CENTO CONFERENCE

On

National & Regional Agricultural Development Policy - Istanbul, Turkey.

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PAPERS

By

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MINISTRY OF AGRICULTURE AND WORKS.

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COUNTRY STATEMENT BY MR. M. YAMIN QURESHI, S.K., GAR., JOINT SECRETARY TO THE GOVERNMENT OF PAKISTAN, MINISTRY OF AGRICULTURE, AND HEAD OF PAKISTAN DELEGATION TO THE CENTO CONFERENCE ON NATIONAL & REGIONAL AGRICULTURAL DEVELOPMENT POLICY - ISTANBUL (TURKEY) - SEPTEMBER 10-16, 1967

Mr. Chairman and distinguished delegates:

My delegation takes this opportunity to thank the CENTO for organizing this Conference on a subject which is of the greatest importance to the member-countries of the region. We are meeting in the historic city of Instanbul, on the bank of the Bosphorus with our comrades, to share each other's experiences to our mutual advantage. We are grateful to the Government of the United States of America for their valuable assistance in planning and financing this Conference. Our profound thanks are also due to the Government of Turkey for hosting this important Conference and making elaborate arrangements for the comfort of the delegates.

We are indeed very happy to be with erudite delegates from friendly countries, who have assembled here to analyse the policies and programmes of each country during the past few years to determine factors that prompted an increase in agricultural production and to consider further measures, both on national and regional level, which may be adopted to ensure a high annual growth in agriculture.

The vital position of agriculture has been duly recognized by the Government of Pakistan during the current Five Year Plan which states that "the development agriculture is the sine que non to the development of country's economy and gives the highest priority to agriculture". It is fully recognised that the development of the Industrial Sector itself dëpends on the prosperity of the Agriculture Sector as the rural population which is in over-whelming majority, is the ultimate consumer of the manufactured items.

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Before 1960, agricultural growth in Pakistan could not keep pace with the requirements of our growing population. A healthy upward trend has been set up since then. The rate of growth of the agricultural sector during 1960-65 was 3.4 per cent as compared to 1.3 per cent under the preceding quinquennium. The Agricultural Programme drawn up for 1965-70 contemplated a further acceleration in the growth rate of agriculture from 3.4 per cent to 5 per cent, mainly through increased agricultural production inputs. In the first two years, the weather conditions were severely adverse and the growth rate achieved was only 1.6 per cent in 1965-66 and 3.1 per cent in 1966-67. We have, therefore, to strive hard during the remaining three years of the Plan to step up the growth rate to over 6 per cent per annum to make up the short-fall in the first two years. The President of Pakistan is giving top priority to agriculture. The two Provincial Governments and the Central Government are striving hard to draw up and implement sizeable but practicable Action Programmes to increase agricultural production. Accordingly, an Action Programme has been drawn up under the 'Grow More Food Campaign' in East Pakistan. The average consumption of foodgrains in East Pakistan is about 16 ozs. per capita. On this basis, the total requirements by 1969-70 will be 12.72 million tons per annum for East Pakistan. Assuming an increased consumption of 2% due to increased income and adding 500,000 tons as running reserve, the total production requirements in 1969-70 will be 13.46 million tons. This calculation is based on the projected population of 70.21 million by mid 1969-70. It is planned to achieve this target of self-sufficiency mainly by bringing 700,000 acres of Boro crop and early Aus crop under IRRI rice by the end of the Plan, and by providing

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additional fertilizers to meet the full increased fertilization requirements for the IRRI rice and the Mexi-Pak wheat.

For the year 1967-68, a workable Action Programme has been drawn up which lays down production targets of rice at 10.9 million tons as against the current year's production of 9.2 million tons. Increased targets for wheat and other foodgrains, edible oils, fruits, potatoes and vegetables have also been laid down. These targets have been split up district-wise and are proposed to be achieved inter alia through the following measures:

(i) Irrigation 551,500 acres by low-lift pumps of Agricultural Development Corporation.

(ii) Covering 100,000 acres with IRRI rice seed producing 110,000 tons of rice.

(iii) Distribution of 20,000 maunds of Mexican wheat seed which will cover 30,000 acres bringing approximately 18,000 tons of wheat.

(iv) Providing additional 319,420 tons of fertilizers for rice, Mexican wheat and other crops.

(v) Providing additional irrigation water by East Pakistan WAPDA to 145,000 acres.

(vi) Protecting 500,000 acres under coastal embankment programme.

(vii) Plant protection coverage to 5,960,000 lakh spray acres and treatment of about 480,000 seed against seed borne diseases.

The East Pakistan's programme of self-sufficiency in foodgrains is expected to be achieved by the end of the Third Five Year Plan.

The target of jute production has been raised to 750,000 bales which involves an increase of about 25% in the production of this exchange earning commodity. We propose to achieve this target by intensified cultivation and without diverting any area from rice.

/In West

In West Pakistan attention is being paid to increasing production of all the Kharif crops during the current year. Against the expected yield of about 2,500,000 bales of cotton during 1966-67, the target of cotton production during 1967-68 has been rasied to 2,800,000 bales. This target is proposed to be achieved by the application of additional 150,000 tons of fertilizers, extension of plant protection coverage and by a concerted drive on these two inputs in a number of selected districts which are most suitable for the cotton crop.

Pakistan has been exporting the fine varieties of rice produced in West Pakistan for some years and earning valuable foreign exchange from this commodity. Its FOB price this year has been fixed at £ 85 to 90 per ton. During the year 1966-67, the estimated output of fine rice varieties was 450,000 tons of cleaned rice. Production target for the coming Kharif crop has been fixed at 600,000 tons involving an increase of 25 per cent. The strategy to be adopted will be the application of additional quantities of fertilizers and extension of the plant protection coverage in the Basmati producing zone.

The target of maize has also been raised to 800,000 tons for the coming Kharif season as against 680,000 tons during 1966-67 Kharif season. Fertilizer requirements for this additional production has been assessed at 90,000 tons. Of this, 80,000 tons would be required for the Hybrid/ Synthetic varieties at four bags per acre and 10,000 tons for the traditional varieties. The plant protection coverage is planned for at least 400,000 acres.

For attaining self-sufficiency in wheat by the end of 3rd Five Year Plan, targets of wheat production have been

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decided as follows:

1967-68	----	5.4 million tons
1968-69	----	6.1 million tons
1969-70	----	7.0 million tons

These have been further broken up in the district wise targets for the sake of administrative convenience. For achieving these targets, it is proposed to put 2 million acres under the Mexican wheat during 1967-68, 3 million acres during 1968-69 and 4 million acres during 1969-70. The strategy for attaining the wheat self-sufficiency has five key elements, namely:

1) Giving fertilizer application averaging four bags per acre in terms of ammonium sulphate and providing each acre one to two additional waterings. This will involve average increase in water delta of 33%.

2) Providing additional fertilizers for 2 million irrigated acres under improved indigenous wheat varieties at the rate of one bag per acre in terms of ammonium sulphate.

3) Increasing irrigated wheat acreage by 1.5 million acres.

4) Increasing credit availability and devising a system of incentives and subsidies to ensure that input targets are in fact met.

5) Allocating funds in ADP for water and agricultural Programme of 3rd Plan on a priority basis, specially encouraging schemes linked to wheat self-sufficiency.

Since the extension of the area under the Mexican varieties of wheat is of the basic overwhelming importance, the Government of Pakistan have arranged to import 2,000 tons of Mexi-Pak wheat seed and 40,000 tons of Indus 66 variety of wheat seed from Mexico.

The application of chemical fertilizers will be stepped up to 1.3 million tons in 1967-68, 1.8 million tons in 1968-69 and 2.1 million tons in 1969-70.

Additional irrigation water will be arranged through the installation of 3,000 tubewells by the Irrigation Department,

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200 tubewells by the ADC and 40,000 by the private sector. Larger acreage of crops will be brought under plant protection measures.

Steps have already been taken to make arrangements for the import of full target requirements of fertilizers. For West Pakistan 634,900 tons of fertilizers will be imported during the year 1967-68 coupled with a local production of 300,000 tons and an expected carry-over of another 300,000 tons. The total availability of fertilizers in West Pakistan will almost cover the target of 1.3 million tons for 1967-68. Similarly, the target for East Pakistan has been fully covered.

We have made some headway in the field of agricultural research in the country. New improved varieties of wheat, namely, C271, C273, C591, 'Dirk', H68 and TJ558 have been evolved for different regions of West Pakistan. As compared to the other local varieties, these improved varieties have been found to give an increased yield of 20-25%. Our research workers also carried on experiments with Mexican varieties under the guidance of experts provided by the Rockfeller Foundation and by having a number of workers of the Research Institute trained in Mexico and through the exchange of seed materials.

As a result of extensive trials, the Mexi-Pak and the Indus 66 varieties have been selected. These varieties have a superior cooking quality and give yield as high as 80 maunds per acre. They can be very rapidly multiplied and can as such help in boosting up wheat production. We hope to achieve a revolution in agricultural production by sowing these new varieties.

In the case of rice, our research workers have evolved high yielding varieties known as DA 31 which is early maturing, DA 29 which is salt resistant, Hbj. Aman 4 & 6, Hbj. Boro 2,4,5

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and 6 in East Pakistan and C 622, Basmati 370 and Kangni 27 in West Pakistan. Of late, the rice improvement work in the country is now mostly concentrated on the introduction of IRRI varieties which give yield as high as 75-100 maunds per acre. A number of varieties suitable for the local conditions have already been selected and are under rapid multiplication. The demonstration of IRRI variety, IR8-288-3, on 10 acre block in each Thana throughout East Pakistan has been planned for their quick extension.

Research results obtained in the field of cotton improvement are most outstanding. Of the improved varieties of cotton evolved under the Pakistan Central Cotton Committee, AC-134, Lasani-11 and M4 have already been established in large areas. The new variety AC-307 has also come into general cultivation. The recently evolved new variety M100, gives, at least, a maund more of cotton per acre as compared with the existing commercial variety known as M4 in the southern zone. There are nearly 900,000 acres under M4 in Sind. By the introduction of M100 to replace M4 variety, the southern zone will be able to produce 900,000 maunds more cotton and this, when valued at Rs.30/- a maund, will amount to Rs.27 million over the existing amount received by the growers. With the introduction of more and more new varieties, the per acre production of 1.6 maunds of lint in 1921-22 increased to 2 maunds in 1946-47. In 1950-51, it further increased to 2.3 maunds, in 1960-61 to 2.6 maunds and in 1964-65 to 2.8 maunds per acre. Achievement in staple length has also been remarkable and crossed the barrier from 1 inch to 1.25 inches in a new variety.

New varieties of Jute, namely, C-5, C-6, O-2, and O-3 have been evolved in East Pakistan. These have been found to give 7 to 10 per cent higher yields than the standard varieties,

D-154 and C.G. The new varieties are being rapidly multiplied to replace the old ones.

Our production of sugarcane almost doubled during the Second Plan period mainly due to some promising varieties having been established by the Central Sugarcane Research Institute at Ishurdi, East Pakistan, and some new varieties have also been released in West Pakistan. Recently, the Agricultural Research Council has imported newly improved sugarcane cuttings from the Hawaian Institute at a cost of about 5,000 dollars. These varieties are under trial at various research stations.

Useful research has already been done in the case of potato, fruits and oil seeds.

Insect pests and diseases cause heavy loss to crop production. As a result of extensive studies and experiments, effective curative and protective measures have been evolved. The application of new techniques and new pesticides is also being resorted to. About 10 million acres were covered by plant protection measures, curative and preventive in 1964-65. This area is expected to increase to 37 million acres in 1969-70. Granular pesticides are also being introduced which can be used by the farmers without any equipment. Aerial plant protection is being intensified and is proposed to be expanded.

In the field of animal husbandry, livestock diseases are one of the most limiting factors in livestock production as hundreds of thousand of animals die each year due to various diseases. Mortality figures alone do not measure the full toll of animal diseases. The loss in production of animal feed, labour and capital investment is tremendous. As a result of extensive application of research most of the livestock

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diseases have been brought under effective control. African Horse Sickness which at one time was responsible for the loss of thousand of horses has been completely eradicated. Rinderpest, which was the cattle plague in Pakistan, has been brought under most effective control. Ranikhet disease of poultry, which used to cause 90 to 100 per cent mortality has been very effectively controlled. Substantial progress has also been made in the field of livestock nutrition. As a result of extensive studies made on the subject, several livestock feed factories have been established in the country which provide balanced feed for cattle, buffaloes, poultry and horses.

Judicious exploitation of fisheries in both wings of the country has proceeded satisfactorily. Foreign exchange earnings from fisheries run into about 10 to 12 crore of rupees per annum. The exploitation of marine fisheries is receiving active consideration of the Government, both in the field of exploration and surveys as also in the development field through the private sector through the construction of large number of mechanized fishing trawlers.

In the field of forestry, research in silviculture and wood utilization has been taken up. Rubber planting has been successfully established over 3000 acres in East Pakistan and will be extended to 12,000 acres. Attempts are also being made to introduce 'biri leaf' plants. Some economic species like oil palm, cocoa and kapok are also being introduced. Studies on seasoning and strength properties of various species, and the suitability of indigenous species for veneering, pulp, chip-board, matches, pencils etc. are underway to provide valuable data for the economic use of forest wealth.

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New fertilizers factories have also been planned. Government have approved the setting up of three fertilizers factories in East Pakistan at Chittagong, Ghorasal and Khulna and two in West Pakistan at Mari and Karachi. Proposals for the establishment of four more Urea plants in West Pakistan are under consideration. The total additional annual capacity of the sanctioned plants would be 1,157,000 tons and of the balance under consideration 1,170,000 tons.

We have been getting from the Government liberal allocations of foreign exchange. As against an allocation of Rs. 88.57 million for plant protection in 1966-67, the allocation for 1967-68 stands at Rs. 102.2 million. For fertilizers, the provision for 1967-68 amounts to Rs.316 million as against Rs.172.50 million in the preceding year. For improved seeds, Rs.29.18 million have been provided as against Rs.5 million in 1966-67. Similarly, allocations under mechanization and other items have been sizeably increased.

The Government has also been taking a liberal and practical view in the matter of incentives to the farmers. Minimum support prices have been fixed for the major crops. The minimum wheat price has been fixed at Rs.17 per maund, maize price at Rs. 14.50 per maund, Basmati procurement price at Rs. 31 per maund, Begmi at Rs.20 per maund, Kangni at Rs. 19 per maund and Joshi rice at Rs.18.50 per maund. The farmers are generally afraid of a fall in prices in case of bumper production. Their interests have been fully safeguarded by these guaranteed prices on which Government will procure all the marketable surplus in case the market prices go below that level. The producer will thus get assured fair prices for their produce and will have no apprehension of their efforts

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being going financially unrewarded. The subsidy on fertilizers is also being maintained at the heavy rate of about 53 per cent in East Pakistan and 35 per cent in West Pakistan. Free plant protection service by the Central Government's aerial wing and the East Pakistan Government's free ground pest control operations will be maintained. In West Pakistan, the farmer will get at least 75 per cent subsidy in plant protection ground control measures and in the supply of pesticides.

If we are blessed with favourable weather conditions, we hope to make a break-through in agricultural production during 1967-68 and to achieve further spectacular successes by the end of the Third Five Year Plan.

Thank you.

