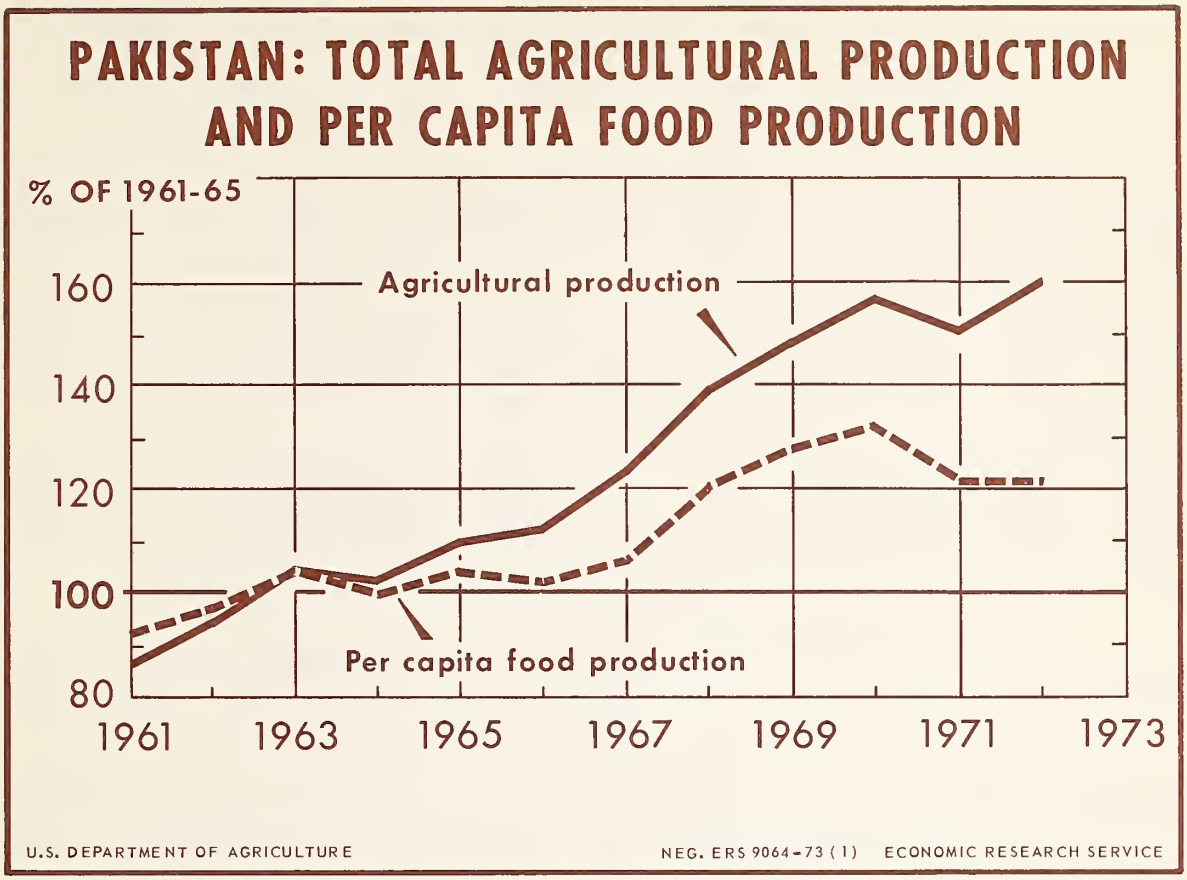

Figure 2

MAJOR COMMODITIES CONTRIBUTING TO INCREASED AGRICULTURAL OUTPUT

The most important commodities responsible for boosting agricultural production in Pakistan during 1961-70 were wheat, rice, corn, and cotton. These crops were given priority in the research and development efforts of the Government. Significant production gains were also achieved for sugar and potatoes.

Wheat

Wheat is the staple food of all Pakistanis except for persons living in the northern Himalayan foothills, where corn is the staple food.

Pakistan's wheat production rose from 4.6 million tons in 1965 to 7.3 million tons in 1970, an increase of nearly 60 percent (table 1). Output is estimated to have dropped to 6.5 million tons in both 1971 and 1972; in 1971 as a result of political disturbances and in 1972 as a result of water shortage. Part of the increased wheat production can be attributed to the 17-percent expansion in area planted during 1965-70. Most of the larger output, however, is due to

Table 1--Area, yield, and production of wheat in Pakistan, by native and high-yielding varieties, 1965-71

Item	Unit	1965	1966	1967	1968	1969	1970	1971 1/
Total area	1,000 ha.	5,318	5,155	5,344	5,983	6,160	6,229	5,978
Total production	1,000 mt.	4,591	3,916	4,334	6,418	6,618	7,294	6,476
Yield	kg. per ha.	863	760	811	1,073	1,074	1,171	1,083
Native varieties:								
Area	1,000 ha.	5,318	5,150	5,243	5,024	3,784	3,539	3,138
Production	1,000 mt.	4,591	3,902	4,111	4,181	2,669	2,876	1,651
Yield	kg. per ha.	863	758	784	832	705	813	526
High-yielding varieties:								
Area	1,000 ha.	0	5	101	959	2,376	2,690	2,840
Production	1,000 mt.	0	14	224	2,237	3,949	4,418	4,825
Yield	kg. per ha.	0	2,800	2,218	2,333	1,662	1,642	1,700
Percentage of total area:								
Native varieties	Percent	100	99.9	98	84	61	53	52
High-yielding varieties	do.	0	0.1	2	16	39	47	48
Percentage of total production:								
Native varieties	do.	100	99.6	95	65	40	40	25
High-yielding varieties	do.	0	0.4	5	35	60	60	75

1/ Preliminary.

Source: (25, 35) and U.S. Dept. of Agr., Foreign Agr. Serv.

Table 2--Area, yield, and production of milled rice in Pakistan, by native and high-yielding varieties, 1965-71

Item	Unit	1965	1966	1967	1968	1969	1970	1971 1/
Total area	1,000 ha.	1,393	1,410	1,420	1,555	1,622	1,503	1,501
Total production	1,000 mt.	1,316	1,364	1,499	2,032	2,401	2,163	2,298
Yield	kg. per ha.	945	967	1,056	1,307	1,480	1,439	1,494
Native varieties:								
Area	1,000 ha.	1,393	1,410	0	1,247	1,120	896	881
Production	1,000 mt.	1,316	1,364	0	1,380	1,375	898	875
Yield	kg. per ha.	945	967	0	1,107	1,272	1,002	993
High-yielding varieties:								
Area	1,000 ha.	0	0	0	308	502	607	620
Production	1,000 mt.	0	0	0	652	1,026	1,265	1,423
Yield	kg. per ha.	0	0	0	2,117	2,044	2,084	2,295
Percentage of total area:								
Native varieties	Percent	100	100	100	80	69	59	59
High-yielding varieties	do.	--	--	--	20	31	42	42
Percentage of total production:								
Native varieties	do.	100	100	100	68	57	41	38
High-yielding varieties	do.	--	--	--	32	43	58	62

1/ Estimated.

Source: Total production and area data from (35). Data on native and high-yielding varieties from Agricultural Attache reports.

the 37-percent average increase in yields over the period. Over 40 percent of the arable land is devoted to wheat, with two-thirds of the wheat acreage being irrigated. The Punjab Province accounts for 80 percent of the wheat crop followed by Sind Province with 13 percent, the North-West Frontier Province with 6 percent, and Baluchistan Province with 1 percent.

Rice

Milled rice production in Pakistan increased from nearly 2 million tons in 1968 to 2.4 million tons in 1969 (table 2). Production dropped to 2.2 million tons in 1970 but recovered to an estimated 2.3 million tons in 1971. Total rice acreage has increased, with expansion in high-yielding varieties more than offsetting declines in native varieties. Yields from native varieties are about one-half those of the high-yielding varieties.

Although production of rice is far less than that of wheat, rice is a major foreign exchange earner in Pakistan's economy. Basmati rice is raised for export, while high-yielding varieties--such as IR-8, Parmal, and Begmi--and native coarse rice are raised for home consumption.

Corn

Coarse grains grown in Pakistan include millet, sorghum, barley, and corn. Of these, corn has been subjected to the most intense research and development. Corn is an important food and fodder crop in Pakistan.

During the first half of the 1960's, corn production was fairly stable at around 500,000 tons (table 3). The peak production year was 1967, when unusually favorable weather resulted in an outturn of 792,000 tons. During 1968-71, production fluctuated between 626,000 and 668,000 tons, about equally divided between the Punjab and Sind Provinces. Information is not available on the acreage in or production from hybrid corn.

Cotton

Cotton is the major nonfood cash crop of Pakistan. The area under cotton has been increasing steadily over the last few years, reaching 1.8 million hectares in 1971 or about 12 percent of total cropland. This expansion is the result of the Government's vigorous effort to encourage increased plantings of cotton and adoption of new technology.

Pakistan's cotton production totaled 588,000 tons in 1971 (table 3). Two kinds of cotton are grown--upland American cotton which is medium staple, and Desi, a short-staple, medium-quality cotton. The American upland varieties account for about 95 percent of cotton production and dominate the irrigated land. Production of Desi cotton is confined to rain-fed areas. The Punjab grows about three-fourths of the cotton and the Sind, one-fourth.

Table 3--Area, yield, and production of corn, cotton, potatoes, and rice in Pakistan, average 1961-65, and annual, 1965-71

Item	Unit	1961-65 average	1965	1966	1967	1968	1969	1970	1971 1/
Corn:									
Production	1,000 M.T.	514	540	587	792	626	667	717	668
Area	1,000 ha.	492	542	554	608	616	648	665	665
Yield	kg. per ha.	1,045	996	1,059	1,303	1,016	1,029	1,078	1,004
Cotton:									
Production	1,000 M.T.	380	415	455	517	528	537	527	588
Area	1,000 ha.	1,453	1,561	1,620	1,785	1,743	1,756	1,734	1,769
Yield	kg. per ha.	262	266	281	290	303	306	304	332
Upland (Amer.):									
Production	1,000 M.T.	353	392	425	480	495	508	500	563
Area	1,000 ha.	1,279	1,389	1,437	1,573	1,548	1,591	1,598	1,639
Yield	kg. per ha.	279	282	296	305	320	319	313	344
Desi (short staple):									
Production	1,000 M.T.	27	23	30	37	33	29	27	25
Area	1,000 ha.	174	172	183	212	195	165	136	130
Yield	kg. per ha.	155	134	164	174	169	176	198	192
Potatoes:									
Production	1,000 M.T.	133	173	153	168	189	194	200	205
Area	1,000 ha.	16	19	17	19	20	21	23	23
Yield	kg. per ha.	8,312	9,105	9,000	8,842	9,450	9,238	8,696	8,913
Sugarcane:									
Production	1,000 M.T.	15,852	18,670	22,310	21,988	18,660	21,971	26,369	24,459
Area	1,000 ha.	469	503	597	650	504	541	620	625
Yield	kg. per ha.	33,800	37,117	37,370	33,828	37,024	40,612	42,531	39,134

1/ Preliminary.
Source: (4, 35, 36).

Potatoes

Potato production in Pakistan increased from an annual average of 133,000 tons in 1961-65 to 205,000 tons in 1971. Area planted increased from 16,000 to 23,000 hectares during the same period.

The Government of Pakistan is pushing for increased production and consumption of potatoes to improve the nation's diet. New high-yielding potato varieties that are resistant to late blight and potato wilt are being sought.

Sugarcane

Sugarcane production, although varying substantially from year to year, showed a sharp increase during the 1960's. Area planted to sugarcane increased from an annual average of 469,000 hectares in 1961-65 to 625,000 hectares in 1971. Yields have also increased through greater use of improved seeds, fertilizer, irrigation, and pesticides.

The Punjab produces nearly three-fourths of the cane crop, followed by the North-West Frontier and Sind Provinces, with each accounting for about one-eighth of the crop. Only negligible quantities are produced in Baluchistan. About 3 percent of the arable land is devoted to cane.

At present, Pakistan's sugarcane production depends upon two widely used varieties, L29 and CO.L54, which have been under extensive cultivation for a long time. New strains such as BL.4 and LB.19 have been recently developed at the Pakistan Agricultural Research Institute at Lyallpur and appear very promising. They may replace existing varieties. Pakistan will continue to increase sugarcane production to reduce sugar imports and, hence, to save on foreign exchange.

TRENDS IN AGRICULTURAL INPUTS

The expansion in Pakistan's agricultural production can be attributed to the use of new technology in combination with the long-enduring basic inputs of land and labor. The amount of land used in agriculture and the nature of labor applied have also changed.

Land

Expansion of agricultural land is one of the major reasons for the recent "grain revolution" of Pakistan. In 1959, a little more than 12 million hectares of land were used for crop production. Despite bad weather and war with India, Pakistan increased its cropland to about 13 million hectares in 1965. By 1970, total cropland had increased to over 14 million hectares.

Pakistan covers approximately 81 million hectares. Although 24 million

hectares--about 30 percent of total land area--are considered tillable, only about 20 million hectares are presently cultivated. Of the 20 million hectares, about 6 million are fallowland.

Some 13.4 million hectares are under irrigation to varying degrees from surface and subsurface water resources. Most of the irrigated area overlies a deep rift valley that is filled with alluvium. The valley constitutes a tremendous ground water aquifer containing water ranging from saline to sweet.

The Pakistani Government has encouraged land development. During the first Five-Year Plan (1955-60), 202,000 hectares of virgin land were brought under cultivation. An additional 500,000 hectares were added during the second plan (1961-65). In the third plan (1965-70), the target was 263,000 hectares, but only 121,400 hectares were developed.

The share of land used for wheat production increased steadily during 1965-70. A similar situation existed for rice (except in 1970) and corn. With increasing irrigation, there has been a shift from dryland crops to the more profitable irrigated crops. Consequently, the percentage of land devoted to millet, barley, rapeseed, and pulses--all dryland crops--can be expected to decline. Acreage planted to rice, wheat, corn, sugarcane, and cotton--all very responsive to irrigation--will increase.

Labor

Pakistan is shifting from an extensive to an intensive agriculture. The introduction of high-yielding grain varieties, with associated new technology and its increased inputs, has significantly increased labor requirements, especially for larger farms. Even on smaller farms, the existing labor is used more intensively. Labor requirements for the harvesting, weeding, and care of high-yielding grains are estimated to have increased 20 to 40 percent, primarily because of the use of more water and fertilizer.

In many parts of the Indus Plain, where high-yielding wheat varieties have been fully adopted, labor costs as a component of total per acre production costs have greatly increased. Larger farmers have turned to threshers and combines to reduce labor costs.

The land-use pattern is shifting toward high-yielding grain varieties, potatoes, rice, and truck farming, all of which require more labor. Where soil fertility was previously a limiting factor, many farmers have been induced to produce a second crop through the use of chemical fertilizers, resulting in more intensive year-round use of labor.

High-Yielding Seed Varieties

High-yielding varieties of seeds are one of the most essential ingredients for increasing farm production. Much of Pakistan's increased agricultural production may be attributed to improved, high-yielding varieties of food grains.

Pakistan's Agricultural Development Corporation (ADC), which supervises the procurement and distribution of agricultural inputs, has created a number of foundation seed farms for producing improved seeds. The corporation is also introducing a program of large-scale seed production with registered growers who will produce seed which the Government will buy at premium prices. Seed testing laboratories have been set up to ensure that quality, weed- and disease-free seed is produced and distributed to farmers. Seed is sold to farmers at 25 percent of cost.

In 1968, Pakistan imported 42,000 tons of semidwarf wheat seed from Mexico and produced locally about 600 tons of high-yielding wheat varieties. About 16 percent of the 1968 wheat acreage was planted to Mexican high-yielding varieties, which have been renamed Mexi-Pak in Pakistan. This acreage accounted for 35 percent of the total wheat crop in 1968. The major reason for Mexi-Pak's success in Pakistan was its complete environmental adaptability. Dwarf wheat had been developed in Mexico under irrigation in almost the same latitude as the Indus Basin. When introduced into Pakistan, it did not develop any significant insect or disease problem.

The Government of Pakistan imported 2 tons of IR-8 rice from the Philippines in 1966. Yields from IR-8 by 1968 were double those of native rice--2,117 kilograms per hectare, compared with 1,107. Unfortunately, IR-8 is very chalky, leading to export problems and consumer resistance at home. With conventional milling processes, as much as 30 percent broken rice grain has been reported.

IR-6 and Mehran 69 -- two other high-yielding rice varieties--have better grain quality than IR-8 and are being multiplied in Pakistan and distributed to farmers. In addition, the Government has distributed improved varieties of other rice, including Basmati. Basmati rice is Pakistan's only food crop earning substantial foreign exchange. The Basmati grower is required to sell his crop to the Government for export, so domestic consumption is very limited. A new variety, Dokri Basmati, has been evolved by selection and isolation from Punjab Basmati types. It is fertilizer-responsive, gives 50 percent more yield than regular Basmati, and escapes the stem borer because of early maturity (75 to 80 days, compared with 115 to 120 days). Another variety, Basmati 370, which matures in 120 to 125 days, is suitable for borer-free areas. Another promising Basmati hybrid is IR-42.