PAPER ON ANALYSIS OF NATIONAL AGRICULTURAL PRODUCTION IN PAKISTAN PRESENTED TO THE CENTO CONFERENCE ON NATIONAL AND REGIONAL AGRICULTURAL DEVEOPMENT POLICY - ISTANBUL - SEPTEMBER 10-16,1967 BY MR.M.YAMIN QURESHI,S.K.,G.A.R., JOINT SECRETARY,MINISTRY OF AGRICULTURE

In this paper an attempt has been made to analyse the trend in agricultural production since the year 1947-48. Various factors contributing towards increasing productivity in agriculture have also been discussed. A brief review has also been made of the present state of agriculture in Pakistan and of the role it plays in the overall development of the economy so that analysis of agricultural production could be appreciated in proper perspective.

AGRICULTURE IN PAKISTAN:

Agriculture is the 'basic' industry in Pakistan which employs about 75 per cent of her civilian labour force. It also accounts for about 85 per cent of the total export earnings and contributes about 46 per cent to the Gross National Products. About 87 per cent of her population live in the villages who are dependent on agriculture in one way or the other. Agriculture in Pakistan suffers from under-production both in terms of yield per worker and per unit area. With the heavy dependence on agriculture for livelihood and consequent pressure of population on land availability of land per agriculture worker in Pakistan has been quite low i.e. 3.33 acres (in East Pakistan 1.51 acres and in West Pakistan 5.53 acres). As a result, income from farm has not mostly been adequate to provide the farmers with the basic necessities of life. Development of agriculture has, therefore, been very essential to ensure economic well being of the large farming populace. Apart from such humanitarian consideration,development of agriculture has been necessitated to facilitate steady growth and development of industries, which in turn could ensure increasing supply of consumer goods to the farmers so as to provide the latter a strong incentive to boost up agricultural product[illegible].

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II. CHARACTERISTICS OF PAKISTAN'S AGRICULTURE :

Pakistan has a total geographical area of 233.9 million acres, East Pakistan having 54.3 million acres and West Pakistan 198.6 million acres. Despite vast differences between the landed area of the two Provinces which is roughly estimated to be in the ratio of 1 : 5.7 , the difference between cultivated areas of the two Provinces is not much; the ratio is only 1 : 2.1. In East Pakistan with her rich deltaic soil, aided by heavy annual precipitation averaging about 69 inches and pressed by a heavy population, intensity of land use has gone up to 93.9 per cent. West Pakistan lies in arid and semi-arid zone and has scanty rain-fall averaging annual precipitation being 13 inches which ranges from about 4 inches in the southern to 34 inches in the northern regions; raising of crops in that Wing is mostly dependent on artificial irrigation system except in the hilly regions in the north which are rainfed. Vast tracts of land in that Wing are still to be brought under cultivation and accordingly, the intensity of land use in that Wing has been only 61.2 per cent.

III. PATTERN OF LAND UTILIZATION :

A review of area statistics shows a rising trend since 1947. During the year 1947-48 the total cultivated area of Pakistan was 58.3 million acres which rose to 69.7 million acres during 1965-66. The increase in the total cultivated area was mostly confined to the Western Wing because of the larger availability of culturable waste there. The total cultivated area in that Wing was 36.3 million acres in 1947-48 and it rose to 47.1 million acres in 1965-66 as against 22.0 million and 22.3 million acres in East Pakistan for the respective years. Besides increase in the total cultivated area, the total cropped area also increased significantly. During 1947-48 it was 54.0 million acres but it increased to 68.3 million acres by the year 1965-66, showing

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an increase of 27.8 per cent. Increase in cropped acreage has been registered in both the Wings of the country. Intensity of cropping also went up accordingly. In East Pakistan it increased from 130.2 during the year 1947-48 to 136.8 during the year 1965-66 and in West Pakistan it increased from 108.9 to 112.9 during the same period. The area sown more than once which was only 8.2 million acres during the year 1947-48 also rose to 12.4 million acres during the year 1965-66.

IV. CLASSIFICATION OF CROPS :

For the convenience of discussion, the various crops raised in Pakistan may be divided into four main crops, namely, foodgrains, cash crops, oil-seeds and others i.e. pulses, fruits, vegetables etc.

An analysis of total acreage shows that during 1947-48, 65.2 per cent of the total cropped area was under foodgrains, 11.3 per cent under cash crops, 3.2 per cent under oil-seeds and 20.3 per cent under others. With few exceptions the percentage distribution as stated above has practically remained static over years as is evident from the distribution percentage which was 65.4 for foodgrains, 11.9 for cash crops, 2.7 for oil-seeds and 20.0 for the rest during the year 1965-66. This is also indicative of the pre-dominance of foodgrains in the cropping pattern of the country, followed by cash crops.

The increase in the cropped acreage of 1965-66 over that of 1947-48 was 28 percent in case of foodgrains, 34 per cent in cash crops, 12 per cent in oilseeds and 26 per cent in case of vegetables, fruits and others. This shows that the increase in respect of cash crops has been highest followed by foodgrains. The prominence in case of cash crops may be assigned to greater demand by the expanding industries as well as for export which assured more economic returns from the cash crops.

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V. PATTERN OF AGRICULTURAL PRODUCTION :

A review of agricultural production of the country for the period 1947-48 to date shows a rising trend for almost all the crops, particularly foodgrains and cash crops. A brief description of each group is given as under :-

(A) FOODGRAINS

(I) RICE:

Rice occupies about 30 per cent of the cropped areas in East Pakistan and about 11 per cent in West Pakistan. The total acreage under rice in Pakistan increased considerably during the period under review. This is in part due to new area brought under plough and partly due to transfer of certain land from other crops to rice. During the year 1947-48 the area under rice was 20.96 million acres. The acreage under the crop during the year 1966-67 rose to 25.90 million acres, showing a rise of 23.5 per cent. Its production also rose to 10.77 million tons this year when compared to 7.42 million tons of the year 1947-48, showing an increase of 45.1 per cent. Increase in production generally was, however, more than increase in acreage which indicates that various improved inputs contributed towards increased per acre yield. With the introduction of high-yielding IRRI variety the increase in production is likely to register a sharp rise in the years to come. The quin-quenniumwise area and production of rice during 1947-48 to 1966-67 are as follows :-

Average of:	In thousand*acres	In thousand tons
First quinquennium (1947-48 to 1951-52)	21,835	7,988
Second quinquennium (1952-53 to 1956-57)	22,716	8,390
Third quinquennium (1957-58 to 1961-62)	23,789	9,385
Fourth quinquennium (1962-63 to 1966-67)	25,695	11,100
1966-67	25,897	10,767

* 2.47 acres = 1 hectare

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(2) WHEAT

Wheat is grown almost wholly in West Pakistan. During the year 1947-48 total area under wheat was reported to be 9.85 million acres which rose to 14.18 million acres during 1966-67, indicating an increase of 44.9 per cent. Its production also increased from 3.32 million tons to 4.12 million tons during the same period, showing a rise of 23.9 per cent indicating thereby that yield per acre did not increase. This trend of decrease in yield per acre appears to be due to the adverse effects of water-logging, salinity and drought. Production is, however, likely to register a sharp rise as the existing varieties are gradually replaced by the newly-introduced high-yielding Mexican varieties of wheat. The area and production of wheat during the period 1947-48 to 1966-67 were as follows :-

Average of	In thousand acres	In thousand tons.
First quinquennium (1947-48 to 1951-52)	10,122	3,627
Second quinquennium (1952-53 to 1956-57)	10,732	3,221
Third quinquennium (1957-58 to 1961-62)	11,926	3,793
Fourth quinquennium (1962-63 to 1966-67)	13,127	4,180
1966-67	14,188	4,121

(3) Other Foodgrains :

During the year 1947-48 the total acreage under other foodgrains namely, maize, sorghum, millets and barley which are grown mainly in West Pakistan, was 4.48 million acres and the production 0.99 million tons. The area as well as production of these crops was reported to be 5.3 million acres and 1.3 million tons respectively in the year 1965-66, showing an increase of 18.8 per cent and 31.3 per cent respectively over the year 1947-48. The increase in acreage

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as well as production has been mainly confined to maize. These crops, however, are considered as coarse foodgrains and any increase in their acreage and production has been mainly due to the shortage of principal foodgrains in the country.

(B) CASH CROPS

(1) Cotton :

Cotton is one of the important foreign exchange earnings crops of Pakistan ranking next to jute. About 98 per cent of the area under this crop is in West Pakistan of which 87 per cent is under Pak Upland type and 11 per cent under Desi (indigenous variety). The remaining 2 per cent of the area is in East Pakistan where Comilla Desi variety is raised. While in East Pakistan cotton is grown in rain-fed areas, in West Pakistan 98 per cent of the area is irrigated. With increased demand from the growing textile industries in the country as well as for export both the area and production of cotton have increased over years. While in 1947-48 the area was 3.1 million acres and production 1.06 million bales, by 1966-67 the acreage rose to 3.98 million acres (i.e. 28.1 per cent increase) and production to 2.57 million bales (i.e. increase of 47.8 per cent). The following table will show the area and production (quinquenniumwise) during 1947-48 to 1966-67.

Average of	In thousand acres	In thousand bales
First quinquennium (1947-48 to 1951-52)	3,002	1,236
Second quinquennium (1952-53 to 1956-57)	3,347	1,652
Third quinquennium (1957-58 to 1961-62)	3,413	1,707
Fourth quinquennium (1962-63 to 1966-67)	3,716	2,300
1966-67	3,375	2,573

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(2) Jute:

Jute is the principal foreign exchange earner of Pakistan. For this very reason it is termed as "Golden Fibre". Its cultivation is confined to East Pakistan only. The area under this crop was 2.06 million acres in 1947-48 which rose to 2.16 million acres in 1966-67. The production, however, went down from 6.84 million bales to 6.40 million bales during the same period. The competing crops of jute are autumn rice and sugarcane. With increase in the acreage under rice and sugarcane due to 'Grow More Food Campaign' as well as to their higher market prices the area and production of jute has continued to fluctuate from year to year as will be evident from the table below :-

Average of :	In thousand acres	In thousand bales.
First quinquennium (1947-48 to 1951-52)	1,797	5,598
Second quinquennium (1952-53 to 1956-57)	1,396	5,422
Third quinquennium (1957-58 to 1961-62)	1,609	5,836
Fourth quinquennium (1962-63 to 1966-67)	1,867	5,818
1966-67	2,165	6,400

(3) Sugarcane.

At the time of Independence Pakistan was a net importer of sugar. Vigorous efforts were, therefore, made to increase the production of sugar by establishing more sugar factories and the cultivation of sugarcane has thus gone up rapidly. The area under sugarcane was 0.69 million acres in 1947-48 which rose to 2.02 million acres in 1966-67, showing a spectacular increase of 192.7 per cent. The production of cane has also registered a sharp rise during this period. While its production was 8.71 million tons in 1947-48, it increased to 29.71 million tons during 1966-67, thereby

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indicating a phenomenal rise of 241 per cent. The following table will show the quinquenniumwise area and production of sugarcane during 1947-48 to 1966-67:

Average of	In thousand acres	In thousand tons.
First quinquennium (1947-48 to 1951-52)	713	9,522
Second quinquennium (1952-53 to 1956-57)	916	12,197
Third quinquennium (1957-58 to 1961-62)	1,324	15,814
Fourth quinquennium (1962-63 to 1966-67)	1,733	25,592
1966-67	2,018	27,705

With the increased availability of sugarcane the production of sugar also rose from 35,219 tons in 1948-49 to 465,366 tons in 1965-66. And Pakistan has by now become self-sufficient in sugar production and has even developed some export potentials.

(4) Tea :-

Tea, an important commercial crop, is grown in East Pakistan only. The acreage and production of tea show a rising trend since 1947-48 when its acreage was 70,000 acres and production 28.10 million pounds which rose to 95,000 acres and 64.50 million pounds respectively during 1966-67. The acreage has, therefore, increased by 35.7 per cent and production by 123 per cent during this period. The increase in the acreage and production has been more rapid from the year 1959-60 onwards which is due to the renovation of depleted gardens and Government's compulsory programme of 3 per cent annual increase in the area. One of the factors for increase in production has been the increased yield per acre which was 4.9 maunds in 1947-48 and rose to 8.3 maunds during 1966-67. The quinquenniumwise area and production of tea during 1947-48 to 1966-67 are given **over-leaf .**

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Average of	In thousand acres	In million pounds.
First quinquennium (1947-48 to 1951-52)	73	37
Second Quinquennium (1952-53 to 1956-57)	**75**	**53**
Third Quinquennium (1957-58 to 1961-62)	77	51
Fourth Quinquennium (1962-63 to 1966-67)	88	59
1966-67	95	64.5

(5) Tobacco: Tobacco is another important cash crop and grown in both the Wings. As a result of increasing demand from the cigarette industries with consequent rise in prices the acreage and production of tobacco has gone up rapidly since Independence. Its acreage increased from 161,000 acres in 1947-48 to 253,000 acres in 1965-66 i.e. rise by 57.1 per cent. The production rose from 132 million pounds to 302 million pounds during the same period, showing a phenomenal increase of 129 per cent. This increase has been registered mostly in West Pakistan. The area & production of tobacco during 1947-48 to 1966-67 are given below:-

Average of:	In thousand acres	In million pounds
First Quinquennium (1947-48 to 1951-52)	171	152
Second Quinquennium (1952-53 to 1956-57)	195	186
Third Quinquennium (1957-58 to 1961-62)	203	207
Fourth Quinquennium (1962-63 to 1966-67)	231	248
1966-67	251	N.A.

C. OIL SEEDS

The area under various oil seeds was estimated to be 17.19 lakh acres during the year 1947-48 and production 3.25 lakh tons which rose to 19.03 lakh acres and 3.64 lakh tons respectively during 1965-66. The area thus rose by 10.7 per cent and the production by 12.0

per cent. However, the area and production of rape seed and mustard, sesamum and linseed did not show much improvement and indicated only a slight increase over the year 1947-48 in spite of greater demand for the same. It was mainly due to the fact that these crops are very susceptible to pests and diseases and economic returns from these crops are also comparatively lower. The production of ground-nuts and castor seeds has , however, showed a remarkable increase. The reason for this increase may be assigned to the fact that these oil seeds have some commercial uses and with the establishment of various industries the demand for them is continually on the rise.

D.OTHERS

(i) **Pulses.** The area and production of pulses have not shown much improvement. The total area under pulses was 17.15 lakh acres during the year 1947-48 which rose to 18.73 lakh acres during the year 1965-66. The production of pulses which was 4.38 lakh tons came down to 3.95 lakh tons during the same period. While the area under the cropshas somewhat increased the production has slightly gone down. The increase in area works out to be 9.2 percent while the decrease in production comes to 9.8 per cent. The reason for the downward and erratic trend in area and production of pulses may be assigned to diversion of area to more remunerative crops and cultivation of pulses on comparatively poorer lands which,coupled with seasonal variations, affected production of pulses.

(2) Vegetables:

(a) Potato: Cultivation of potato has gained importance during the past one decade. Prior to 1955-56 area and production figures for the crop were not maintained separately in East Pakistan. Figures of West Pakistan show that the area under the crop during 1947-48 was only 7,000 acres which increased 6 times by the year 1965-66 when it was 42,000 acres and production during the same period rose from 0.76 million maunds to 4.11

million maunds. In East Pakistan the area went up from 64,000 acres in 1955-56 to 150,000 acres in 1965-66 and production from 3.38 million mds. to 17.5 million maunds during the same period.

(b) Other vegetables: The total area under other vegetables shows somewhat downward trend. The total area in 1947-48 was reported at 719,000 acres which went down to 567,000 acres during the year 1965-66. So is the case with the production which was reported to be 41.1 million maunds during the year 1947-48 against 40.7 million maunds during 1965-66. The decline in acreage and production may be attributed to the fact that the area under vegetables was diverted to more paying crops.

C. FRUITS:

No statistics in respect of area was maintained upto the year 1957-58. However, the available data from the year 1957-58 onwards shows a tremendous rise in both the acreage and production of fruits. The total area under fruits during 1957-58 was 180,000 acres which increased to 693,000 acres during 1965-66, showing an increase of 285 per cent. The production of fruits has also continued to increase simultaneously in both the Wings mainly due to coming into bearing of newly planted fruit plants. The total production of fruits went up from 23.1 million mnds. in 1957-58 to 78.2 million mds. in 1965-66, indicating an increase of 238.5 per cent.

VI. ANIMAL HUSBANDRY PRODUCTION:

Livestock plays an important part in the development of a balanced agriculture and it accounts for about 21 per cent of the entire value added to agriculture. Improvement of this sub-sector was accorded due emphasis to improve the dietary level of the people as well as to ensure increased draft power. Due to various development measures the value of livestock products increased from Rs.2,975 million in 1947-48

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to Rs.4,248 million in 1966-67, registering a rise of 43 per cent.

VII. FISHERIES PRODUCTION:

Fisheries products constitute about 7 per cent of the total value added to agriculture. Pakistan has a large fisheries resources, both inland and marine. Development of fisheries has been taken up both by the Central and Provincial Governments. As a cumulative effect of various development efforts, the value of fisheries products rose from Rs.866 million in 1947 to Rs.1,382 million in 1966-67 i.e. an increase of about 60 per cent. The production of fish went up from 2.43 lakh metric tons in 1952 to 4.12 lakh metric tons in 1966, showing a rise of 69.5 per cent. Foreign exchange earnings from the export of fish and fish products increased from Rs.12.3 million to Rs.82.0 million during the same period indicating an increase by about 567 per cent.

VIII. FORESTRY PRODUCTION:

Pakistan at present has 10.3 million acres of land under forests which constitute about 4.5 per cent of the total landed area. Forest products also contribute about 0.7 per cent of the gross value added to agriculture. Various measures have been undertaken by the Government to develop forest wealth of the country. As a result, the total area under forest increased from 6.4 million acres in 1947-48 to 10.3 million acres in 1965-66, showing a rise of 60 per cent. The value of forest products rose from Rs.71 million to Rs.150 million during the same period, indicating a more than 100 per cent increase.

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IX. TOTAL VALUE OF AGRICULTURAL PRODUCES:

Total value of agricultural produces including livestock, fisheries and forest products rose phenomenally from Rs.14,669 million in 1949-50 to Rs.22,629 million in 1966-67, showing an increase of 54.3 per cent. The Gross National Product, on the other hand, increased by 84.7 per cent during the same period, indicating thereby a comparatively higher growth rate in other sectors of the economy, especially in manufacturing. Accordingly, the contribution of agriculture to GNP fell from 60 per cent during 1949-50 to 45.7 per cent during 1966-67. This decrease has been quite steady althrough out the post-independence years, which is a healthy sign of economic growth as economy is being gradually diversified and thereby strengthened.

X. FACTORS CONTRIBUTING TOWARDS INCREASED AGRICULTURAL PRODUCTION.

Increased agricultural production has been achieved in Pakistan mainly as a cumulative effect of judicious policies vigorously pursued by the Government to ensure a greater supply of various production requirements to the farmer and to provide him increasing expectations of higher economic returns for rapidly raising his output.

Agriculture in Pakistan was a victim of the centuries of neglect. Even in the early period of Independence not much head-way could be achieved in increasing its productivity. Apart from the bottlenecks in the administrative set up inherited from the foreign rulers which was not properly attuned to the developing needs of this newly emergent nation, various existing socio-economic and political set up were not much conducive towards achieving the desired pace of development. It was only during the post-revolution era

under the dynamic leadership of President Ayub, which also coincided with the Second Plan period, that new frontiers were explored to evolve such an agrarian and administrative set up which could bring about accelerated momentum in agricultural development.

In the following paragraphs a review has been made of the various important factors effecting increased national agricultural production. These factors have been discussed under the following three broad-categories:

(1) New Farming Technology,

(2) Economic Factors, and

(3) Government Policies and Administrative Measures.

It may, however, be added that such broad categorization is beset with some practical difficulties as the various factors are closely inter-linked with one another.

A. Influence of new farming technology:

Technological innovation in agriculture through the application of fertilizers, introduction of high yielding and disease-resistant crop varieties, plant protection measures, improved farm machinery and appliances etc. has greatly contributed towards increased agricultural production.

(1) Fertilizers:

The use of fertilizer was quite insignificant in the early fifties. As a result of vigorous extension drives to popularise its use, coupled with liberal import and increasing internal production, the consumption of fertilizer has been rising rapidly. The Government has been heavily subsidising the sale of fertilizers to the extent

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of 35 to 50% of its sales value which has provided great incentives to the farmers to use fertiliser. The amount spent by the Central Government on subsidy to fertilizer went up from Rs.7.7 million in 1955-56 to Rs.78.3 million in 1966-67. As a result of various promotional measures the consumption of fertilizers in terms of nutrients increased from 1.31 lbs. per acre in 1959-60 to 5.27 lbs. in 1965-66.

(2) IMPROVED SEEDS:

A number of high-yielding and disease-resistant crop varieties have been evolved by your agricultural scientists during the last 20 years. The production of improved seeds has been greatly increased through the establishment of a large number of seed farms and through registered growers. Supply of seeds has been greately accelerated through ADCs. Seeds of high yielding IRRI rice (giving yield between 75-100 maunds per acre) and Mexican Wheat (with yield upto 60 maunds per acre) have been imported and vigorous extension drive undertaken to popularise these varieties.

(3) PLANT PROTECTION:

There was practically no plant protection service at the time of Independence. The Provincial Governments were only doing some propaganda and demonstration work. It was only from 1953 that the large scale pest control was organized by the Central and Provincial Governments by pooling their resources. Increasing emphasis has since been given to expand these services. As a result, the area covered by plant protection services rose from 2.00 million acres in 1954-55 to 6.5 million acres in 1965-66

(4) MECHANISED APPLIANCES:

Mechanised farming is being increasingly encouraged by the Government to bring to the progressive farmers the benefits of modern technology. East Pakistan having ...

predominance of small holdings, hand-operated tillers are being encouraged there. In West Pakistan, the size of holding is somewhat big and the virgin land to be brought under cultivation large. Accordingly, the pace of introducing mechanised appliances in that Wing has been somewhat greater. Agricultural Development Bank, aided by an IDA-credit worth 27 million dollars has contributed greatly towards rapid mechanisa-tion of agriclture in the country.

(5) IRRIGATION, FLOOD CONTROL & DRAINAGE

(a) Irrigation:

Desirable increase in agricultural production could not be achieved unless controlled supply of irrigation water is assured to the farmers. A number of dams like G.D. Barrage, Guddu Barrage, Taunsa Barrage, Kotri Barrage and Tarbak Dam etc. have been constructed during post-independence period. Besides, a number of dams are on the various stages of construction. The Indus Basin Project, which comprises construction of two dams, namely, Mangla on the river Jhelum and Tarbela on the river Indus, has also greately facilitated assured supply of irrigation water. The construction of Mangla Dam has already been completed and the work on Tarbela Dam is progressing satisfactorily.

Similarly, in East Pakistan a number of irrigation projects have been taken in hand, of which G.K. Project, Teesta Barrage, Monu River Project, Dacca-Narayanganj-Demra Irrigation Project etc. may be mentioned; some of them have already been completed. Furthermore, the Ground Water Development and Pump Irrigation Project completed in 1965-66, will irrigate about 1.86 lakh acres in the northern districts of East Pakistan. East Pakistan Agriculture Development Corporation has also a large fleet of power pumps numbering

about 4,000 units to irrigate mostly the area under rice.

As a result of vigorous implementation of irrigation development programmes, the irrigated areas have increased phenomenally from 21.55 million acres in 1947-48 to 28.69 million in 1964-65.

b. Reclamation and Drainage:

In West Pakistan, due to extensive net-works of irrigation canals without corresponding development of facilities for dranage gave rise to menacing problems like water-logging and salinity. About 0.7 to 1.0 lakh acres of rice irrigated lands are thus going out of cultivation annually. Vigorous efforts have, therefore, been launched by the Government to recover these lands through large-scale installation of tube-wells and construction of drainage canals, both open and under-ground. For reclamation of these affected area, Salinity Control and Reclamation Project (SCARP) was initiated in 1959. It has been spread over a number of project areas under which thousands of tubewells were installed. As a result, the water level in the affected areas is going down rapidly and more areas are once again being made fit for cultivation. Furthermore, tubewells have also ensured increased supply of water for irrigation purposes and accordingly, the crop productivity in the project areas is going up phenomenally.

XI. ECONOMIC FACTORS.

(A) Credit

The farmers are increasingly being advanced agricultural credit for purchase of their various production requirements. This has been all the more essential in view of the meagre savings available with our farmers for re-investment. The institutional sources of credit were hardly in existence at the time of Independence. Taccavi loan (State Credit) was no doubt being supplied but that too was quite inadequate and mostly to meet the emergency needs of the farmers. Cooperatives were not also properly developed. It was only during the Second Five Year Plan period that a real break-through was attained in the field of agricultural credit. Agricultural Development Bank of Pakistan was established during 1960-61 by merging the former* ADFC (established in 1952) and@ ADP (formed in 1957). The loan operation of the Bank was streamlined and simplified so as to facilitate speedy loans to the farmers. Credit has been linked with marketing. The Bank also ensures that loans advanced by it are productively used. The Bank with its 114 offices advanced about Rs 678.6 million upto March, 1967. The amounts advanced by it rose from Rs 70.5 million during the First Plan to Rs 396.8 million during the Second Plan, showing an increase of about 463 per cent. Furthermore, an International Development Association (IDA) credit worth 27 million dollars was arranged for the Bank to finance the foreign exchange component of loans for importing agricultural machinery.

Like-wise, increased quantum of state credit (Taccavi) was advanced to the farmers to rehabilitate them at the time of distress as well as to cater to their production requirements. During 1949-50 an amount of Rs 8.7 million was supplied as Taccavi loans which increased to Rs 59.6 million during 1964-65.

* Agricultural Development Finance Corporation

@ Agricultural Bank of Pakistan

The development of cooperatives has also contributed much towards raising crop productivity. Cooperative movement has been strengthened and revitalized so as to enable the Cooperative Societies meet the growing requirements of the farmers for production credit. The State Bank of Pakistan has been supplying credit in a gigantic scale to Agricultural Development Bank and Cooperatives for subsequent loaning to the farmers. The total amount sanctioned to these two institutions was Rs 416.3 million during 1965-66 (ADBP Rs 222.0 million and Cooperatives Rs 194.3 million). Apart from supplying agricultural credit, the Cooperative Societies have afforded opportunities to the farmers for adopting improved farming practices and for better marketing of their crop produces.

(B) Economic returns from crop produces

The Government is particularly conscious that the farmers must be assured fair returns from their produces so as to induce them bring about desirable increase in crop productivity. Accordingly, statutory minimum prices for major exportable commodities like Jute have been fixed. The purchase prices of sugarcane, another important cash crop, has been fixed by the Government to such a level that the farmers get economic returns for this commodity. Procurement prices of the major food items like rice and wheat have also been raised by the government to ensure better returns to the farmers. The higher procurement prices of wheat and rice, which have recently been fixed, will be operative for a period of three years which would ensure expectation of farmers for better returns over a longer period.

(C) Better marketing and storage facilities

The Department of Marketing Intelligence and Agricultural Statistics in the Centre and Agricultural

Marketing Directorates in the Provinces are running schemes to disseminate training in handling products of different commodities and in introducing grading of wool, hair, hides, skins, etc. which are mainly exported. Storage facilities for agricultural products, especially food crops, have greatly been expanded, particularly in the public sector. A large number of cold storage plants have been established in the private sector. This has ensured even supply of the commodities stored and assured higher returns to the growers. Liberal credit facilities have been arranged for establishing more cold storage plants. Similarly, marketing structures are also being reorganized to offer better marketing facilities to the growers. A number of regulated markets have so far been established to facilitate organized marketing of the farm produces.

(D) State subsidy

It has been duly recognized by the Government that in order to encourage improved methods of farming various production requirements of the farmers should be made available to them at subsidized prices at the initial stages. Accordingly, the main production inputs like fertilizer, seed, etc. are made available to the farmers at subsidized costs. Plant protection services are rendered free of cost.

(E) Fiscal policies of the Government have been so adopted as to help farmers get economic returns from their produces. Export duties on major crops have been drastically reduced so that these benefits could accrue to the growers. Accordingly, the export duty on cotton which was ranging between Rs 40 to Rs 300 per bale during 1948-49 to 1950-51 was reduced to Rs 10 per bale from 1964 onward. Similarly, export tariff on jute, which varied from Rs 15 to Rs 35 during the years 1947-48 to 1951-52, was lowered to Rs 10 from 1964 to-date. Export of tea, hides, skins and wools has altogether been exempted from the payment of export duty.

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XII. GOVERNMENT POLICY AND ADMINISTRATIVE SETUP

As stated earlier, agriculture did not receive the priority it deserved in economic development programmes of Pakistan during the early years of Independence. The First Five Year Plan, however, made the first concerted move to identify the correct strategy for agricultural development and planned efforts were initiated; but due to organizational drawbacks and lack of proper policy directions not much progress could be achieved during that period. It was only during the Second Five Year Plan and onwards that development of agriculture took place at an accelerated pace. Increasing allocation was made for agricultural development. Allocation for agriculture in the public sector was raised from Rs 1,510 million during the First Plan to Rs 2,520 million during the Second Plan period. This allocation has been further increased to Rs 4,115 million during the Third Plan. Furthermore, increased allocation was made for water development to ensure greater supply of irrigation water. Simultaneously, the entire organizational set-up was made dynamic to implement the programmes pertaining to agricultural development. Two Agricultural Development Corporations were set up in 1961, one in each wing, with the revolutionary idea of expediting agricultural development through such decentralized semi-government organization and to promote commercial aspects of agriculture. These Corporations have been entrusted with the supply of various production requirements of the farmers. They have also undertaken intensive development works in the project areas. In West Pakistan the Small Dam Organization has been brought under the administrative control of A.D.C. and it has been constructing a number of small dams in the hilly regions for supply of irrigation water. Likewise, water and Power Development Authority, one in each wing, was established

in the year 1958-59 as a semi-autonomous body to undertake water and power development programme. Both these institutions have met with phenomenal success in this respective fields.

... Removal of control

The Government has recognized the importance of and necessity for developing a free market mechanism with the right to interfere as and when necessity will arise. Various restrictive measures which tend to affect agricultural production are being removed gradually. This has helped create a suitable climate enabling the farmers to take suitable agro-economic decisions without facing the restriction of controls. Accordingly, the licensing of jute acreage which was considered to be of doubtful utility and was in operation since 1940 was abolished in 1960. Procurement policy has been so revised that the Government could retract from commercial operations. This was essential to give incentive to private enterprise and to free the Government for undertaking more fruitful operation. With that end in view, compulsory procurement of wheat and rice was abolished and attractive floor prices for these commodities were fixed. Similarly, distribution of fertilizers, which was one of the main functions of the Agriculture Departments, is being gradually transferred to the private sector.