Although production of pulses has declined as more cropland has come under irrigation, efforts are being made to develop new higher yielding varieties. New black chickpea varieties are C360/1 and Punjab 7 (for dryland farming) and C612, CS26, and CS35 (for irrigated areas). The white-seeded hybrids, C/57 and C/147, give a better yield than does the standard Punjab 1. Other pulses are lentils, mung beans, arhar, mash, and masoor. Continuous research is going on in Pakistan to discover new disease-resistant, high-yielding pulses.

Pakistan has overcome major shortages in seed supplies that occurred during the early 1960's. By 1975--the end of the Fourth Five-Year Plan--it is projected that the following percentages of area planted to major crops will be covered with improved seeds: rice, 45 percent; wheat, 65 percent; corn,

20 percent; cotton, 75 percent; and oilseeds, 15 percent (7).[1/]

Area planted to early-maturing corn varieties has increased in Pakistan. These varieties, which are ready for harvest in 75 to 100 days, have been the major reason for the growth in corn production. Some hybrid corn varieties have been imported from the Ford and Rockefeller Foundations for experimental purposes. Of these varieties, J-1 has given the most satisfactory performance under normal planting conditions in Pakistan.

Several new high-yielding varieties of upland cotton are being grown in Pakistan. MS-39 and MS-40, introduced in 1969, are very promising. These varieties are characterized by a staple length of 1½ inches and relatively high yields. Some research has been done in crossing Egyptian and adapted upland varieties. High-yielding upland varieties combined with abundant use of fertilizers, water, and effective plant protection measures are largely responsible for increasing cotton yields in Pakistan.

Pakistan is trying to develop high-yielding varieties of potatoes resistant to late blight and wilt. Three varieties of potatoes--Scottish No. 3, Italian white round, and Italian white long--have been imported to cross with native varieties.

Fertilizer

Increased use of chemical fertilizers has made a major contribution to increased food crop production in Pakistan. Soils are deficient in varying degrees in different nutrients, but particularly in nitrogen (N) and phosphorous (P_2O_5).

Pakistan first started to produce chemical fertilizer in 1957 at Lyallpur, with an annual plant capacity of about 4,000 nutrient tons of P_2O_5. By 1961, the Government had added two more plants, one at Daudkhel and the other at Multan, with each having an annual capacity of 11,000 and 57,000 nutrient tons of nitrogen, respectively. All three plants were expanded and their total yearly capacity increased from 72,000 nutrient tons in 1967 to 100,000 nutrient tons in 1968. Two private plants--one at Mari with a capacity of 76,500 nutrient tons and the other at Karachi with a capacity of 56,000 nutrient tons--have also started to produce chemical fertilizer. None of the plants, however, is operating at full capacity, and total 1971 fertilizer production amounted to only 139,000 nutrient tons (table 4).

The recent awakening of the Pakistani farmer to the economic advantages of using chemical fertilizers to increase crop yields has caused accelerated growth in fertilizer use. Nitrogen fertilizer use increased from 70,000 nutrient tons in 1966 to 206,000 nutrient tons in 1969 (table 5). Phosphate nutrient consumption increased sharply, from 1,200 tons in 1966 to 40,000 tons

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1/ Underscored numbers in parentheses refer to references listed at the end of this report.

Table 4--Chemical fertilizer production in Pakistan, 1967-71

Type of nutrient	1967	1968	1969	1970	1971
	1,000 nutrient tons				
Urea	20	20	50	78	94
Other nitrogen	29	30	28	32	40
Total	49	50	78	110	134
Phosphate	2	3	3	5	5
Grand total	51	53	81	115	139

Source: (29, 30, 34).

Table 5--Fertilizer consumption in Pakistan, 1966-69

Type of nutrient	1966	1967	1968	1969
	1,000 nutrient tons			
Nitrogen (N)	70.8	112.3	117.7	206
Phosphate (P_2O_5)	1.2	3.9	11.3	40
Potash (K_2O)	--	--	.2	2
Total	72.0	116.2	189.2	248
	Percent			
Percent increase	--	61	63	31

Source: (29, 30, 34).

in 1969. Very little potash was consumed during this period.

A major part of Pakistan's fertilizer supply has to be imported because domestic production has not kept pace with increased demand. In 1967, production met 44 percent of requirements, compared with 33 percent in 1969. The value of imported fertilizers rose from $11.8 million in 1966 to $25.9 million in 1969 and to $59.3 million in 1970. Most of the fertilizer was imported on grants or with foreign aid assistance.

Distribution of fertilizer in Pakistan is handled on a cash basis by the following organizations: The Pakistan Industrial Development Corporation, the Agricultural Development Corporation, and the Rural Supply Credit Corporation. Their share of the business is 50, 25, and 25 percent, respectively. Improvements in fertilizer distribution are expected to occur as domestic fertilizer production and farmers' purchasing power increases. Plans are to transfer the distribution of fertilizer to the private sector, with the Agricultural Development Corporation coordinating and supervising this distribution.

Irrigation

Irrigation has always been and will continue to be vital to Pakistan's agriculture. Development of water resources, surface as well as subsurface, has contributed substantially to the country's increasing agricultural production. The new grain varieties and the increased use of fertilizers call for more intensive irrigation.

Pakistan's entire surface water irrigation system is based on one of the world's largest and oldest canal networks. This canal network, which is fed by the Indus River and its tributaries, covers a gross area of 15.4 million hectares, of which about 90 percent is arable. At present, about 10 million hectares receive canal water supplies. The annual flow of the Indus and its tributaries is about 69 million hectare feet.

Production of the three major crops--wheat, rice, and cotton--is almost entirely confined to the canal-irrigated area. Besides the Indus and its tributaries, the Swat, Kabul, and Kurrum rivers are being utilized for the production of hydroelectric power and irrigation.

Tubewells for tapping groundwater have only recently become significant in the expansion of water supply in Pakistan. The tubewells in Pakistan fall into two classes, public and private. Public tubewells are Government-owned and the farmer pays a user's fee. Private tubewells are owned by individual farmers, who rent their excess capacity to others. The number of tubewells increased from 1,780 in 1963 to 83,000 in 1968. Over 90 percent of all tubewells were privately owned in 1968. The irrigated area covered by tubewells increased from 53,000 hectares in 1964/65 to 77,000 in 1966/67, covering about 6 percent of the total irrigated area in 1966/67. There is a great demand in Pakistan for electric and diesel tubewells for irrigation and for fighting soil salinity and waterlogging.

Pakistan's fourth Five-Year Plan (1970-75) calls for 3 million acre feet

of new surface water impoundment to be added to existing supplies. This is to be accomplished by diverting water from one river to another, by building new storage basins, and by enlarging existing canals. At the same time, the drilling of about 6,000 public and 30,000 private tubewells is anticipated. Tubewells are expected to add 13 million acre feet of groundwater by 1975. These achievements would increase total water availability from 66.5 million acre feet in 1964/65 to 99 million acre feet in 1975. Total area under irrigation is expected to increase from 11.2 million hectares in 1964/65 to 13.6 million hectares in 1975. If these targets are met, water availability will have increased by 50 percent and irrigated land by 21 percent--hence, water use per hectare will have increased.

Mechanization

The Government of Pakistan has encouraged mechanization of agriculture. Farmers have been shown techniques such as tubewell drilling and improved methods of land preparation. Demonstrations have also illustrated the advantages of mechanization in achieving timeliness in double-cropping.

In the past, the Government subsidized the purchase of farm tractors. In 1968, nearly 19,000 tractors were in use in Pakistan, with the Government owning 2,326 of these (19, p. 24).

During the second Five-Year Plan (1960-65), the Government set up workshops for instruction in machinery repair. Instruction was also provided for machine operators and other technicians.

The sharp increase in wheat production has resulted in a shortage of harvest labor on the bigger farms. As a consequence, harvesting has been delayed and the farmers have suffered losses from lodging of wheat. To overcome these difficulties, the Government has imported combines. A number of wheat threshers have been manufactured locally.

A special committee in mechanization of agriculture has been formed by the Pakastani Government to accelerate the pace of agricultural development.

Pesticides and Other Plant Protection

Use of pesticides and other plant protection measures has not increased as much as has use of other agricultural inputs in Pakistan. Data available on pesticides and plant protection are incomplete, but it is estimated that in 1969/70, approximately one-third of the farmland in Pakistan received some kind of chemical plant protection. The Government expects a fairly sharp rise in pesticide consumption during the 1970's.

At present, all pesticides and plant protection equipment are handled by the Pakistan Agricultural Development Corporation. All pesticide applications are made under the supervision of the Pakistan Agriculture Department. The Department's extension workers are responsible for plant protection operations on the ground, while aerial spraying is carried out by the Central Plant Pro-

tection Agency of the Department. Both the on-ground applications and the aerial spraying services were free through 1966. Aerial spraying is still free, but for on-ground applications, farmers are assessed a nominal charge of 25 percent of the cost of pesticides.

Pesticides and plant protection materials are imported either in their commercial form or as active ingredients to be formulated by local plants. The only pesticides manufactured locally are DDT(dichloro diphenyl trichloroethane) and BHC (benzene hexachloride).

Table 6--Area treated with pesticides in Pakistan, 1960, 1965, and 1970[1/]

Treatment	1960	1965	1970
	1,000 hectares		
Curative	.6	1.3	2.4
Preventive	.9	1.2	3.4
Total	1.5	2.5	5.8

1/ Years ending June 30.
Source: (24).

Preventive measures in plant protection are generally more economical than curative measures. With the increased use of high-yielding varieties of wheat and rice, which are less resistant to insects and disease than local varieties, preventive use of pesticides has become necessary and is now more prevalent than curative measures (table 6).

FACTORS PROMOTING AGRICULTURAL DEVELOPMENT

To promote agricultural development, the Government of Pakistan has found it necessary to change traditional patterns of land ownership and to alter policies on farm prices, credit, and trade. Also, education, research, and extension programs have been improved. In addition to these efforts of the Pakistani Government, foreign assistance has been important in the country's agricultural development.

Government Policies and Programs

Land Reform

Before enactment of land reforms in 1959, the land in Pakistan was distributed unevenly. About 3.3 million persons owned less than 2 hectares of land

each, about 5,700 persons owned between 40 and 202 hectares each, and 6,100 persons held 202 hectares or more.

This marked disparity in land ownership--with 0.1 percent of the people owning 15 percent of the land--meant that the majority of the farm population was dependent on a few big landowners. To redistribute the land, the Government promulgated the West Pakistan Land Reform Regulation. This regulation provided that no person could own land in excess of 202 hectares of irrigated land or 405 hectares of unirrigated land. The purpose of this regulation was to increase agricultural production. The Government purchased all land in excess of allowable limits at fair market prices and sold it to settling tenants at subsidized prices. Although some progress toward more equitable distribution of property was achieved, in 1965 nearly half the farmers still accounted for only 11 percent of the agricultural land. On the other hand, only 8 percent of the farmers accounted for 35 percent of the agricultural land. By 1968, 49 percent of the land was still tenant-cultivated.

The Land Reform Regulation provided that farms could not be partitioned into holdings of less than 20 hectares if larger than 20 hectares at that time. Farms less than 20 hectares in size could not be partitioned into holdings of less than 5 hectares. A corollary policy of the Pakistani Government is the consolidation of uneconomic holdings.

In March 1972, President Bhutto announced new land reforms that supersede the 1959 reforms. Under the new reforms, the individual landholding ceiling for irrigated land is reduced from 202 to 61 hectares. Landholding limitations in unirrigated areas correspond to the land's productivity.

Price Policies

Most major food crops are under a price-support program in Pakistan. This provides farmers with an incentive to increase crop area and to adopt better cultural practices and new technology.

In April 1967, the support price of wheat was raised from PRs. 14.50 to PRs. 17.00 per maund. This price incentive encouraged the adoption of high-yielding wheat varieties, and wheat production rose from 4.3 million tons in 1967 to 6.4 million tons in 1968. To carry out the wheat price-support program, the Government purchased 780,000 tons of wheat in 1968/69 and 802,000 tons in 1969/70, approximately one-eighth of the total harvest for each year.

In 1965, the Government initiated a rice price-support program to boost Basmati rice production. The support price of Basmati was raised from PRs. 28 per maund in 1966/67 to PRs. 31 in 1967/68 and to PRs. 38 in 1968/69. Production of Basmati rice increased in 1967 and 1968, creating a glut in the export market. In May 1970, the support price was reduced to PRs. 32 per maund. Generally, the support price for coarse rice--which includes IRRI-6 and 8, Parmal, Begmi, Kangni, Mehran, and Jashi--has been about half that for Basmati. The Government purchased about 130,000 tons of Basmati in 1966/67, 160,000 tons in 1967/68, and about 225,000 tons in 1968/69. Purchase of coarse rice by the Government varied between 250,000 to 450,000 tons during the same period.

The price-support programs have helped Pakistan achieve food grain self-sufficiency. Prospects are that the support programs will continue with necessary modifications from time to time.

Credit Organizations

A major problem in expanding agricultural production in developing countries like Pakistan is the availability of credit at a reasonable cost. Under the Land Improvement Loan Act of 1884, the Pakistani Government provides loans to farmers. These loans--or Taccavi--are administered directly by the Provincial governments. Loans are payable over a period of 1 to 20 years, depending on the need for and purpose of the loan. Loans for permanent capital improvements such as houses, canals, wells, or purchase of land are made on a long-term basis. Loans for seed, livestock, and other minor inputs are provided on a short-term basis. In bad crop seasons or during other disasters, the Government may suspend repayment temporarily or write-off the loans altogether. Taccavi loans are not popular with farmers because of the lengthy and cumbersome procedure involved in securing such loans, which often arrive too late.

A cooperative credit movement began in Pakistan at the turn of the century. By 1967, there were about 14,000 cooperative agricultural credit societies. About 8 percent of the rural families--or over 600,000 members--belonged to these credit societies. The working capital of the credit co-ops, including owned and borrowing funds, was PRs. 126 million in 1966/67. Farm credit supplied by cooperatives totaled about PRs. 83 million by the end of 1966/67. Annual interest rates are 9 percent.

In 1960, the State Bank of Pakistan established a rural credit fund with PRs. 10 million to provide medium-term loans and advances to rural credit agencies. By 1967, this fund had been increased to PRs. 75 million.

The Government of Pakistan established the Agricultural Development Finance Corporation in 1952 and an Agricultural Bank in 1957. In 1961, these two institutions were merged into the Agricultural Development Bank of Pakistan (ADBP). The main function of this bank is to provide credit to individuals or corporate bodies engaged in agriculture, in the development or marketing of agricultural products, and in related activities.[2/] The interest rate is 6 percent on long-term loans and 7 percent on short-term loans. The bank conducts its lending operations through its branches, subbranches, and pay offices, most of which are located in rural areas accessible to farmers. The ADBP covers about 9 percent of the farmers. Its average annual lending capacity has been about PRs. 80 million to PRs. 100 million. However, it advanced about PRs. 171 million as loans during 1967/68 and probably loaned about PRs. 200 million in 1968/69.

2/ One function of the ADBP is to give loans to landless farmers up to a maximum of PRs. 500 each on personal surety, subject to certain conditions.

Despite the expansion of institutional credit, over 80 percent of the agricultural credit is extended by noninstitutional sources such as friends and relatives, moneylenders, and shopkeepers, frequently at high interest rates. With the amount of purchased inputs in agriculture increasing, it is expected that the institutional share of the credit market will expand and the noninstitutional share will decline.

Education, Research, and Extension

When Pakistan was partitioned into East and West Pakistan in 1947, West Pakistan had only two agricultural colleges, one at Lyallpur and the other at Sakrand (Sind). The college at Sakrand was relocated at Tandojam and expanded. In 1956, the agricultural college at Lyallpur was expanded to a full-fledged university, providing professional training in agriculture, animal husbandry, agricultural economics, fisheries, cooperatives, and agricultural engineering. A new agricultural college was established at Peshawar with the help of Colorado State University. The number of college students enrolled in agriculture increased from 832 in 1961 to 2,412 in 1966.

Agricultural research in Pakistan is the joint responsibility of the Central and Provincial Governments. The Central Government's research bodies are the Pakistan Agricultural Research Council and the Pakistan Central Cotton Committee. At the Provincial level, there are three research institutions--at Tarnab near Peshawar, at Resalewala near Lyallpur, and at Tandojam near Hyderabad. Under these three institutes, there are a number of agricultural districts. Other agricultural research organizations are the Veterinary Research Institutes at Peshawar and Lahore and the Animal Husbandry college at Lahore.

Pakistan's agricultural extension service has improved during the last decade. During 1960-68, the staff of the extension service grew about 60 percent, increasing from 3,000 to 4,800 employees. This service is especially vital to agricultural development in a country like Pakistan, where the level of farmer education is very low and farming methods are changing drastically. Further expansion of extension services is needed, particularly at the village level. An expansion is planned in the fourth Five-Year Plan. Emphasis will be placed on training farmers and their sons in the new agricultural technologies.

In addition to extension services, the Pakistan Department of Agriculture conducts short courses in various techniques and skills of agricultural production under the auspices of the Agricultural Development Corporation.

Trade Policies

Foreign trade is controlled by the Central Government of Pakistan, but administered by the Provincial governments. An import license is required for all commercial imports except items imported on Government accounts, which are purchased by the various departments directly. The central Government has a monopoly on the import of wheat, rice, and sugar and keeps a tight control on

foreign exchange earned through exports of cotton, rice, wool, and hides and skins.