B. Government policy on agricultural research, extension and education

The Government has fully recognized the importance of agricultural research, extension and education in the development of agriculture. Accordingly, various measures have been adopted from time to time to strengthen, revitalise and expand facilities for these vital services. Research facilities have been greatly expanded, both qualitatively and quantitatively, in conformity with the growing requirements for research. Extension services have also been greatly

reorganized to make them discharge their functions more efficiently and speedily. These services were previously over-burdened with supply functions. With the transfer of these functions to A.D.Cs. the extension staff are exclusively entrusted with advisory services to the farmers. Increasing number of demonstration blocks have been set up to help the farmers in adopting improved agricultural practices. Farm broadcast Programmes have been initiated from the leading radio stations for inducing the farmers to undertake improved methods of farming.

With a view to improving the standard of agricultural education in the country, two Agricultural Universities, one in each wing, were set up in 1961. These universities, apart from producing qualified graduates to meet the growing requirements of technical personnel, have also added increased momentum to agricultural research and extension. Agricultural-oriented subjects have been included in the curriculam of secondary and lower secondary schools to instil agricultural bias among the students.

(C) Land tenure policy.

It has been duly recognised by the Government that the farmers must get adequate incentives towards improving their agricultural output and the land tenure system must conform to that objective. There should be adequate security of expectations so that the farmers could undertake medium and long term investments in developing their resources. With those ends in view various land reform measures have been introduced in Pakistan since the attainment of Independence. In East Pakistan, the land tenure system was a legacy of the foreign domination where under the dead weight of Permanent Settlement Act, enforced in 1793, all incentive of the farmers towards agricultural development were smothered. This system gave rise to a plethora of intermediary rent-receiving interests which in some

cases spread upto 50 or more between the original zamindar and the actual cultivator and the latter had to bear the entire burden of supporting these intermediaries and therefore, had to pay exorbitant rents. This system also gave rise to various socio-economic evils. In order to mitigate these evils and to make the land tenure attuned to the requirements of a developing agriculture, East Bengal State Acquisition and Tenancy Act was passed in 1950, according to which all the rent-receiving interests were abolished on payment of compensation and the farmers were brought directly under the State. The land thus belongs to the Government but the farmers have been assured full occupancy right. The future emergence of intermediaries has been prevented by forbidding subletting. A ceiling of about 37 acres was fixed on individual holding. Lands in excess of this limit were resumed by the Government on payment of compensation and distributed among the farmers having uneconomic holding and among landless cultivators. It was, however, subsequently realised that this limit on holding was not conducive to giving adequate incentives to farmers, especially in undertaking mechanized cultivation. Accordingly, the ceiling was later raised to 125 acres. Further-more, the system of land assessment was rationalized and provision was made for consolidation of holdings.

Similarly, in West Pakistan various tenancy improvement reforms were introduced from time to time since Independence to improve the relationship between the landlords and the tenants and to give the latter more security, but most of them remained ineffectual. It was only when the Revolutionary Government of President Ayub came to office that the most radical land reform was introduced in 1959. Under this reform, ceiling on individual holding was fixed at 500 acres for irrigated areas and 1,000 acres for un-irrigated areas

(or an area equivalent to 36 thousand produce index unit) and the lands in excess of such ceilings were resumed by the Government on payment of compensation and distributed among the tenants. All Jagirs were abolished without any payment of compensation except those holding Makhadim Rights. (These Jagirs were generally given by the British Government as gifts to their local supporters for the services rendered by them). Occupancy tenants were given ownership right and the tenants full security to operate their lands. Proper regulatory measures were enforced to effectively implement this land reform. Consolidation of holdings progressed at a very rapid pace as per ordinance of 1960 which made it obligatory for the farmers to consolidate their holding. Accordingly, the total area consolidated during the Second Plan period was 7.8 million acres and during the Third Plan period an estimated area of 1 million acres will be consolidated annually.

D. Rural Works Programme:

The Institution of Basic Democracies has been highly instrumental in bringing rapid transformation of the rural areas through the Works Programme. The rural masses have been closely associated with the planning and developing their agricultural resources. Under the Rural Works Programme heavy amounts are being spent annually to develop rural infra-structure through the construction and repairs of roads, irrigation canals, drainage, embankments, etc. This has, therefore, ensured increased supply of irrigation water as well as development of better communication and consequent greater marketing facilities to the farmers. Furthermore, this has offered great employment opportunities to the rural labour during off season. A sum of Rs 650 million was spent on this programme during the Second Plan period and an allocation of Rs 2,500 million has been made for this

programme during the Third Plan period.

E. Coordination among various organization.

Proper coordination has been effected among all the organizations engaged in agricultural development. Two High Powered Agriculture Policy Committees have been set up, one in each Wing, under the Chairmanship of the Provincial Governors and including high officials from the various departments to give policy guidance, coordinate and intensify development efforts in agriculture. Top priority has been given to attain self-sufficiency in food production by the end of the Third Plan period i.e. 1970 and the whole government machinery has been set in high gear to attain this objective.

Mohasil'

PAPER ON FOODGRAIN PRODUCTION POTENTIAL 1967-75 PREPARED FOR THE CENTO CONFERENCE ON NATIONAL AND REGIONAL AGRICULTURAL DEVELOPMENT POLICY - ISTANBUL Sept. 10-16, 1967.

BY

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Agriculture is now accepted by the farming community of Pakistan as a commercial proposition which was not the case some years ago. The present Government under the dynamic and determined leadership of President Mohammad Ayub Khan has recognized that the interest of the rural areas where bulk of the population is dependent directly or indirectly on agriculture must be looked after, if nation is to prosper. It is on this basic concept that the country's policy towards rural development including the development of agriculture has been directed.

After Independence the development of agriculture remained for many years in a neglected condition due to political instability and absence of sustained efforts to attend to the complex problems of agriculture which required urgent solution. The obvious result was that the agricultural growth rate remained lower than the population growth rate. The present Government is determined to rapidly increase agricultural production not only to achieve self-sufficiency in food by 1970 but also to meet the increasing requirements of other sectors of the economy which depend on agriculture. In this context, the subject of "Foodgrain Production Potential" is vital for Pakistan.

The system of cropping is influenced by the phenological conditions and varies in the two provinces. In East Pakistan rice is the principal foodgrain of which three crops are raised during the year. Other main crops grown are Jute, sugarcane, oil seeds and tobacco. In West Pakistan wheat being the staple diet of the people is grown as the principal foodgrain followed by rice, maize and

millets. Other main crops grown in the province include cotton, sugarcane, oil seeds, pulses and tobacco. The cultivation of these crops is being practiced for centuries and in recent years great improvements have been made in the evolution of new varieties, the introduction of which is having a great impact on production. The actual results of this development will be discussed subsequently but it is well worth to mention here that these developments have changed the entire concept of production potential particularly in the case of foodgrain crops in which case great progress has been made in the evolution and introduction of high yielding varieties. There is now a clear thinking that with these improvements soon Pakistan will be included in the category of those countries which export foodgrains.

Agricultural Development before and during the Second Plan period.

Agricultural growth in Pakistan prior to 1960 remained almost stagnant and could not keep pace with the requirements of the growing population. This failure in the key sector of agriculture was a disappointing feature. Nevertheless, organizational and institutional improvements were effected in the past 1960 period which proved useful. Concerted emphasis was also placed on agricultural inputs.

The production increase in the case of foodgrain crops was particularly significant as will be seen from the following data:-

Production of foodgrain crops.

-Thousand tons-

Commodity	1959-60	1964-65	Percentage increase or decrease.
			Per cent.
1. Rice	9461	11666	+ 23.3
2. Wheat	3876	4552	+ 17.5
3. Bajra	324	439	+ 35.5
4. Jowar	229	288	+ 25.8
5. Maize	480	523	+ 9.0
6. Barley	149	128	- 14.0

It will be noted from the above table that a wide spread improvement took place in production of virtually all foodgrain crops. The total production increased by about 3 million tons in 1964-65 as compared to 1959-60. Although no systematic study to determine the effect of application of each input on production has so far been made, it can be stated with fair amount of accuracy that increased use of various inputs particularly fertilizers, plant protection, improved seed and ground water development played a significant role.

The actual position regarding the use of these inputs is also briefly explained below:-

FERTILIZER:- At the time of Independence the use of chemical fertilizer was almost unknown. Subsequently the Government implemented such policies towards agricultural development that the use of fertilizer was highly emphasised upon. Fertilizer was subsidized by the Government and strong extension programmes were initiated to popularise its use with the result that its consumption started increasing as will be seen from the following table:-

Quantity distributed(in terms of plant nutrients i.e. N+P+K)
(1959-60 to 1964-65)

Year	East Pakistan	West Pakistan	Total.
	-thousand tons-		
1959/60	11.2	19 4	30.6
1960/61	22.5	31.4	53.9
1961/62	22.5	37.5	60.0
1962/63	27.0	40.0	67.0
1963/64	49.0	68.7	117.7
1964/65	45.0	87.2	132.2

The consumption of fertilizer increased from 30.6 thousand tons (in terms of nutrients) in 1959-60 to 132.2 thousand tons in 1964-65 showing the increase of about 332 per cent. In fact much

higher use of fertilizer was expected to take place during the Second Plan period but on account of certain difficulties regarding the procurement of fertilizer, availability of foreign exchange, changes in the rate of subsidy and partly due to unsatisfactory distribution arrangements, the rate of consumption remained rather slow. It must be emphasised here that as a result of efforts which the Government has made to popularise the use of fertilizer it has been accepted by the farmers as an important input required for increasing productivity particularly when new varieties highly responsive to the use of fertilizer have been introduced.

PLANT PROTECTION:- During the First Plan period an amount of Rs. 6 crore was provided for this subsector which was too small to effectively perform plant protection work. During the Second Plan the amount was increased to Rs.33.14 crore . As regards the actual performance the curative measures covered an area of about 6.5 million acres in 1964-65 against the Plan target of 6.0 million acres thus exceeding the target by 8 per cent. As regards preventive measures an area of 2.4 million acres was sown with the treated seed in 1964-65 against the Plan target of 14 million acres thereby showing a shortfall in achievement in this sphere.

IMPROVED SEED:- The distribution of improved seed of the principal crops during 1959-60 to 1964-65 was as follows:-

Year	East Pakistan	West Pakistan	Total
	-Thousand tons-		
1959/60	6	27	33
1960/61	7	84	91
1961/62	8	54	62
1962/63	10	7	17
1963/64	7	28	35
1964/65	9	31	40

Comparing with 1959-60 the distribution of improved seed from the Government sources increased by 176 per cent in

1960-61 and by 88 per cent in 1961-62. However, there was a short-fall of 48 per cent in 1962-63 which was generally caused on account of institutional changes made in the organizations dealing with the distribution of improved seed. These problems have been taken care of and it is expected that this sub-sector will play significant role in the Third and subsequent plan. In fact the use of improved seed greatly increased during the last year of the Second Plan as most of the seed of improved varieties was transferred from one farmer to another.

WATER:- For the development of water and power a sum of Rs.270 crore was allocated during the First Plan. As against this the allocation in this sub-sector was raised to Rs.414 crore in the public sector and to Rs.25 crore in the private sector during the Second Plan period. This development is expected to have great impact on agricultural production during the Third Plan period. In West Pakistan one of the most significant phenomena in agricultural development during the Second Plan period has been the installation of private tubewells at exceedingly fast rate which in 1959-60 the total number of tubewells was only 4214 in West Pakistan, by July 1965 the number of private tube-wells increased to about 31,500 . It can be said with accuracy that this development has helped great in increasing production.

There are indirect factors also like the Extension Service, agricultural research and education, availability of credit which have given support to increasing production. According to a rough analysis it is estimated that in West Pakistan the value of crop out-put grew at about 26 per cent during 1960-65.

Strategy for the Third Plan(1965-70) and Foodgrain Production targets

The basic concept embodied in the Third Plan is to take advantage of the momentum set out in agricultural development during the Second Plan. Under this concept the following ultimate

goals have been set out:-

(a) To increase the real income of farmers at least at the same rate as per capita increase in the non-agriculture sector.

(b) To move towards self-sufficiency in food requirements to the extent compatible with the other needs of the conomy, including foreign trade, aiming at the same time, at improved nutritional standards in food consumption; and

(c) To promote agricultural development on a sound, self-propelling basis by further improvements in agricultural organizations, and by intensified programmes such as for the developments of marketing, cooperatives, storage, credit, educational and other institutional and infrastructural facilities.

Based on this concept the following foodgrain production targets were fixed:-

BENCHMARKS AND TARGET OF FOODGRAIN PRODUCTION FOR THIRD PLAN (1965-70)

Crop	Third Plan Benchmarks. East Pakistan	West Pakistan	Total.	Third Plan targets. East Pakistan	West Pakistan	Total	Increase, targets over benchmarks. All Pakistan. %
	- in thousand tons -						
Rice	10,200	1,200	11,400	12,725	1,720	14,445	27
Wheat	37	4,120	4,157	64	5,400	5,464	31
Maize	5	500	505	16	770	786	56
Other Foodgrains.	18	720	738	20	750	770	4
Total:-	10,260	6,540	16,800	12,825	8,640	21,465	28

These targets envisaged 28 per cent increase in the production of foodgrains giving a growth rate of 5.6 per cent per annum. It has roughly been estimated that 35 per cent increase in production will come out as a result of increased availability of water and on account of improved area, 35 per cent from fertilizer consumption, which is expected to increase from 162 thousand tons (in terms of nutrients) in 1964-65 to 484 thousand tons in 1969-70.

The rest of the increase was expected to be contributed by other factors such as plant protection, use of improved seed, cultural practices, etc.

Estimated Requirements of foodgrains upto 1970.

Although foodgrains have fairly constant demand, yet it is difficult to estimate accurately the future requirements on account of non-availability of adequate data to determine the consumption pattern. In Pakistan the consumption of foodgrains has been about 14.5 oz. per head per day during 1960-65; it was 15.9 oz. in East Pakistan and 12.8 oz. in West Pakistan. This consumption level would have continued if there had been no effect of price variations or the effect of income or expenditure elasticities. It is generally considered that the income elasticity of demand for foodgrains in Pakistan is about 0.5 per cent. The population is increasing which is adding to the demand for foodgrains. It is estimated that with an annual compound growth rate of 2.7 per cent the population of Pakistan by 1969-70 will reach to 127.4 million, 70.2 million for East Pakistan and 57.2 million for West Pakistan. Based on this growth rate and on the assumed expenditure elasticity of 0.3 per cent, 0.4 per cent and 0.5 per cent, the following gross demand for foodgrain has been projected:-

	Foodgrain production target 1969-70	Projected gross demand at different expenditure elasticities.		
		0.3 per cent	0.4 per cent	0.5 per cent.
	TONS	(Thousand tons)		
East Pakistan	12,825	13,107	13,270	13,434
West Pakistan	8,640	8,602	8,711	8,820
Total:-	21,465	21,709	21,981	22,254

It has been concluded that if the low elasticity of demand is accepted as correct, the country will be just self-sufficient in foodgrain with the Third Plan(1965-70) targets as already fixed.