To stimulate exports, the Government introduced the "Export Bonus Scheme" in the early 1960's. Under this plan, exporters of certain cotton products, Basmati rice, and other selected agricultural commodities are eligible to receive 20 percent of the total foreign exchange earned from these commodities in the form of import certificates. These certificates, which are freely bought and sold within the country, are used for importing more than 200 authorized commodities.

Prior to 1970, exporters of manufactured goods (except cotton) received import certificates valued at 40 percent of the foreign exchange earned from exports. Exporters of the primary agricultural products (raw cotton, raw wool, and hides and skins), which have traditionally earned all of Pakistan's foreign exchange, did not receive import certificates. In 1970, the Government revised the Export Bonus Scheme on primary commodities. Exporters of such products can now receive import certificates valued at 10 percent of the foreign exchange earned on export of raw jute, raw cotton, and hides and skins if the products are exported through the Trading Corporation of Pakistan.

Pakistan's foreign exchange rate has historically been tied to the Pound Sterling. In September 1971, however, Pakistan decided to shift to the U.S. dollar in an attempt to improve its balance of trade. It is expected that Government control of imports and exports will continue as a device for conserving foreign exchange and for promoting development of selected sectors of the economy.

Foreign Assistance

Outside assistance to Pakistan in the area of economic development has been in the form of technical assistance, grants, loans, and other aid.

Technical Assistance

Since 1950, Pakistan has received assistance under the Colombo Plan, a forum of donor countries providing foreign aid to Asian countries.[3/] By the end of 1969, over 1,300 visiting foreign experts had offered their services to Pakistan, and nearly 7,250 Pakistani students and trainees had received training in a foreign country. Of the 54 experts who visited Pakistan in 1969, 16 provided assistance in agricultural development. Total Colombo Plan technical assistance received by Pakistan in 1969, including equipment for research and technical institutes, amounted to $7.7 million (table 7). Nine countries provided this assistance, but primarily the United States and Britain.

3/ This discussion includes data on East Pakistan (now Bangladesh).

The United Nations has also provided technical assistance to Pakistan under U.N. expanded programs. In 1968, the United Nations sent 135 technical experts to Pakistan to provide assistance in public health and in agricultural and industrial development.

The United States has been generous in helping Pakistan in economic development, not only through the Colombo Plan and U.N. programs, but also directly through the U.S. Agency for International Development (AID). In 1968, the United States sent 184 scientists and technicians to Pakistan through AID programs. Of these experts, 16 were sent under participating Agency Service Agreements, 53 went under university contracts, and 115 went under regular AID programs.

Table 7--Technical assistance received by Pakistan under the Colombo Plan, 1969 1/

Country	Trainees and students 2/	Visiting experts 3/	Value of technical assistance
	Number	Number	1,000 dollars
Australia	33	3	326.1
Britain	128	2	1,198.0
Canada	29	1	414.9
Sri Lanka	1	0	0.8
Japan	0	17	447.9
New Zealand	3	0	16.0
Philippines	6	0	0.9
Singapore	1	0	5, 1.4
United States	279	31	5,277.4
Total	532	54	7,683.4

1/ Data include East Pakistan (now Bangladesh).
2/ Pakastanis receiving training in the country indicated.
3/ Experts from the country indicated who visited Pakistan.

Source: (24).

Grants, Loans, and Other Aid 4/

In addition to the Colombo Plan, Pakistan has been receiving foreign economic assistance in the form of grants and loans. The first project loan was from the World Bank in 1952, and the first commodity loan agreement was negotiated with the Export-Import Bank (Washington, D.C.) in 1952. Foreign economic assistance has continued to increase over the years as indicated in table 8.

4/ Discussion and data include East Pakistan (now Bangladesh).

Table 8--Foreign economic assistance received by Pakistan, 1950-70 1/

Period	Grants		Loans		Total	
	Amount	Share	Amount	Share	Amount	Share
	Million dollars	Percent	Million dollars	Percent	Million dollars	Percent
1950-55	251	67.7	121	32.2	372	100
1955-60	576	57.9	417	42.1	993	100
1960-65	345	14.6	2,023	85.4	2,368	100
1965-70	193	7.1	2,507	92.9	2,700	100
July-Dec. 1970	15	2.6	560	97.4	575	100

1/ Includes East Pakistan (now Bangladesh). Data are for years ending June 30.

Source: (10, p. 49).

Table 9--U.S. PL 480 assistance to Pakistan, 1966-70 1/

Year	PL 480 2/			Total
	Title I	Title II	Title III	
	Million dollars			
1966	63.75	9.91	--	73.66
1967	103.26	1.80	--	105.06
1968	167.43	0.18	--	167.61
1969	39.32	1.53	--	40.85
1970	72.67	3.98	--	76.65
Total	398.38	5.46	3.11	463.83

1/ Includes East Pakistan (now Bangladesh). Data are for years ending June 30.

2/ PL 480 consists of three titles. Title I is concessional sales, title II is donation and disaster relief, and title III is barter.

Source: (36).

Most foreign economic assistance is channeled through the Pakistan Consortium which was organized in 1960 by the World Bank. In addition to the World Bank and its subsidiary, the International Development Association, consortium members include Belgium, Canada, France, the Federal Republic of Germany, Italy, Japan, the Netherlands, Norway, Sweden, the United Kingdom, and the United States.

The United States has been the largest contributor of economic assistance to Pakistan. U.S. assistance is provided under various programs, but primarily through development grants, development loans, commodity assistance, and PL 480.

Under PL 480, Pakistan has received shipments of U.S. agricultural commodities, primarily foodgrains (table 9). Up to 1966/67, specified surplus agricultural commodities were available to Pakistan under PL 480 with payment in local currencies. Since 1967/68, a portion of the PL 480 commodities has to be paid for in dollars, with payment spread over a period of 40 years and the first payment due 10 years after the date of delivery of commodities. Outstanding amounts carry an interest payment of 2 percent during the first 10 years and 3 percent during the next 30 years.

PROBLEMS IN FUTURE AGRICULTURAL DEVELOPMENT

The agricultural development potential of Pakistan is quite substantial, but there are serious obstacles in the way. Many farms are small and fragmented. The farmers' poverty is often so acute that they are unable to make required financial investments or obtain institutional credit. Their educational limitations make the managing of the new technology difficult.

Small Farm Size and Land Fragmentation

Certainly one of the major impediments to further agricultural development in Pakistan is the large number of uneconomically small land holdings. The 1960 census showed that 3,743,587 farms (77 percent of all farms) had less than 5 hectares. Together they had only 33 percent of the farmland in Pakistan. Subsistence farmers invest in their own labor and their family's labor, but are so poor that monetary investment in new technology is impossible.

Inadequate Credit Supply

The supply of agricultural credit in Pakistan is far short of the amount needed. The present credit institutions have improved considerably during the last decade, but the amount of institutional credit available is still much less than noninstitutional credit. After friends and relatives, the major portion of credit is still supplied by the local moneylender. Interest rates on these loans are very high because of the relatively small size of the loans and the high risk of default.

Agricultural credit institutions, primarily the Agricultural Development Bank and Agricultural Cooperative Societies, reach fewer than 20 percent of the farmers. Credit institutions are too underfinanced and understaffed to

handle properly the massive task of farm credit. The cooperatives are beset with serious organizational, management, and operating problems. The Agricultural Development Bank and its branches appear to be well-managed and financially stable, but there are only 50 branches and subbranches scattered over Pakistan's rural areas.

Production of one Mexi-Pak wheat crop requires about three bags of nitrogen and half a bag of phosphate per hectare, two or three spray applications of insecticide, water, and other miscellaneous inputs. The minimum cash outlay is at least PRs. 100-120 per hectare, excluding seed costs. Tractors and tubewells are beyond the reach of most small farmers.

Historically, nearly all loans from Government-controlled institutions must be backed by collateral. However, many subsistence farmers have little or no collateral to offer and have to obtain credit from private sources. In the fourth Five-Year Plan, credit agencies are encouraged to increase loans, particularly to the smaller farmers for productive purposes. Marketing institutions are encouraged to become more efficient and thus increase the farmer's share of the ultimate selling price of his produce. Nevertheless, economic advancement among the many subsistence farmers will be a slow process.

Poor Marketing Channels

While industrial production in Pakistan is concentrated in factories near the market, agricultural production is scattered in remote rural areas far from the market. The market is made even more inaccessible by poor roads and lack of transport facilities. Thus, the farmer is a captive of his local village market, which seldom gives him a fair price for his harvest.

Another marketing problem is rural indebtedness. To settle his debts, the farmer must sell his crop immediately after harvest, when the price is lowest. There is yet another problem--the lack of warehousing and storage facilities for grains. The farmer has none of his own and grain storage facilities in cities are inadequate, which forces the farmer to sell his crop immediately before weather or pests destroy it.

Extensive investments in farm-to-market roads, expanded credit facilities, and more food storage bins are needed to alleviate these problems.

Problems of Mechanization

Mechanizing the agriculture of a nontechnical society like that of Pakistan has its special problems: inability of the farmers to operate machines properly and to make simple repairs in the field, lack of skilled repairmen, and inadequate facilities such as garages and fuel stations. Under these conditions, the mechanization does not give the full return on the capital investment and is not fully utilized.

Machinery is culturally alien to the rural population of Pakistan. Machinery handled by untrained drivers results not only in poor performance, but in

damage to the machinery itself. Sometimes machinery that served well in its country of origin is unsatisfactory in Pakistan because of the operator's unfamiliarity with machinery.

A minor breakdown in the field is a crisis because the farmer does not know how to make even simple repairs. Knowledgeable mechanics are in short supply and prefer to stay in the cities and towns. Farm roads are bad and it is difficult to get the tractors out to the few existing repair shops. Because Pakistan does not manufacture farm machinery, it is imported, and usually at a high cost. Most dealers do not import sufficient spare parts along with the tractors, creating repair bottlenecks.

The high cost of fuel and lubricating oil is another obstacle. Sometimes fuel depots are as much as 40 miles away from the farms. It is very hard to get fuel at short notice. Fuel and lubricating oils are so costly that the farmer is tempted to use the lower, cheaper grades, which causes premature wearing out of the machinery.

To overcome these obstacles, Pakistan will need to train many more mechanics and operators and improve supporting facilities such as repair shops and fuel depots.

Soil Salinity and Waterlogging

The major irrigated area of Pakistan, located in the Indus Basin, is in very serious trouble because of salinity and waterlogging. Most of the irrigated area covers a deep rift valley which has become filled with alluvium over the ages. Due to the nature of its creation, the area is poorly drained in many places. The Indus Basin is semi-arid and, like most such areas of the world, its soils tend to be alkaline.

The poor drainage and alkaline soils, coupled with irrigation and poor soil management have resulted in salinity and waterlogging. Salts have increasingly become concentrated on the surface and in the upper layers of the soils by capillary attraction and evaporation. The soil is cultivated to a depth of only 4 to 5 inches and the land is then lightly irrigated, with the water moistening only the top layer of the soil and drawing the salts to the surface rather than washing them below the root zone.

To leach out the salts, it is necessary to apply 20 percent more water than is normally required for maximum crop production. Leaching cannot be effectively carried out if the cultural practice of always plowing at the same depth has created a hardpan, in which case the water cannot penetrate to lower depths. Leaching also cannot be effectively carried out if the water table is too high or poor drainage exists. In both cases, drainage is essential.

Water tables have been rising steadily in Pakistan because of the lack of subterranean drainage. In addition, most canals are unlined and water seeps out into the fields, causing the water tables to rise even more. Approximately 10 percent of the irrigated land has gone out of production, another 10 percent is badly deteriorated, and about 40 percent of the remaining land is

threatened. The problem can be remedied by installation of tubewells and surface and seepage drains, by lining canals, and by improving cultural practices, especially changing plowing depth periodically.

Waterlogging and salinity are two very serious problems that will face Pakistan in the future and remedies are going to be costly.

TRENDS IN AGRICULTURAL EXPORTS AND IMPORTS

Foreign exchange earnings are of critical importance to a country keen on importing capital goods for industrial development. Disagreement between East Pakistan and West Pakistan on the allocation of foreign exchange earnings from jute exports was one of the major underlying causes of the 1970-71 conflict between these two areas.

Pakistan's total exports increased from about $253 million in 1965/66 to $420 million in 1970/71 (table 10). Basmati rice and raw cotton are the two major agricultural exports. Cotton fabrics, cotton twine and yarn, and leather accounted for nearly 40 percent of the country's total exports in 1970/71.

Most of the Basmati rice, which is a premimum rice, is exported to the Middle East and Arabian Peninsula markets. Basmati is also exported to the United Kingdom and the U.S.S.R. The U.S.S.R. accounted for almost one-fourth of Pakistan's total Basmati exports in 1970/71. Kuwait, Kenya, and Bahrain are also major markets for Basmati rice.

In 1970/71, Hong Kong and Japan accounted for almost 60 percent of Pakistan's exports of raw cotton. The United States and the United Kingdom accounted for about one-sixth and one-fourth, respectively, of the country's cotton fabric exports. Other important markets for cotton fabrics were Poland, Bulgaria, Czechoslovakia, and Afghanistan. Hong Kong accounted for almost one-third of the cotton yarn exports and Singapore for about one-sixth. Poland, Indonesia, Japan, and the People's Republic of China are other important markets for cotton yarn.

Trade Between Pakistan and Bangladesh

Trade between Pakistan and Bangladesh ceased with the political unrest that occurred in December 1971 between the two areas--formerly West Pakistan and East Pakistan. Prior to that time, East Pakistan had been the major market of West Pakistan's exports and trade between the two areas had increased significantly.

East Pakistan's imports from West Pakistan totaled $289 million in 1970/71, compared with $254 million in 1965/66 (table 11). Cotton, cotton products, rice, tobacco, tobacco manufactures, and oilseeds constituted the bulk of these imports.

West Pakistan's imports from East Pakistan reached a peak of $192.4 million in 1969/70, but fell to $169 million in 1970/71 (table 12). Tea was the

Table 10--Value of Pakistan's agricultural and agriculturally related exports, 1966-71 1/

Commodity	1966	1967	1968	1969	1970	1971
	1,000 dollars					
Rice (Basmati)	27,840	36,954	31,386	32,596	19,724	36,336
Other food	19,962	23,007	19,893	22,454	29,156	38,665
Total food	47,802	59,961	51,279	55,050	48,880	75,001
Wool	15,088	8,778	9,000	9,984	6,843	5,084
Raw cotton	62,715	64,125	96,204	76,511	47,004	59,935
Hides and skins	2,868	1,510	1,054	803	3,691	3,503
Tobacco	143	216	2,780	3,309	3,466	3,021
Vegetable materials	9,222	8,595	7,364	7,851	9,635	11,106
Cotton fabrics	31,072	34,504	40,761	47,492	54,122	65,362
Cotton twines and yarns	21,467	24,276	44,370	43,639	53,370	74,988
Leather	15,735	5,518	17,602	23,917	22,954	22,485
Subtotal	206,112	207,483	270,414	268,556	249,965	320,485
Other	46,742	73,619	75,126	88,562	87,962	99,347
Total	252,854	281,102	345,540	357,118	337,927	419,832

1/ Data are for years ending June 30 and exclude sales to Bangladesh, formerly East Pakistan.
Source: (11).

major commodity imported, followed by paper, paper products, and jute bags.

Future trade between Pakistan and Bangladesh will depend, in large part, on political rapproachement between the two areas. Meanwhile, Pakistan will undoubtedly have to find new export markets for raw materials and finished goods and new sources of supply for some imports.

Trade Agreements

Whenever possible, Pakistan's trade agreements are limited to commodity exchange (barter) to conserve foreign exchange. Major trade agreements in recent years have been largely with communist countries.

A general barter agreement, valid for 5 years, was concluded with the U.S.S.R. in December 1970. Imports from the U.S.S.R. will be machinery,

Table 11--Exports of selected commodities by West Pakistan (now Pakistan) to East Pakistan (now Bangladesh), by value, 1966-71 1/

Commodity	1966	1967	1968	1969	1970	1971
			1,000 dollars			
Rice	31,017	29,372	18,801	20,540	57,832	48,885
Cotton, raw	28,650	19,700	25,415	33,147	34,888	27,968
Cotton, textiles	38,522	46,437	40,918	43,519	60,906	46,448
Cotton twist	21,420	11,955	10,633	12,865	18,125	15,004
Tobacco (manufactured and unmanufactured)	13,935	25,527	28,337	25,964	30,318	31,868
Chemicals	501	544	1,874	3,190	3,268	2,800
Rape and mustard seed	26,768	18,866	24,104	22,866	25,132	21,344
Subtotal	160,813	152,401	150,082	162,091	220,469	194,317
Other	93,086	125,912	108,979	119,938	129,719	95,093
Grand total	253,899	278,313	259,061	282,029	350,188	289,410

1/ Data are for years ending June 30. Source: (11).