But if the medium and high elasticities prove to be operating the country will be deficit to the extent of 0.5 to 0.8 million tons by 1970. Such a situation having developed might have continued but as a result of the development of new varieties, capable of profitably making use of fertilizer and other inputs it has become possible to further increase production leading to self-sufficiency within the Third Plan period. Consequently, the foodgrain production targets have been revised. Before dealing with the self-sufficiency Programme it seems desirable to discuss briefly the technological developments made in so far as the evolution of new varieties of foodgrains are concerned.

Technological Developments:- The future strategy for agricultural development has been largely based on the use of high yielding varieties. Based on this approach great importance was given to research and during the past few years good deal of progress has been made and it has been found that new varieties now evolved and introduced are capable of giving higher production by 50 to 100 per cent as compared to the old, traditional varieties. Achievements in the field of varietal improvement work in respect of principal foodgrain crops are summarised below:-

Wheat:- Wheat in West Pakistan is called the king of cereals. Researches to evolve high yielding varieties have been going on since long. 8A was the first improved variety evolved and given out for general cultivation followed by C-518, C-591 and C-217 which became the famous wheats. The varieties being tall with weak straw were not capable of accepting higher dozes of fertilizer. Recently, new varieties called C-566 and C-574 have been evolved which can give higher yield of 4 to 5 maunds as compared to the old improved varieties. Urgency of the situation required varieties capable of much better yield performance which problem has been solved by the introduction of Mexican dwarf wheats. These varieties have been under test for several years. Out of the different varieties tested, Penjamo and Mexi-Pak have given yield in farmers' fields of 40 to 59 maunds per acre. The yield at experimental

stations has been as high as 68 maunds per acre for Penjamo variety and 71.90 maund for Mexi-Pak variety. This development has made it possible to aim at doubling our wheat production from the existing acreage.

Rice:- Like wheat indigenous rice varieties are low yielding. These varieties being tall have poor fertilizer response. Rice varieties capable of giving as high a yield as 70 maunds per acre have been introduced. This refers to IRRI varieties of rice which were obtained from the International Rice Research Institute, Philippines, and tried both in East and West Pakistan. In East Pakistan, high rainfall received during the Aman season imposes certain limitations on the acreage which can be put under IRRI varieties. It is, however, estimated that out of the 23 million acres under rice it is possible to put about 7 million acres under IRRI varieties gradually. In West Pakistan the cultivation of IRRI rice was started in 1966 and during the current year more than 9000 acres have already been sown under this variety. There is a possibility of covering about 2 million acres under this high yielding variety out of the existing acreage in East Pakistan.

Maize:- The average yield of maize is about 11.8 maunds per acre and the annual acreage is about 1.4 million acres. Research work to evolve high yielding hybrid and synthetic varieties was started since long. This has given encouraging results. Hybrid Maize varieties namely Hybrid-59 and Hybrid-697 have been evolved which are capable of giving as high a yield as 100 maunds per acre. Since in the case of hybrids the seed is required to be replaced every year, researches were directed towards evolving synthetic varieties. Synthetic varieties called J-1, Synthetic No.2 and Synthetic No.200 have been evolved. The seed of these varieties does not need yearly replacement. It has been planned to bring in about 0.5 million acres under these varieties of maize by 1970.

Jowar and Bajra(Millets). A little more than 3 million acres are put under these foodgrains annually, almost entirely in West Pakistan.

The average yield presently being obtained is 5 maunds per acre which is very low. The work on the improvement of these crops has already been taken up and some high yielding strains have been selected. The yield of these foodgrains can also be improved substantially but their importance as foodgrain crops is limited in the country. There is a scope of introducing high yielding varieties in the country.

Self-Sufficiency Programme:- Our research programmes have held the assurance that self-sufficiency in foodgrains can be achieved by 1970. The revised strategy is based on the findings that new high yielding and fertilizer responsive varieties can become the main input particularly for the areas where irrigation facilities are already available. On account of the spectacular performance of the newly developed varieties a great demand of their seed has already been generated and it is possible that much larger acreage than actually envisaged is put under these varieties during the next three years. With this development the production targets have been revised. For West Pakistan the following targets have now been fixed:-

Foodgrain production targets
(1969-70)

	Original (Million tons)	Revised
(1) Wheat	5.40	7.00
(2) Rice	1.72	2.00
(3) Maize	0.77	1.00
(4) Other Foodgrains.	0.75	0.75
Total:	8.64	10.75

For achieving increased production the requirement of inputs has also been revised. In the case of fertilizer the consumption by 1969-70 will increase to 2.1 million tons from 1.3 million tons originally planned. Similarly action is being taken to immopve water resources to meet the additional requirements

of this programme. On the basis of production targets West Pakistan may become self-sufficient by 1969-70.

Similar strategy has also been planned for East Pakistan and a revised programme of increasing production of foodgrains has been prepared for the year 1967-68. The aim is to increase the production of rice alone by about 1.1 million tons and to continue this rate of increase until 1970. If this is achieved it will be possible for East Pakistan to raise the production of rice to 13.6 million tons by 1969-70. Their projected requirements being 13.43 million tons and this province will become self-sufficient by 1970.

Production Potential upto 1975:- Pakistan will enter the Fourth Plan period(1970-75) with a surplus production if the programmes as stipulated under the self-sufficiency scheme are successfully implemented. Such a situation would obviously enable the country to plan exports.

It is difficult to forecast production potentials upto 1975 with sufficient degree of accuracy. However, only purely tentative thinking can be given at this stage to explain the scope which exists to increase foodgrain production, without commitment. The cereal crops grown in the country and the technological developments towards their improvement have already been explained. It is in respect of these foodgrains mostly that the scope of increasing production would be discussed.

In West Pakistan wheat has the largest potential for higher production. The total irrigated acreage under this cereal is estimated at 8.0 million acres. It has already been planned to bring in 4 million acres under dwarf high yielding varieties upto 1970. It is, therefore, possible to put another 4 million acres under dwarf wheats upto 1975. This will cover the entire irrigated area under high yielding varieties. On the basis of an average yield of 40 maunds per acre which is easy to obtain, it may be possible to increase the total production of wheat to about 12 million tons from the irrigated area. There is a possibility

that at some places farmers may shift some land from wheat. Even if it happens, it should be possible to have about 1 million tons of production from the Barani areas thus making the total availability of wheat of 13 million tons in 1975.

The fertilizer requirement for the wheat programme will be in the neighbourhood of about 1.6 to 1.8 million tons.

Another cereal crop the production of which can be substantially increased is rice. The new high yielding dwarf IRRI rice varieties have proved successful and it has been possible to produce 2 tons of rice per acre in commercial production, if the land is properly fertilized and the attack of insect pest is fully controlled. Using the required inputs, it should be possible to have on the average 1 ton per acre of extra production of rice. The present area under rice is about 3.3 million acres out of which about 1.3 million acres are under fine varieties. It is, therefore, possible to cover 2 million acres under dwarf rice varieties and have an additional production of about 2 million tons, thus raising the total production of rice to 3.3 million tons by 1975. The approximate fertilizer requirement for this programme would be about 0.6 million tons.

Maize production can also be increased substantially. The present area planted with maize is about 1.4 million acres. The average yield is about 10 maunds per acre in contrast to the yield of about 70 - 80 maunds per acre obtained from hybrid and synthetic varieties. West Pakistan has planned to bring about 0.5 million acres under high yielding hybrid and synthetic varieties upto 1970. It is possible to bring another 0.5 million acres under these varieties upto 1975, thus making available a total production of little more than 2 million tons upto 1975.

The fertilizer requirements for this programme would be about 0.2 million tons.

The production of Jower and Bajra (millets) would also add to the total supply of foodgrain but as the production of the principal cereals will considerably increase, the importance of

Jowar and Bajra would automatically decrease and, therefore, they have not been accounted for at the present stage.

In East Pakistan rice is the staple foodgrain and is sown on an area of 23 million acres. The introduction of dwarf rice varieties has proved highly successful. There is an eligible acreage of 7 million acres which can be put under dwarf varieties. However, if it is possible to fully exploit this acreage by the introduction of high yielding varieties, it may be possible to increase the production to 17.4 million tons by 1975.

The above analysis gives a positive indication that it is possible to increase the production of different foodgrains grown in the country and raise their production to about 35.7 million tons by 1975 subject to the condition that the requirements of fertilizer, water, plant protection, etc. are fully met with.

It is expected that as a result of family planning, education and increase in the level of income, the growth rate of population would decrease. Also the level of per capita consumption of foodgrains will fall as people will shift to protective foods.

While it has not been possible to work out the actual requirements with sufficient degree of accuracy because of lack of data, it is assumed that the gross requirements of foodgrains by 1975 would be near about 25.52 million tons could be considered. It may be possible for Pakistan to meet the increased requirements for foodgrains from domestic sources if Nature remains benevolent.

PAPER ON CAPITAL AND CREDIT REQUIREMENTS OF AGRICULTURE, LOCAL AND FOREIGN EXCHANGE THROUGH THE CURRENT AND NEXT PLAN PRESENTED TO THE CENTO CONFERENCE ON NATIONAL AND REGIONAL AGRICULTURAL DEVELOPMENT POLICY -- ISTANBUL SEPTEMBER 10-16, 1967 BY M.YASIN QURESHI, S.K.GAR, JOINT SECRETARY, MINISTRY OF AGRICULTURE AND WORKS.

INTRODUCTION:

The contribution of the agricultural sector to the gross national product is nearly half of the total and it is the largest single contributor. About 75% of the total exports consist of raw and processed agricultural produce. As end-use, the agricultural sector must not only improve the standard of living of farmers by increasing their real income, but must also produce sufficient food to feed the rapidly growing population; cash crops such as cotton, jute, wool, tobacco, etc.,to feed the industries in the country and lastly, sufficient surplus of exportable commodities to earn the much needed foreign exchange for financing essential imports. At the same time development of the industrial sector itself depends greatly on the prosperity of agricultural sector as the rural population which is in an overwhelming majority is the ultimate consumer of the manufactured items.

This vital position of agriculture has been duly recognised by the Government and Pakistan's Third Five Year Plan which states that 'Development of Agriculture is the sine qua non for the development of country's economy' and gives highest priority to agriculture aiming at the achievement of self-sufficiency in food by 1970.

CAPITAL REQUIREMENTS:

General:

Capital is defined in general terms as that part of wealth which is used in further production of wealth. In Agriculture, wealth is required for increasing the area under cultivation and increasing the yield per acre. The efforts of the Pakistan Government have been directed in both these directions. In the former category, land and water development will provide the essentials for a major surge forward in agricultural out-put. The salinity control and low lift irrigation projects in East Pakistan rank high in investment for Agricultural development.

For increasing the yield per acre, larger and larger supplies of inputs e.g. fertilisers, insecticides and pesticides, improved seeds and improved farm equipment, will be requireed. For these, increased investments in fertiliser plants, plant protection materials and services, seed propagation, manufacture of agricultural machinery including tubewells and pumps will be needed.

Given the above mentioned production inputs, the remaining capital is needed largely for making available sufficient credit to the farmers, for providing adequate number of trained hands to effectively cope with the existing and future agricultural research problems, for extension work to help the farmers in adopting modern farming techniques and for providing modern marketing facilities.

The bulk of the foreign exchange component of the capital requirements of agriculture relates to the import of fertilisers, pesticides and insecticides, aerial spraying planes, agricultural machinery and equipment, e.g, tractors, tubewells, low-lift irrigation pumps and fisheries equipment like teak wood, diesel marine engines, nylon ropes, etc. During the current Plan period (1965-70) foreign exchange component is also needed for the establishment of fertiliser and pesticide manufacturing plants, agricultural machinery and equipment plants, etc. As these industries develop locally, requirements of foreign exchange is expected to decline in subsequent years.

Current Plan Requirements:

For implementing public sector agricultural programme of the current Plan (1965-70) requirements of finances for the main items are estimated as under:-

1.	Fertilisers	3,744.225	million	rupees
2.	Plant Protection	584.977	"	"
3.	Seed Multiplication & Distribution	93.497	"	"
4.	Mechanisation	417.077	"	"
5.	Agricultural Marketing	26.940	"	"
6.	Agricultural Extension	88.320	"	"
7.	Agricultural Research	92.330	"	"
8.	Agricultural Education	112.981	"	"
9.	Soil Conservation	100.720	"	"
10.	Foodgrain Storage	258.603	"	"
11.	Animal Husbandry	148.104	"	"
12.	Forestry	256.709	"	"
13.	Fisheries	169.944	"	"
14.	Others	1764.425	"	"
	Total:-	7858.852	million	rupees

Allied Items:

1.	Irrigation	787,680	million rupees
2.	Drainage, Reclamation & Tubewells	1,132,780	" "
3.	Flood regulation	772.580	" "
4.	Open Canals	197.440	" "
5.	Miscellaneous	265.760	" "
6.	Food manufacture	167.500	" "
7.	Fertiliser Plants	1,400.000	" "
	Total:-	4,640.740	million rupees.

Grand Total:- 12,499.592 million rupees.

In addition to the Public Sector Programme, it is estimated that about Rs.4,000 million will be invested in agriculture by Private Sector during the Third Plan period.

Agricultural Credit:

In agriculture, by and large incomes obtained from farming are too low to leave any appreciable marginal savings with the farmers for reinvestment in the fields. This explains the reason for choronic indebtedness of the agricultural sector and the low production of crops. In other words in an economy that is not self-generating and where capital formation is not taking place, the problem of credit assumes an unusual importance. To induce investment for higher production, additional capital has to be pumped into agricultural sector through the mechanism of well organised credit system.

Nature and Extent of Credit Required:

Under the conditions prevailing in Pakistan, farmers' need of credit fall under two broad categories:-

(a) Credit for productive purposes,
(b) Credit for un-productive purposes.

In the former category are included:-

(i) Long-term credit for the purchase of additional land, sinking of tubewells, construction of embankments, purchase of tractors, pumps, etc.

(ii) Medium-term credit for purchase of livestock, modern tools and implements, well equipment, etc.

(iii) Short-term credit for purchase of fertilisers, improved seeds, etc.

In the category of unproductive credit are included family expenditure, e.g. family consumption, residential construction or repair, social ceremonies, litigation, etc. repayment of debt and other miscellaneous purposes.

It is estimated that credit requirements of unproductive purposes constitute about 68 % of the total requirements while only 32 % is used for productive purposes.

As to the extent of credit requirements of the farmers, the credit Enguiry Commission set up by the Government of Pakistan in 1959 had estimated that ' a minimum ratio of credit to output flow in agriculture was 25 per cent'. Assuming that subsequent development of agriculture has improved the financial position of the farmer by about 5 %, we can take the credit requirements at 20 % of the agricultural product. In 1964-65, contribution of agricultural sector to G.N.P. was estimated at Rs. 21,005 million (1964-65 prices) of which 20 % comes to Rs. 4201 million. The projection for 197. is of Rs. 26,870 million, 20 % of which works out to Rs. 7,374 million by 1969-70. Out of these, need for production purposes at the rate of 32 % are estimated as Rs. 1,344 million and Rs. 2,360 million respectively.