Table 12--Imports of selected commodities by West Pakistan (now Pakistan) from East Pakistan (now Bangladesh), by value, 1966-71 1/

Commodity	1966	1967	1968	1969	1970	1971
			1,000 dollars			
Tea	50,796	59,096	48,081	54,007	51,118	57,652
Jute bags	20,717	19,937	22,979	22,561	23,305	15,249
Gunny cloth	5,773	5,991	6,294	6,694	6,743	6,702
Jute rope and twine	645	2,217	2,624	3,651	2,885	2,854
Matches	8,337	6,194	6,656	8,962	9,404	8,473
Paper and paper products	16,564	16,028	19,123	23,029	22,922	19,139
Leather	4,877	5,082	5,798	6,229	5,903	4,505
Subtotal	107,709	114,545	111,555	124,833	122,280	114,574
Other	29,220	40,686	53,344	58,210	70,174	54,279
Grand total	136,929	155,231	164,899	183,043	192,454	168,853

1/ Data are for years ending June 30. Source: (11).

industrial goods, and raw materials such as pig iron and billets. Pakistan's exports to Russia will include--apart from traditional commodities such as rice and cotton and jute products--thermosflasks, surgical gloves, and leather goods. This is the third trade agreement with the U.S.S.R., with previous agreements being negotiated in 1965 and 1968.

In February 1971, Pakistan and Yugoslavia signed a 1-year barter deal which provided for an exchange of goods worth $10.5 million on each side. Significant items to be exported by Pakistan include Basmati rice and raw cotton. Under an agreement signed in June 1971, Pakistan will export raw cotton, cotton manufactured goods, leather goods, and rice to Poland. Imports from Poland will consist of coal, coke, chemicals, pesticides, and other industrial goods. A September 1970 agreement with Bulgaria specified Pakistan's imports as including pesticides and insecticides, chemicals, and industrial goods. Exports to Bulgaria would include raw cotton, cotton manufactures, oil cake, cottonseed, and miscellaneous manufactured goods. An agreement with Czechoslovakia provides for Pakistani exports of raw and manufactured cotton, leather and leather products, tobacco, cigarettes, fruit juices, and other goods.

Three separate barter contracts have been signed during the last 5 years with the People's Republic of China for exports to Pakistan of rice, tea, and coke against imports from Pakistan of raw cotton and cotton manufactured goods.

Many trade agreements between the United States and Pakistan have been signed. Major items exported under PL 480 have included wheat, soybeans, tobacco, and extra-long staple cotton. Pakistan's exports to the United States under trade agreements have been industrial goods.

Direction of Trade

The composition and direction of Pakistan's exports and imports have changed considerably in recent years (table 13). The direction of trade seems to be shifting toward Eastern Europe and the Middle East and away from North America and Western Europe. In 1971, however, North America and Western Europe each still accounted for approximately one-third of Pakistan's imports. The share of Pakistan's exports going to these two regions has declined since 1965, and amounted in 1971 to 7 percent for North America and 21 percent for Western Europe. Pakistan's major trading partner in North America is the United States and in Western Europe, the United Kingdom.

Trade between Pakistan and Eastern Europe has changed radically since 1965. The share of Pakistan's imports from Eastern Europe increased from less than 4 percent in 1965 to nearly 9 percent in 1971. Pakistan's exports to Eastern Europe accounted for 2 percent of total exports in 1965 but rose to nearly one-fifth of the total in 1971. This trade expansion is due to Eastern Europe's willingness to deal on the basis of barter and commodity exchange agreements.

The largest share of Pakistan exports goes to the Far East--nearly 35 percent in 1971 (mostly cotton and cotton fabrics). However, this share has been declining and has dropped even more sharply than the share of exports going to

Table 13--Regional percentage distribution of Pakistan's exports and imports, 1965, 1968, and 1971 1/

Region	Exports			Imports		
	1965	1968	1971	1965	1968	1971
	Percent					
North America	9.6	6.2	7.0	44.2	35.6	31.8
United States	(8.4)	(5.6)	(6.3)	(42.4)	(33.0)	(28.6)
Western Europe	23.0	26.0	20.8	37.5	34.8	34.3
United Kingdom	(13.0)	(12.5)	(9.4)	(13.2)	(12.1)	(11.2)
Eastern Europe	2.0	9.8	19.0	3.9	7.4	8.7
Middle East	13.0	15.9	14.0	1.2	6.8	7.4
Other Africa	4.0	2.2	2.1	.4	.3	.2
Far East	47.0	38.5	34.9	11.7	14.2	16.6
Oceania and others	1.4	1.4	2.2	1.1	.9	1.0
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

Source: (11).

North America or Western Europe. The share of exports going to the Middle East has held relatively stable at around 15 percent.

CONSTRAINTS ON AGRICULTURAL EXPORTS AND IMPORTS

Expansion of exports is generally viewed as an essential ingredient in economic development. Exports are necessary for earning foreign exchange for imports of needed technologies and capital goods. This section of the report discusses some existing constraints on the expansion of agricultural exports and on needed imports.

Competition in Export Markets

Cotton and cotton products are the major source of Pakistan's foreign exchange earnings. Over the past two decades, however, cotton has faced increased competition from synthetics. Its share in the world consumption of apparel fibers fell from 69 percent in 1957 to 54 percent in 1969 (table 14). Synthetic fibers accounted for one-fifth of the world consumption of apparel fibers in 1957, 29 percent in 1964, and 39 percent in 1969. Synthetics are rapidly replacing hard fibers in the rope and cordage market. They are also competing

Table 14--World consumption of apparel fibers, by type, 1957-69

Year	Wool	Cotton	Synthetics 1/	Silk	Total
			Million pounds		
1957	2,939	30,525	6,353	48	29,865
1958	2,741	21,054	5,961	41	29,799
1959	3,178	22,377	6,822	54	32,431
1960	3,304	22,840	7,299	54	33,495
1961	3,331	22,245	7,768	50	33,394
1962	3,336	21,782	8,704	52	33,874
1963	3,324	22,046	9,663	46	35,079
1964	3,203	23,402	11,020	53	37,678
1965	3,277	24,071	11,930	56	39,334
1966	3,396	24,733	12,905	58	41,092
1967	3,244	24,985	13,694	60	41,983
1968	3,408	25,216	16,164	60	44,848
1969	3,510	25,300	17,572	65	46,447
			Percent		
1957	10	69	21	--	100
1958	9	71	20	--	100
1959	10	69	21	--	100
1960	10	68	22	--	100
1961	10	67	23	--	100
1962	10	64	26	--	100
1963	9	63	27	--	100
1964	9	62	29	--	100
1965	8	61	31	--	100
1966	8	60	31	--	100
1967	8	59	33	--	100
1968	8	56	36	--	100
1969	8	54	39	--	100

-- Means less than half of 1 percent.

1/ Synthetics include rayon filament, rayon staple fiber, and noncellulosic manmade fiber.

Source: (5, p. 22).

with jute in coarse woven fabrics for sacking and as a backing cloth for tufted carpets.

Pakistan also produces wool for export. The share of wool in world fiber consumption fell from 10 to 8 percent between 1957 and 1965. Since 1965, wool has maintained its share of the growing consumption of apparel fibers. However, wool prices also fell to low levels in recent years.

Limited Foreign Exchange for Imports

Pakistan is an agricultural country with very little industrial development. Thus, agricultural exports account for most of the country's foreign exchange earnings. Since many of the agricultural commodities face keen competition, the margin of profit tends to be low and Pakistan has not been able to earn sufficient foreign exchange for purposes of economic development.

Development capital has, to a large extent, been supplied to Pakistan by foreign aid, grants, and loans. This economic assistance, however, has increasingly been in the form of loans rather than grants. As a result, Pakistan's foreign debt has been rising, and its claim on foreign exchange earnings is increasing. Pakistan's foreign debt position as of June 30, 1972, is shown in table 15.

The increase in public debt has been more pronounced in recent years, despite the fact that the value of foreign assistance received during the third plan (1965-70) fell 24 percent short of projections. Debt servicing costs have accelerated (table 16), offsetting the rise in foreign exchange earnings. While the average rate of interest on foreign loans has gone up by 50 percent --from 2.6 to 3.9--in the last 5 years, the average grace period and the maturity period of loans have been sharply reduced. In 1970/71, debt service amortization was an estimated 21.5 percent of the foreign exchange earnings, compared with 9.9 percent in 1964/65.

Currency Exchange Problems

For more than a decade, Pakistan has had a complex trade and exchange system involving fluctuating multiple exchange rates. This exchange system is sound in theory, but it has not worked satisfactorily. The primary causes of exchange policy failures are difficulty in understanding and administering the system and high rates of capital flight by the business community. Capital flight and speculation have been reflected in such activities as overinvoicing of imports and underinvoicing of exports, delays in export shipments, and stockpiling of imported goods. Because of such practices, the exchange rate of the Pakistani rupee in the black market has depreciated, and remittances have been leaking away from official channels. This problem is not at all peculiar to Pakistan, and is very common to most of the developing countries.