Obviously, it is beyond the capacity of the Government of Pakistan to cater for the credit needs of the farming community by itself. In the circumstances, the largest source of borrowing by the farmer is friends and relatives followed by well-to-do rural people and landlords and village money lenders. The other important source is the Institutional Credit provided by:-

1. Agricultural Development Bank of Pakistan.
2. Co-operatives; and
3. Government Taccavi loans.

The Agricultural Development Bank has a programme to disburse Rs. 1,000 million during the Third Plan period as against Rs.389.4 million disbursed during the Second Plan period. In West Pakistan, the Co-operatives are expected to distribute Rs. 75[illegible] million. Another Rs. 100 million will be provided by Government as Taccavi loan. Figures for East Pakistan are not available.

Next Plan (1970-75) Requirements:

It is difficult at this stage to project capital requirements for the next Plan period. These will depend on the programme yet to be drawn for the agricultural sector. However, USA Aid, sometime back, had worked out the investment required for agriculture during 1970-75. Their estimates are reproduced below without any comments:-

		1965-70 Total	Foreign Exchange Component
		..... in million rupees	
1.	Irrigation, Reclamation & Flood Control	1,908.39	165.96
2.	SCARPS	1,825.00	638.75
3.	Fertilisers.	644.00	479.30
4.	Plant Protection	500.00	250.00
5.	Foodgrain Storage	197.67	19.96
6.	Seeds	75.00	-
7.	Mechanisation	100.00	63.00
8.	Extension Works, Education & Research	328.50	22.45
9.	Forestry	230.12	-
10.	Rural Public Works	2,500.00	-
11.	Animal Husbandry Range Management Soil Conservation	150.15	29.42
12.	Fisheries	52.50	34.13
13.	Economics & Statistics	13.50	-
14.	Agricultural Credit	10,000.00	-
15.	Others	-	-
	Total:-	18,747.87	1,832.97

PAPER ON FERTILIZERS PRODUCTION, IMPORTS, DISTRIBUTION AND CONSUMPTION, 1967 to 1975 — PRESENTED TO THE CENTO CONFERENCE ON NATIONAL AND REGIONAL AGRICULTURAL DEVELOPMENT POLICY, ISTANBUL — SEPTEMBER 10-16, 1967 BY MR.M.YAMIN QURESHI, SK, GAR, JOINT SECRETARY TO THE GOVERNMENT OF PAKISTAN, MINISTRY OF AGRICULTURE & WORKS.

EAST CONSUMPTION.

The use of chemical fertilizers in Pakistan is rather recent. In the year 1952-53, the quantity of fertilizers used did not exceed 14,500 tons of Ammonium Sulphate which was mostly applied to the Tea crop in East Pakistan. Only about 2 to 3 thousand tons were used in West Pakistan. Recognising the importance of fertilizer application for increasing crop yields, the Government adopted measures to popularise their use with the farmers. One of the measures was to give a subsidy on the sale of fertilizers. The rate of subsidy has ranged from 35% to 66% in the previous years. This had the desired effect and the consumption of fertilizers increased from 14,500 tons in 1952-53 to more than 10,00,000 tons (in terms of Ammonium Sulphate) during 1966-67 . The following table will indicate the yearly consumption of fertilizers since 1952-53 to 1966-67.

Year.	Fertilizers consumed. (tons).	
	In terms of A/S.	In terms of Plant Nutrients.
1952-53	14,500	2,900
1953-54	39,400	7,880
1954-55	19,700	3,940
1955-56	49,500	9,900
1956-57	1,32,200	26,440
1957-58	1,33,200	26,640
1958-59	1,19,500	23,900
1959-60	1,53,000	30,600
1960-61	2,49,000	53,900
1961-62	3,00,000	60,000
1962-63	3,36,500	67,000
1963-64	5,88,500	1,17,700
1964-65	6,61,000	1,32,200
1965-66	6,80,000	1,36,000
1966-67	10,00,000	2,00,000

It will be observed that within a period of 15 years, the consumption of fertilizers has increased by over 600 times.

FUTURE PROGRAMME:

The programme for the consumption of fertilizers during the remaining three years of the Third Plan

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(1967-68 to 1969-70) is shown below:-

Year.	Target in terms of A/S. (tons)	Plant Nutrients.
1967-68	12,25,000	3,85,000
1968-69	26,25,000	5,25,000
1969-70	30,00,000	6,00,000

For the year 1960-71 to 1971-75, the tentative targets of fertilizers consumption are indicated below:-

Year	Target in terms of A/S (in tons)	In terms of Plant Nutrients
1970-71	32,50,000	6,50,000
1971-72	35,00,000	7,00,000
1972-73	37,50,000	7,50,000
1973-74	40,00,000	8,00,000
1974-75	42,50,000	8,50,000

INDIGENOUS PRODUCTION OF FERTILIZERS:

At present about 25% of the requirements of fertilizers are met through local production and about 75% through imports. The value of the total fertilizers imported annually amounts to more than 50 million dollars in foreign exchange. This is a great strain on the country's resources. The Government of Pakistan has decided to make the country self-sufficient in fertilizers as soon as possible. The present capacity of fertilizers production in the country is as follows:-

	Location	Type of Fertilizers produced	Existing Capacity Per year.	
East Pakistan	Fenchuganj	Urea	1,17,000	Tons
West Pakistan	Daudkhel	A/Sulphate	50,000	"
	Multan	Urea	59,000	"
		A/Sulphate Nitrate	1,03,000	"
	Lyallpur	Single Super Phosphate	18,000	"
		Total:-	3,47,000	"

Expansions of the existing factories have been sanctioned to increase their capacity by 3,76,000 tons per annum as follows:-

Location	Fertilizer	Additional Capacity sanctioned (tons)
Daudkhel	A/Sulphate	40,000
Multan	Complex Fertilizers	3,00,000
Lyallpur	Single Super-Phosphate	36,000
	Total:-	3,76,000

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In addition, Government has approved the setting up of the following new plants for the manufacture of fertilizers to be established in the near future:-

	Location	Type of Fertilizer	Annual Capacity (tons)
East Pak.	Chittagong (i)	Triple Super-Phosphate	32,000
	(ii)	Hypophosphate	1,55,000
	Ghorasal	Urea	2,30,000
	Khulna	Superphosphate	1,20,000
		Total(E.P.):-	5,37,000
West Pak.	Mari(Esso)	Urea	1,70,000
	Daudkhel	A/Sulphate Nitrate	3,00,000
	Karachi	Triple Super Phosphate	1,50,000
		Total(W.P.):-	6,20,000
		Grand Total:-	11,57,000

Additional proposals from private parties for the establishment of plants of the total capacity of 11,70,000 tons are under consideration of the Government. Most of these plants are expected to get into their full capacity by the year 1974-75, when they will be producing more than 3 million tons of different types of fertilizers which will be sufficient to meet the country's demand of fertilizers.

DISTRIBUTION OF FERTILIZERS:

The distribution of fertilizers is at present undertaken by the Agricultural Development Corporations and the Cooperatives in the Provinces. In East Pakistan, the imported as well as indigenous fertilizers are being distributed by the Agricultural Development Corporation which itself handles fertilizers upto Thana level. The retail sale is done through private dealers approved by the Corporation. The Corporation has appointed more than 9000 commission agents in 13 out of 17 districts of the Province. Agents for the remaining

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districts are being appointed. This system has not only improved the efficiency of distribution programme but has also relieved the extension staff of the Agriculture Directorate to devote their full time to the education of the farmers.

In West Pakistan, fertilizers are distributed by the Agricultural Development Corporation and the Cooperatives. The former handles 25% of both the imported and indigenous fertilizers while the latter distribute 75%. This system of distribution has been further streamlined to bring in the private trade. It has been decided to entrust the distribution of fertilizers and seeds to commission agents in the whole of West Pakistan. The West Pakistan ADC depots numbering 211 would function as wholesale depots for bulk supply to the commission agents approved by the Corporation. The wholesale depots would not sell less than 20 tons of fertilizers to a commission agent for distribution to the consumers. It is proposed to appoint 2,400 commission agents in West Pakistan who will be directly under the control of the Agricultural Development Corporation. In addition to these agents, three private firms, namely, Dawood Industry Ltd., Pakistan National Oils and FOSFO Fertilizer Ltd. have also been invited to take part in the distribution of fertilizers. These three firms will open their depots all over the province and would distribute fertilizers at the control rates. These firms have been invited with a view to providing sale competition. The private distributors will be allowed a surcharge of Rs. 1/= (U.S. $ 0.21) per bag or Rs. 20/=(U.S. $ 4.20) per ton for Urea, Triple Super Phosphate and 50 paisa(U.S. $ 0.10) per bag or Rs. 10/= (U.S. $ 2.10) per ton for Ammonium Sulphate and Nitrate. This surcharge is allowed for sale five miles beyond Market towns.

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The Cooperatives Organization distributes the entire indigenous production through its Service Societies. If it is willing and able to sell additional quantities it can buy from the Agricultural Development Corporation depots at market towns like other dealers. The functioning of the Service Cooperative Societies has been improved by increasing their maximum credit limit to Rs. 10,000 (U.S. $ 2100.00). Better coordination has also been effected by the Cooperative Department between its Credit and Service Societies. To encourage the small farmers to purchase fertilizers, the Agricultural Development Bank has lowered its minimum limit of lending from Rs. 100 (U.S. $ 21.00) to Rs. 50 (U.S. $ 10.50) to meet their credit requirements.

To further step up the sale of fertilizers in West Pakistan, a Committee consisting of representatives of Agri-cultural Development Corporation, the Agricultural Department, and the Agricultural Development Bank has been constituted to supply fertilizers on credit in rural areas. Vigorous educational campaign, particularly, in regard to application of compound fertilizers is also being undertaken through the Basic Democracies and the Union Councils.

PAPER ON IRRIGATION PRACTICES AND DEVELOPMENT
PRESENTED TO THE CENTO CONFERENCE ON NATIONAL
AND REGIONAL AGRICULTURAL DEVELOPMENT POLICY
ISTANBUL - SEPTEMBER 10-16, 1967

BY

MR. M. YAMIN QURESHI, B.A., G.A.R.,
JOINT SECRETARY TO THE GOVERNMENT OF PAKISTAN
MINISTRY OF AGRICULTURE AND WORKS

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1. Introductury

Pakistan's total geographical area is 233.9 million acres. The cropped area amounts to 68.77 million acres. In 1965-66, the net area sown was 56.4 million acres. Out of the total area under cultivation, nearly 62 per cent is under irrigation.

West Pakistan links up with the middle-east and East Pakistan with south-east Asia. The west wing has hot dry climate, not far from desert influces, with a low rainfall ranging from 4 inches in the south-west to 40 inches near the foot hills of the Himalayas in the north. The east wing has a humid climate for much of the year with its lowest average annual rainfall around 60 inches on the western side but touching 200 inches on the east. In East Pakistan, 63% of the total area is cultivated, compared with only 20 per cent in West Pakistan; more than half of this 20 per cent is irrigated.

There are two well-defined crop seasons in Pakistan (i) Kharif from April-September, (ii) rabi from October-March. Sometime, intermediate crops are grown between these seasons which are known as 'ziad' (additional) crops in West Pakistan. The major kharif crops are jute, cotton, sugarcane, rice, maize, jowar-bajra (millets), pulses and groundnut. The major rabi crops are wheat, barley, gram, rape and mustard, and party rice in East Pakistan.

The two outstanding features of agricultural production in Pakistan are the wide variety of crops and the preponderence of food crops over non-food crops. It may be noted that the area under food crops was 47.72 million acres in 1965-66 against 23.83 million

/acres

acres under other crops.

Rainfall in Pakistan is unequally distributed throughout the seasons. It is also unevenly distributed over the surface of the country and is liable to frequent failures. Because of variation in the intensity and pattern of rainfall and also of soil type in various regions of Pakistan, timely artificial application of water for the proper crops growth is an important factor. Further, because of the limited available supplies, it is of importance to utilize every cusec of water for the maximum crop yield and, therefore, the subject of water requirements of crops has received attention of agriculture and irrigation departments in the country for over a century.

2. Irrigation sources:

The enormous difference which irrigation can make to yields is amply demonstrated in many parts of the world. Pakistan is blessed with considerable supplies of river water. Chief sources of irrigation are (i) natural precipitation, (ii) flow irrigation from rivers and (iii) lift irrigation from surface and underground. The detailed situation is discussed below:

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The entire province is laced with a dense, network of water courses branching out of the three principal rivers, the Ganges, the Brahmaputra and the Megna. The total volume of water brought in annually by these rivers is estimated at approximately 925 million cubic feet. These rivers and their branches are great assets to the province in many respects. There are about 2,700 miles of navigable channels open during the Monsoon and about 1,800 miles open during the dry season. These water courses can provide irrigation water during the dry season enabling a second or even a third crop to be grown in parts of the province. The flood plains of the rivers are

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inundated during the monsoon and when the flood recedes, a large volume of water is retained in innumerable inland water reservoirs with which the whole countryside is interspersed. Some of the low lying pockets retain water during the entire year, while others become dry during the winter season. The number of such swamps is large. They are scattered over almost all the districts of the province. These water reservoirs combined with the high rainfall, indicate that East Pakistan is endowed with plenty of water resources. Yet crops do dry up. Sowings are delayed and the yield is reduced for want of water. The limiting factor in East Pakistan is an uneven distribution of the rainfall which divides the year into well-defined dry and wet seasons. 85 per cent of the rainfall comes during the five months from May-October. The flat topography of the land subjects it to flooding in the rainy season when about 76 per cent of the flat lands are inundated by rain or river water and the only crops that can be grown are rice and jute. In the dry season, only a small part of the land is put under a second crop.

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In West Pakistan, a vast flat,plain stretches from the foothills of the Himalayas in the north-east to the Arabian sea in the south. Bordered by desert on the south-east and by the hills on the west, it is traversed by five great rivers, the Indus, the Jhelum, the Chenab, the Ravi and the Sutlej in the northern region of the Punjab and by the Indus river after their junction in the southern region of Sind. These rivers have a marked seasonal behaviour of high flood during the melting of the snows and during the rains, followed by a steep drop to a low discharge for the rest of the year. With the low rainfall and dry climate, the region originally supported only a small population and a semi-pastoral way of life, modified by the custom of the people using the flood water in inundation canals to grow a

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seasonal crop in areas adjacent to the rivers. The soils of the regions are inherently good and over the last century, the semi-desert plain has gradually been transformed by the introduction of the world's largest irrigation system. To-day the area of irrigated land - 28.5 million acres is 62 per cent of the total cultivated area of West Pakistan and its present agricultural importance is indicated by the fact that 65 per cent of wheat acreage, 99 per cent each of rice and cotton acreage and 98 per cent of sugarcane acreage in West Pakistan is irrigated.

Another important source of irrigation in Pakistan are the numerous tanks in the countryside. They have been formed particularly in the eastern wing, over many centuries by just a simple earthen bund across the low lying area.

The third important source are the numerous wells all over the country particularly in West Pakistan. They are very often shallow.

3. Irrigation practices:

The presence of moisture in the soil is essential for the plants to utilize food material, to regulate the temperature and for the proper activities of certain biological and chemical processes. All these important functions can only be efficiently performed if the moisture present in the soil is neither in excess nor deficient. In order, therefore, to make the best use of the irrigation water and to avoid the harmful effects which generally follow in the wake of its excessive application, adequate quantity and timely application are imperative. The problem of irrigation farming is universal but it has added significance to Pakistan as the area irrigated in this country extends to 30 million acres. To prepare the field, a large quantity of water has to be let in. This is allowed to soak the soil so that the field is ploughed later at the optimum moisture. Subsequently water has to be continuously applied in the fields.