To minimize the balance-of-payment problems, the Government has tried to introduce certain monetary reforms from time to time. Attempts have been made to simplify and reform the currency exchange system and to improve the Export

Table 15--Foreign debts of Pakistan, June 30, 1970

Item	Loans repayable in foreign exchange	Loans repayable in rupees	Total
		Million dollars	
Contracted	4,754.5	304.2	5,068.7
Disbursed	3,625.4	304.2	3,929.6
Repaid	680.0	72.9	752.9
Outstanding	2,959.2	231.3	3,190.5
Interest paid	343.7	84.2	427.9

Source: (10, p. 67).

Table 16--Foreign exchange earnings, debt service costs, and their ratio, Pakistan, 1965-71 1/

Year	Foreign exchange earnings	External debt costs	Debt service Foreign exchange
	Million dollars		Percent
1965	629.1	62.2	9.9
1966	686.8	73.7	10.7
1967	728.0	95.7	13.1
1968	800.6	108.4	13.5
1969	882.6	154.5	17.5
1970	900.9	175.5	19.5
1971 2/	833.3	179.1	21.5

1/ Data are for years ending June 30. 2/ Estimated.
Source: (10, p. 68).

Bonus Scheme. However, these reforms have barely begun to solve the foreign currency exchange problems.

On May 12, 1972, the Pakistani Government devalued its currency from PRs. 4.76 per U.S. dollar to PRs. 11.0 per U.S. dollar. This devaluation will improve Pakistan's balance of payments by establishing a more realistic rate of exchange. The new exchange rate has superseded all previous bonus vouchers and preferred rates of exchange.

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Appendix table 1--Population and GNP of Pakistan and Bangladesh, 1961-71

Year	Population		Gross national product 1/	
	Pakistan	Bangladesh	Total	Per capita
	Thousands		Billion dollars	Dollars
1961	46,800	55,970	10.6	102
1962	48,020	57,420	11.0	103
1963	49,255	58,920	12.0	109
1964	50,535	60,450	12.7	113
1965	51,855	62,070	13.3	115
1966	53,205	63,795	14.0	118
1967	54,590	65,570	15.1	124
1968	56,015	67,390	16.7	125
1969	57,470	69,270	16.5	129
1970	59,000	71,230	17.2	130
1971	60,460	73,290	17.4 est.	130

1/ Data are for Pakistan and Bangladesh combined.

Source: Unpublished population data from U.S. Dept. of Agr., Econ. Res. Serv., Foreign Demand and Competition Div.; GNP data from (26).

Appendix table 2--Indices of agricultural & food production, Pakistan, 1961-71

Item	Agricultural		Food	
	Total	Per capita	Total	Per capita
	Index 1961-65 = 100			
1961	87	92	88	93
1962	95	97	94	97
1963	105	105	105	105
1964	103	99	103	100
1965	110	105	110	105
1966	113	105	110	102
1967	124	112	119	107
1968	139	122	137	120
1969	149	127	150	128
1970	157	131	159	132
1971	151	122	151	122
1972	160	126	153	121
	Percent			
Annual rate of increase 1961-71	5.6	2.9	5.6	2.9

Source: Unpublished data from U.S. Dept. of Agr., Econ. Res. Serv., Foreign Demand and Competition Div., Statistics Branch.

Appendix table 3--Irrigated arable land and method of irrigation, Pakistan, 1962-67 1/

Item	1962	1963	1964	1965	1966	1967
			1,000 hectares			
Total arable land...	16,880	17,175	17,301	18,746	19,264	19,693
Irrigated.....	10,751	11,007	11,046	11,440	11,472	12,091
Nonirrigated.....	6,129	6,168	6,255	7,306	7,792	7,602
			Percent			
Irrigated as percent of total.....	63.7	64.0	63.8	61.0	59.6	61.4
Percent of irrigated land irrigated by:						
Canals.....	84.1	82.5	80.1	78.6	75.8	73.7
Wells.....	8.6	8.1	9.1	8.9	8.3	8.3
Tubewells.....	2.4	4.0	4.1	4.7	6.9	6.3
Other.....	4.9	5.4	6.7	7.8	9.0	11.7
TOTAL.....	100	100	100	100	100	100

1/ Data are for years ending June 30.
Source: (12).

Appendix table 4--Pakistan's rice exports, by selected destinations, volume, value, and average price per ton, 1966-71 1/

Year	Kuwait		Other Arabian Peninsula		U.S.S.R.	
	Metric tons	1,000 dollars	Metric tons	1,000 dollars	Metric tons	1,000 dollars
1966	27,948	5,154	52,014	9,924	39,126	7,784
1967	36,147	7,574	39,124	8,213	83,638	16,749
1968	19,669	5,253	55,923	14,695	29,828	7,232
1969	34,384	9,332	35,947	9,701	25,399	5,612
1970	18,730	4,398	55,652	12,115	--	--
1971	24,623	5,210	70,149	15,843	45,929	8,619
	U.S. dollars per metric ton					
1966	184.41		190.79		198.95	
1967	209.53		209.92		200.25	
1968	267.07		262.77		242.46	
1969	271.40		269.87		220.95	
1970	234.81		217.69		--	
1971	211.59		225.84		187.66	

Year	United Kingdom		Other		Total	
	Metric tons	1,000 dollars	Metric tons	1,000 dollars	Metric tons	1,000 dollars
1966	5,878	945	22,995	4,033	147,961	27,840
1967	1,628	500	20,819	3,918	181,356	36,954
1968	3,654	971	12,668	3,235	121,742	31,386
1969	6,341	1,671	38,012	6,280	140,083	32,596
1970	6,101	899	10,427	2,312	90,910	19,724
1971	5,295	967	36,188	5,697	182,184	36,336
	U.S. dollars per metric ton					
1966	160.77		175.38		188.16	
1967	307.12		188.19		203.76	
1968	265.74		255.37		257.81	
1969	263.52		165.21		232.69	
1970	147.35		221.73		216.96	
1971	182.62		157.43		199.45	

1/ Data are for years ending June 30.
Source: (11).

Appendix table 5--Value of Pakistan's cotton and cotton product exports, by major destination, 1966-71 1/

Destination	1966	1967	1968	1969	1970	1971
	1,000 dollars					
Cotton:						
United States	535	355	718	595	171	500
United Kingdom	3,622	2,496	7,212	5,850	1,253	1,108
Poland	3,679	3,075	3,802	3,914	4,311	5,038
U.S.S.R.	1,050	2,612	2,456	3,877	5,994	3,703
Yugoslavia	414	2,356	2,983	6,830	868	3,844
Hong Kong	14,554	15,304	24,764	15,801	9,642	16,860
Japan	14,075	8,982	17,159	10,175	7,284	16,780
North Korea	--	--	--	--	1,117	1,101
Belgium	677	256	2,101	1,175	731	999
People's Republic of China	12,096	16,841	9,058	12,659	5,508	1,283
Burma	--	--	--	24	1,429	1,670
Afghanistan	--	--	--	4	--	--
Singapore	182	459	463	409	329	899
Canada	28	24	16	22	--	13
Australia	221	185	252	269	331	346
Sri Lanka	--	1,390	25	5	116	520
Indonesia	2,912	--	--	--	--	--
Czechoslovakia	--	146	538	1,808	514	469
Total	58,224	60,542	92,489	72,597	44,050	56,713
	1966	1967	1968	1969	1970	1971 2/
	1,000 dollars					
Cotton products:						
United States	6,735	8,259	5,933	9,022	9,029	9,872
United Kingdom	7,708	11,375	12,070	11,047	10,960	17,161
Poland	680	910	1,231	7,488	11,603	11,562
U.S.S.R.	1,575	1,541	3,186	2,628	3,608	7,869
Yugoslavia	437	32	7	20	3,542	1,853
Hong Kong	7,271	10,658	17,662	22,308	20,740	32,900
Japan	1,244	2,444	14,260	3,365	2,762	9,827
North Korea	--	--	89	13	--	--
Belgium	127	435	327	423	103	161
People's Republic of China	2,868	677	11	1,129	1,763	3,309
Burma	2,524	6,030	3,364	3,441	1,480	23
Afghanistan	2,891	3,812	2,330	2,562	2,578	1,236
Singapore	489	3,071	8,220	9,616	12,577	10,499
Canada	748	850	1,409	1,615	1,496	2,024
Australia	418	648	1,447	1,321	1,551	1,567
Sri Lanka	2,002	2,674	1,286	868	796	1,311
Indonesia	11,593	231	887	1,768	4,519	4,097
Czechoslovakia	--	115	1,108	1,974	2,816	6,001
Total	56,686	61,717	88,505	94,811	110,365	145,305

1/ Data are for years ending June 30. 2/ Estimated.

Source: (11). Data converted from rupees to U.S. dollars at current exchange rates.

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