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Only when the crops are getting ready for harvest the fields are allowed to dry. Determination of the water requirements of various crops i.e., cereals, oilseeds, cotton, sugarcane, vegetables, fodder and garden crops, under the varying conditions of soil and climate as affected by cultivation, inter-culture, manuring, crop rotation, time of sowing, times and system of cultivation, method of sowing, spacing etc., have been found out to produce the maximum economic yield. According to the general practice the following table will indicate the quantity of water being applied by the farmers to various crops:

Water requirement of various crops in the plain areas of West Pakistan

S.No.	Name of crop	No.of waterings applied by farmers	Acre inches of water requirement for maturing of the crop	Remarks
1.	Wheat	4	13	Normal rainfall during the growth period is 3-4".
2.	Rice	19	76	Normal rainfall during the growth period is about 8".
3.	Maize	8	25	-do-
4.	Sugarcane	18	72	-do-
5.	Cotton	8	25	-do-
6.	Rape and Mustard	3	10	Normal rainfall during the growth period is 3-4".

Normally there are five channels in a rectangle of 25 acres. Therefore, each water course passes through each field, thus facilitating irrigation. Optimum size of irrigation bed has been found to be 1/8th of an acre in case of Rabi crops and ¼th of an acre for Kharif crops being the best and most economical sizes as these effect saving of irrigation water to the extent of 14 per cent. Water is also being economised by proper levelling of the field which is possible on small area field and

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straightening of water channels. By following block cultivation the wastage of water by seepage in water channels is being avoided.

4. "Duty" of water:

In the canal system, "duty" is expressed in terms of the number of acres that can be successfully raised for continuous flow of one cusec of water right through the season. The "duty" varies with the nature of the sub-soil water and the extent of rainfall during the season. In West Pakistan, the designed "duties" vary from 45 to 75 per cent. This is due to the fact that in areas of low duty, there are a number of open surface wells on the banks of the rivers which supplement the canal and in areas of high duty the sub-soil water is either unfit for irrigation or very deep and uneconomical to lift. One cusec of water is generally supplied for 352 acres in West Pakistan envisaging the cropping pattern as 88 crop acres during kharif, 88 acres fallow and 176 crop acres during rabi season. In contrast, one cusec is being supplied to 70 acres in USA and 100 acres in UAR under similar climatic conditions. The most important improvement in the agriculture of West Pakistan can, therefore, be expected from the use of additional water on the lands presently irrigated with inadequate water supplies.

5. Irrigation methods:

Modern and effective irrigation can be realized with the completion of two distinct steps. The first step is to supply irrigation water to the farmers' turn-out and the second is to assure that this water be utilized efficiently on the farm.

Supplying irrigation water to the farmers' turn out is possible only if there is adequate supply of water and properly designed and constructed irrigation system. Maximum utilization is possible when the lands are prepared to uniform distribution of

/irrigation

irrigation water and protected from flood water and high water table by adequate drainage system. Successful operation of an irrigation system requires its regular maintenance and close cooperation with the farmers to prevent wasteful operation and maintenance practices.

The irrigation head-works constructed by the Government are operated by operation & maintenance Engineers. The canals have been bifurcated into branches, distributories and minors for the sake of proper distribution of water and convenience. Flooding is the chief method of applying irrigation water to crops.

From the outlets water courses take the water to the land to be irrigated. In West Pakistan, the practice is to align the water courses on the Government expense till a 25 acre limit is reached. Below 25 acres, the cultivators are expected to provide land and to form their own water courses. Very often irrigation is carried on from field to field.

6. Drainage:

The need for drainage has been realised only as an outcome of the deterioration and the dangerously decreasing fertility and productivity of agricultural land due to their salinization and waterlogging. Drainage now is the main hope for restoring these lands to their once fertile and productive state, improving their produce, increasing their yields and ultimately furthering the economic development of the country.

In the plain areas the country is flat. The water table has risen. Consequently the crops suffer due to the suffocation of their roots in the water and the accumulation of salt over the surface of the land and in the roots zone of the crops. This high concentration of salt obstructs the osmosis process by which the plant roots obtain their food material.

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Consequently, the crops die. There is need to maintain efficient drains. Drainage projects already executed constitute only a small percentage of what is required in area and expenditure. Even in this small portion of executed drainage projects, only the outlet pumping stations and few main and lateral collector drains have been completed. The problems of constructing the farm drains, the search for a more favourable and less hazardous drainage outlet and education of the farmers for better understanding of more efficient irrigation water use are among the main drainage problems being studied.

On the irrigation side, there is a good bit that can be done to economise the use of water. Lining of canals and their branches to prevent loss by seepage, proper design of canals and outlets, laying out of water courses so as to enable each field to be irrigated directly, are some of the methods.

7. Development:

Irrigation is undoubtedly the mainstay of agricultural development in the country. There are large areas where rainfall is inadequate and erratic. It is seasonal, fluctuating from year to year and often ill-distributed over the season. Therefore, our problem is one of bringing water either from great distance or from under the earth, conserve it and distribute it to the fields. There are however, some tracts where rainfall is adequate and somewhat assured but it drains off in a rush. There, the problem is one of storing the rain water and conserving the moisture. Concerted efforts are being made in Pakistan to step up the irrigation potential fast enough to increase agricultural production.

Uncontrolled use of irrigation water is known to aggravate the problem of waterlogging, salinity and alkalinity in intensively irrigated tracts with comparatively flat slopes and inadequate drainage outlets. In Pakistan, a total of about

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5 million acres of land is so affected. In the major part of this affected land, over-irrigation for long periods with inadequate drainage has been harmful. Investigation carried out in these areas have led us to the conclusion that controlled use of irrigation water is not only essential for bringing more area under irrigation from the same quantity of water but also for preserving the fertility of the land. We have also learnt the lesson that drainage is an essential complement to all irrigation projects to ensure effective and sustained agricultural benefits from the land.

The problem of water management and optimum use of irrigation water requires concentrated and coordinated efforts on the part of the various agencies and disciplines, such as the Agriculture and Irrigation Departments, the organization of Basic Democracies, extension services, small dams organization, research and training institutes. Although, it is ultimately the cultivator who has to bring about the optimum use of water for raising maximum yields, it is for us to ensure that he is equipped with the requisite know-how and motivated with true purpose. Integrated activities in various fields are, therefore, necessary to provide the requisite financial, technical, material and organization support to the farmer.

8. Minor Irrigation:

Extensive irrigation is achievable through minor irrigation. Minor irrigation includes works, such as open wells (dug wells), tubewells (deep wells), small storage and diversion works and pumping installations on rivers and streams for lift irrigation. Open wells form an important item of minor irrigation contributing more than 2.5 million acres of total irrigation in the country. They are scattered in almost all parts of West Pakistan. Great priority is being accorded in Pakistan to boring and deepening of wells in order to augment

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their discharges. The indigenous old methods of lifting water from open wells are being replaced, at a fast rate, by power pumps run by diesel or electricity. Power pumps including diesel engine as well as electric motors are being manufactured in the country in sufficient numbers and are available at reasonable prices. Efforts are also being made to make the electric power available to the cultivators at a rate not exceeding 8 paisa (1.7 US cents) per unit.

9. Tubewell irrigation:

In West Pakistan, under the plains of the former Punjab and Bahawalpur lies a vast reservoir of water which can be used to store and supply additional water by tubewell pumping.

10. Government tubewells:

The former Punjab Government installed 20 tubewells between 1938 and 1940 in ares close to Lahore for irrigation. The next big schemes for pumping groundwater were the Rasul Project and the Central Tubewell Scheme under which about 1,500 tubewells were installed in the Rechna and Chaj Doabs between 1944 and 1953 with a view to lowering the water table and providing additional water for irrigation. More recently the West Pakistan Water & Power Development Authority (WPWAPDA) has installed about 2,000 tubewells in Salinity Control and Reclamation Project Number one (SCARP I) in the Rechana Doab. These tubewells were installed in 1959 and 1960 and commenced operation in 1961-62. About 400 additional tubewells have been installed in SCARP 2 area in the Chaj Doab between 1961-62 and 1963-64.

11. Private tubewells:

Installation of tubewells for agricultural use is of recent origin. The Department of Agriculture has been helping the farmers in installing tubewells for the last thirty years.

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The Department undertakes the drilling of bore holes and installation of pipes and strainers. The remaining work, i.e., supply and installation of pump and engine and the construction of pump house etc., is done by the farmers themselves. Pipes and strainers may be purchased from the Department of Agriculture or from the local market. Private drillers have also been drilling wells for the last twentyfive years or so, but have entered this field in a big way during the last six years. The total number of tubewells increased from 1,200 in 1954-55 to 4,000 in 1959-60 showing an increase of 3,000 tubewells during the first plan period. The number further increased to 12,400 by 1962-63 showing an increase of over 8,000 during the first three years of the second plan period (1960-61 to 1962-63). There were in all, in the middle of 1964, 24,000 private tubewells in the northern zone and 25,000 tubewells in the whole of West Pakistan. Now the number of tubewells by the end of 1966-67 is reported to be about 45,000 in the whole of West Pakistan.

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Judging from the total rainfall in East Pakistan which averages 85", any outsider will be of the opinion that East Pakistan agriculture does not require any irrigation facilities. However, the position is quite different. Thus on account of water scarcity in winter most of the farm land remains unproductive for five months in a year.

12. Low lift pump irrigation:

The low lift pump irrigation is most common and popular, consequently the Agricultural Development Corporation, East Pakistan, has been hiring out pumps to cultivators to irrigate the land adjoining to perennial rivers and revulets. About 3,600 power pumps were hired out for this purpose during the year 1966. At present, most of the pumps are localized in the low lying tracts of the province.

/13. Tubewells

13. Tubewells:

Tubewells have been introduced in East Pakistan recently during the last five years or so. At present, the total number of tubewells in East Pakistan is estimated to be between 500 and 600.

14. Irrigation Schemes:

In addition, the following schemes have also been at various stages of progress under EPWAPDA (a) to bring more area under irrigation, (b) to improve irrigation facilities to the existing culturable lands, (c) to regulate floods to protect culturable lands, (d) to provide drainage and (e) to construct embankments for checking the culturable lands going out of cultivation because of floods and tidal bores.

Name of scheme	Area to be improved/irrigated	Remarks
1. Ganges Kobadak Project (Kushtia Unit)	7,50,000 acres	-
2. Teesta Project	13,35,000 acres	-
3. Coastal Embankment Project	34,00,000 acres	-
4. Ground-water Development & Pump-irrigation in northern districts.	1,86,800 acres	380 tubewells, 800 diesel lift pumps, 60 electric low lift pumps.
5. Dacca-Narainganj-Demera Project	18,000 acres	-
6. Barhamputra Flood Embankment-Project from Pulchari to Sirajganj	5,93,500 acres	-
7. Tippera-Chittagong Multi-purpose Project	2,35,000 acres	Include 1,35,000 acres protection from flood.
8. Old Barhamputra Multi-purpose Project - phase I.	21,50,000 acres	-
9. Manu River Project	83,800 acres	Include 56,200 acres protection from flood.
10. Southern Rajshahi Irrigation Project	1,65,000 acres	-
	Total: 89,17,100 acres	

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Many other small schemes are in progress under EPWAPDA which will bring more area under irrigation and also protect a substantial area from floods.

PAPER ON ENERGY AND MACHINERY REQUIREMENTS FOR INCREASING CROP YIELDS PRESENTED TO THE CENTO CONFERENCE ON NATIONAL AND REGIONAL AGRICULTURAL DEVELOPMENT POLICY ISTANBUL - SEPTEMBER 10-16, 1967

BY

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In order to boost up agricultural production, the farmers must be helped in all effective ways with aids of production. Among these aids, improved agricultural machinery and energy occupy a very important place. In any scheme of increasing agricultural production this aspect must receive adequate attention.

The primary objective of agricultural machinery is to have a good tilth to bring about the most favourable condition in the soil for the germination of seeds and subsequent growth of plants. In Pakistan, a great majority of cultivators are practising agriculture in the same pattern as their fore-fathers did for many generations. The population growth has been more rapid than the rate of increase in agricultural production with the result that the old method cannot provide sufficient food to the people and sufficient raw-material for an expanding industry.

To meet this challenge, the area under crops is to be increased and modern techniques of agricultural adopted. For this purpose it is necessary to reclaim new lands. The Department of Agriculture, West Pakistan, is maintaining a fleet of 1200 bull-dozers which are working for the farmers at subsidized rates. In many parts of East Pakistan, it is possible to raise two to three crops on the same land during a year provided in addition to the availability of water facilities, quick tillage of the land is accomplished immediately after harvest. Intensive agriculture also requires quick ploughing where irrigation

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facilities are available.

The Government of Pakistan has limited the makes of tractors to be imported into the country to the following :-

Massey Ferguson (U.K.)
International Harvester (U.K.)
John Deere Lanz (West Germany)
Deutz (West Germany)
Zadrugar (Yugoslavia)
Zetor (Czechoslovakia)
Holder (West Germany)
Byelarus (U.S.S.R.)

It has been made obligatory on all the importers of these tractors to open a chain of workshop all over the country and keep a good stock of spare parts so that tractors users do not face any difficulty in getting their tractors repaired whenever they need it. It has also been made compulsory on the tractor importers to maintain mobile workshops, so that the tractor owners get repair facilities at convenient places. The tractors are becoming popular in the country and the farmers have started adopting mechanization on a good speed. The Agricultural Development Bank has started giving loans to the individual farmers who are interested in buying a tractor. This loan is returnable on easy instalments and is working as a good incentive. The demand is increasing every-day and we are not in a position to meet the demand in full for want of foreign exchange. In view of the increasing demand of the tractors, the Government have given permission to M/s Adamji Deutz Ltd., to manufacture Deutz tractors in the country. In the recent past we imported about 3000 -4000 tractors per annum and keeping in view the trend, the annual requirements by 1970 is estimated around 7000-8000 tractors per year. This tempo is bound to result in increasing agricultural production.

West Pakistan has been blessed with rivers and a net work of canals. Yet the full requirements of water are not met. In East Pakistan, irrigation is necessary in winter months.

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For the 1965-70, mechanization programme, the goal of 15,000 tubewells for West Pakistan has been set. The following table gives past performance and the anticipated achievements :-

	1955-60	1960-65	1965-70
No. of tubewells	1600	5750	15000

Besides the activity of the Department of Agriculture a good number of private firms are engaged in sinking tubewells for the farmers and they are expected to instal larger number than the Department of Agriculture. The Government is also giving subsidy to encourage smaller farmers for installation of open wells and tubewells which have been continued during period 1965-70. These tubewells are being run by the electric motors and I.C. diesel engines. The electrical tubewell initially costs an average of Rs. 3000 less than the diesel engine tubewell. Even the operational cost in the case of electrical tubewell is less than the diesel engine tubewell. The provision of elictricity seems to have been the major cause of rapid increase in the installation of tubewells in certain districts of West Pakistan, but the majority of tubewells in the country are being run by the diesel engines. The position seems to have developed some-what in the following way. Provision of electricity enable some farmers to make good profits from the installation of tubewells. When these installations demonstrated the profitibility of tubewells others, even when they could not get electric connection, drilled the wells and installed diesel engines. It was thus demonstrated that good profits were possible even with diesel engine. More farmers have began to instal diesel engine tubewells and the number is fast increasing.

The Water Resources Development Programme during 1965-70 is expected to serve about 4.8 million acres of new area and 19.8 million acres of already cultivated land. The area actually showing incremental outputs will be less than these totals because of the transitional process and lag between the commissioning of the

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areas and their production. It is estimated that in West Pakistan 1.7 million acres of additional land will be cropped. 8.3 million acres of already cultivated area will improve in acre yield and 2 million additional acres will be added as a result of high cropping intensities. On the same basis it is estimated that in East Pakistan the irrigation and reclamation programmes will bring under cultivation 2.1 million acres of additional area and 2.7 million acres of already cultivated area will be improved by 1970. The overall position of the area cropped at the end of the each of the three development plan periods resulting from implementation of all water development and drainage schemes is shown in the following table :-

Estimated area under crops and likely additions during the Second (1960-65) and the Third (1965-70) Plans as a result of irrigation and drainage projects.

	E.P.	W.P.	Total
	(In million acres)		
Cropped area at the end of the First Plan.	26.6	34.2	60.8
Additions to cropped area by the end of the Second Plan	0.4	1.4	1.8
Additions to the cropped area during the Third Plan	2.1	3.7	5.8
Total cropped area expected by the end of the Third Plan.	29.1	30.3	68.4
Existing area estimated to have improved during the Second Plan.	2.4	5.8	8.2
Existing area likely to be improved during the Third Plan.	2.7	8.3	11.0

From the fore-going paragraphs it can be concluded that if the following important factors are correctly implemented it would increase the crop yields :-

Suitable machinery for cultivating and seed bed preparation.

Supply of irrigation water

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Timely supply and correct application of fertilizers.

Supply of good seeds.

Incentive to the farmers to adopt modern techniques of Agriculture.

Government while laying emphasis on increased production is not neglecting the producers. Any betterment of the farmers has to come out of his real income. As far as the question of increasing the real income of farmer is concerned, this would be achieved mainly by increasing output of individual farms. To lessen the burden of the cost of production on the farm and as a measure to popularise improved methods and farm practices, Government have been providing a number of incentives in the form of subsidies on various inputs and fixing guaranteed minimum prices. Facilities for cold storage for fruits and vegetable, particularly potato, is being expanded in the country. Government has recently announced a four years' tax holiday for cold storages.

As regards the effect of mechanization on the displacement of labour, there is a considerable difference of opinion in the country regarding the role of mechanization in agriculture and its impact on the agricultural economy as a whole. While it is admitted at all ends that machine power is desirable and necessary not only to save human beings from the drudgery of manual labour but also to increase the efficiency of agricultural operations, it is on the other hand contended that the introduction of machinery in agriculture will create wide-spread un-employment among the rural population unless the displaced people can be absorbed in alternative occupation. It is true that industrialisation in Pakistan has not yet attained such a pace as will enable the surplus population displaced by mechanization to be absorbed in industry as it

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has been the case in other advanced countries of the world. The value of mechanization, however, should not be judged from these points of view alone or only from the point of view of foreign exchange expenditure involved in importing machinery from abroad. On the other hand, its value should be judged from its likely contribution to increase of production and consequent creation of new jobs in the rural population by opening up alternative trade avenues for them based on agricultural products and increased production will save foreign exchange by reducing or stopping food imports and will earn more foreign exchange by stepping up export of non-food commodities. There is evidence to show that jobs such as general cultivation seed-bed preparation and land reclamation can be done more efficiently and with greater productivity with the help of machinery rather than with the traditional hand operated or bullock drawn implements. The question is not, therefore, whether machines are to be introduced in agriculture or not but to determine the nature, degree and pace at which it should be introduced so that there may not be any serious and sudden set-back in the position of rural employment. With limited financial resources and want of trained technical personnel available in the country, it cannot be expected to introduce mechanization throughout the country in a short period. This will thus provide the necessary time lag for sufficient progress to be made in the field of industrialization and development of small industries so the adverse effect of mechanization on the employment of labour can be largely put off.

There is no doubt that there is abundance of cheap labour in the country and complete mechanization may create problem.

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So the midway approach must be recognized. The need of transformance of agriculture from bullock economy to tractor economy or from traditional to mechanization farming must be gradual. This should take place in a phased programme keeping in view the desire of the people to mechanize their farming operation, their ability to pay for aquisition of the needed technological know-how. In this manner the problem of displacement of labour can be averted.

PAPER ON INCENTIVES FOR PRODUCTION, PRICES, MARKETS
PRESENTED TO THE CENTO CONFERENCE ON NATIONAL
AND REGIONAL AGRICULTURAL DEVELOPMENT POLICY
INSTANBUL - SEPTEMBER 10-16, 1967

BY

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The Level and Stability of Prices

The main crops grown in Pakistan are rice, wheat, jute, cotton, tea and sugarcane. The level of their prices and the measures taken by the Government to maintain stability in these prices are discussed below.

Wheat From 1942 to April 1960, marketable surplus of wheat in West Pakistan used to be procured and distributed by the Government according to prices fixed from time to time. From May 1960, procurement and distribution of wheat by Government were abolished and all restrictions on prices and movement were withdrawn. Besides, as an incentive to production, a higher floor price of Rs.13.50 per maund was fixed by the Government as against Rs.12.50 per maund during compulsory procurement years. Government declared to purchase any quantity when offered at this rate. The measure was taken as an incentive to guarantee a fair price to the growers. At the same time, consumers were afforded protection from inflationary price rise due to shortage or speculation, by maintaining sufficient reserve stock built up from imports from outside and releasing parts thereof to the consumers on fixed price basis. Control on the distribution and price of imported wheat has, however , been continued. The price of imported wheat was reduced to Rs.14.00 per maund in April 1962 to give relief to consumers but again raised to Rs.15.00 per maund from November 1963 to safeguard the interests of the growers. From 1.6.66, all subsidy on imported wheat has been withdrawn and the issue price has been further raised to Rs.17.25 per maund. The local wheat,

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by virtue of the consumers' preference for it and superior quality, continues to fetch a premium price which varies from Rs.25 to Rs.35 per maund in different markets.

Rice West Pakistan is slightly surplus in rice while East Pakistan is deficit. The surplus rice of West Pakistan has continued to be procured by the West Pakistan Government from main producing districts under the Monopoly Procurement Scheme at prices declared for the purpose from season to season. Fine varieties of rice are procured for export and coarse rice for supply to East Pakistan. There has been no change in the procurement

prices of Begmi, (medium class rice) and Kangni and Joshi (coarse) varieties of rice during 1960-61 to 1965-66. The price of Kangni and Begmi varieties remained at Rs.16.00 and Joshi rice at Rs.15.50 per maund. The price of Permal (superior) rice was, however, raised from Rs.18.00 per maund in 1959-60 to Rs.19.00 per maund in 1961-62 which continued upto 1964-65. During 1965-66, it was further reduced to Rs.17.50 per maund. The present procurement prices have been fixed at Rs.19.00 for Kangni, Rs.18.50 for Joshi and Rs.20.00 for Begmi varieties. In the case of Basmati rice, the price was raised from Rs.23.00 per maund in 1959-60 to Rs.24.00 per maund in 1960-61, Rs.25.00 in 1961-62, Rs.26.00 in 1962-63 and Rs.28.00 in 1963-64. The present procurement price is Rs.31.00 per maund. The different varieties of rice procured during 1960-61 to 1966-67 are given below.

	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66
	(Quantity procured '000' tons)					
Fine Rices						
Basmati	77.3	76.8	88.1	94.7	125.4	130.6
Permal	19.7	17.7	17.9	14.3	10.3	11.7
Begmi	22.7	29.4	30.5	27.3	16.9	15.0
Total:-	119.7	123.9	136.5	136.3	152.6	157.3
Coarse Rices						
Joshi	139.2	162.5	180.2	152.8	126.2	192.1
Kangni	35.6	47.9	66.8	65.2	65.1	45.3
Total:	174.8	210.4	247.0	218.0	191.3	237.4
Grand Total:	294.5	334.3	383.5	354.3	343.9	394.7

East Pakistan has been pursuing a free market policy for rice since 1950. From January 1960, rationing was abolished in 16 out of 19 urban areas, and all procurement was made voluntary except in border areas as an anti-smuggling measure. Procurement and floor prices were fixed

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by the Government at Rs.19.31 per maund for rice (medium quality) and Rs.12.00 per maund for paddy. The distribution prices have been fixed at Rs.29.60 per maund for rice and Rs.15.00 per maund for paddy. With a view to guard against inflationary tendencies, Government have been maintaining sufficient reserves of both wheat and rice in East Pakistan through imports from foreign countries and despatches from West Pakistan.

Free market prices (annual average) of rice in Dacca and Chittagong markets and wheat in Lahore, Multan, Lyallpur and Sargodha during 1961 to 1967 were as follows.

(Prices in Rupees per maund)

Year	Rice		Wheat			
	Dacca	Chittagong	Lahore	Multan	Lyallpur	Sargodha
1961	25.73	25.47	16.29	15.58	16.36	15.63
1962	27.27	24.91	14.40	13.57	14.84	14.21
1963	28.01	28.58	14.76	14.35	15.85	14.81
1964	24.21	23.73	18.31	16.96	17.96	17.00
1965	28.96	27.24	16.88	15.43	17.49	15.66
1966	34.45	36.96	18.64	17.82	18.52	17.67
1967 (Jan-June)	41.87	41.94	30.51	29.46	31.81	30.05

Jute In the case of jute, Government abolished "Regulation" on its cultivation in 1960. However, Export Price Check measures continued for checking under-invoicing and thereby arresting fall in the internal price. Due to two successive big crops in 1961-62 and 1962-63, the price of jute began to fall from early 1962. With a view to arresting the downward trend and guaranteeing a fair price to the growers, the Government of Pakistan fixed minimum prices at grower's level for loose jute, both assorted and un-assorted, for internal consumption as well as for export. For the current season, the minimum grower's price has been fixed at Rs.26 to Rs.28 for different varieties. Simultaneously, Buffer Stock Operation Scheme was also introduced by the Government.

Cotton In the case of cotton a free trade policy has been followed, but with a view to establishing its prices and making it competitive in the foreign markets, Government have continued to adjust the export duty from time to time. Export duty on staple cotton was reduced from Rs.150 to Rs.75 per bale in July 1959. It was further reduced to Rs.25 per bale in November 1962, Rs.20 per bale in August 1963 and Rs.10 per bale from June 1964, which still continues. In the case of desi (coarse) cotton, it was reduced from Rs.50 to Rs.40 per bale in July 1959, Rs.25 per bale in August 1961

Rs.20 per bale in August 1963 and Rs.10 per bale from 1964, which still continues. The duty on coarse cotton was totally abolished from August 1961. Previously, it was Rs.20 per bale.

Besides reduction in export duty, sale tax on cotton was also abolished from the beginning of 1964-65.

Tea The consumption of tea in the country has been increasing at a faster rate than its production, thus resulting in decline in export. With a view to increasing its export, Government introduced separate auctions for export and internal consumption and have been fixing separate quota for different gardens. Government have further promulgated Tea Ordinace 1960 for controlling price, distribution and movement of tea for internal consumption. Under the Ordinance, Government fixed maximum wholesale and retail prices for loose tea. This measure continued till the end of 1962-63. Since then, there has been no control on tea for internal consumption. In the case of export sale, there has been no control and prices ruled according to international supply and demand position. As an incentive for export, the export duty on tea was reduced from 38 to 28 paisa per lb. from September 1961 which was further reduced to 15 paisa per lb. in June 1962.

Sugarcane In the case of sugarcane, Government have been maintaining control on procurement and distribution of white sugar and also fixes the minimum price of sugarcane for the sugar mills from the declared "Sugarcane Zone". Prior to 1961-62 season, entire production of white sugar used to be procured by the Government and its entire import was conducted on Government account. From 1961-62 season, however, the mills have been allowed to sell a portion of their produce in the open market and imports of sugar have been allowed through normal trade channel.

Ex-factory price of sugar for 1965-66 and prices of sugarcane are given below.

Ex-Factory Price of Sugar 1965-66

East Pakistan Rs.56.55 per maund

West Pakistan Rs.51.01 per maund

Prices of Sugarcane (In rupees per maund) { US $ = Rs. 4.761 / maund = 82 2/7 lbs }

East Pakistan	1965-66	1966-67
1. At Factory gate	2.50	2.50
2. At outstation	2.25	2.25
West Pakistan		
1. Standard quality at factory gate.	2.25	2.00
2. Standard quality at outstation	2.00	1.75

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3. Inferior quality at factory gate	1.75 to 2.00	1.50 to 1.75
4. Inferior quality at outstation	1.50 to 1.75	1.25 to 1.50

Incentive for Production

Past trend indicates a rise in the index of production of food crops by 12.1 per cent in the Second Five Year Plan period ending 1964-65 over that of the First Five Year Plan ending 1959-60. The projected production in the Third Five Year Plan envisages to make the country self-sufficient in foodgrains. The proeuction of rice is proposed to be increased by 27 per cent, that of wheat by 31 per cent, of maize 56 per cent and of other foodgrains by 4 per cent by the end of 1969-70 over the bench mark production in 1964-65. On an average, the production of all foodgrains is proposed to be increased by 28 per cent from 16,800 to 21,465 thousand tons by 1970.

The production of rice, wheat, maize and other foodgrains in 1966-67 is estimated as follows.

Foodgrains	Production (in '000' tons)
Rice	16,676
Wheat	4,121
Maize	800
Others	800

Vigorous efforts are being made to increase the overall production of foodgrains and it is expected that considerable improvement will take place particularly due to the introduction of Mexi-Pak wheat, irri rice and hybrid maize which are high yielding varieties. All the efforts are directed towards making the country self-sufficient in foodgrains by 1970 and improve the position further by 1975, so as to enable the country to become an exporter of foodgrains.

The factors contributing to the improvement in food production in particular are increase in area under foodgrains, increased use of high yielding varieties, more use of chemical fertilizers, improvement in plant protection measures, employment of better cultivation methods and the grant of more credit facilities. The position in respect of these factors is explained below.

The total area under various food crops increased from 42,611,000 acres (average for 1955-56 to 1959-60) to 45,445,000 acres (average for 1960-61 to 1964-65).

Better seeds are being developed and supplied to the farmers at no-profit-no-loss basis through the Agricultural /

Development Corporation. Government imported during 1965-66, about 350 tons of Mexican dawrf wheat seed to multiply for wider distribution. Larger quantities of the seed of Mexican variety are being imported for the coming wheat season. This is a high yielding variety and is expected to increase wheat production considerably. Already 250,000 acres in West Pakistan have been brought under these variety in 1966-67. The target for the cultivation of the variety is 2 million acres in 1967-68, 3 million acres in 1968-69 and 4 million acres by 1969-70. Similarly, high yielding varieties of rice (IRRI) evolved at the International Institute, Philippines, had been procured by Government for experimentation and multiplication on large scale both in East and West Pakistan. These varieties are reported to give more than double the yield at present being obtained by local varieties.

Large quantities of fertilizers are being supplied to the farmers at concessional rates (35 per cent in West Pakistan and 50 per cent in East Pakistan) for encouraging their application and boosting up the production. The utilisation of fertilizers in terms of Ammonium Sulphate in West Pakistan is scheduled to be one million tons in 1966-67, 1.3 million tons in 1967-68, 1.8 million tons in 1968-69 and 2.1 million tons by 1969-70. As regards East Pakistan, the utilization is scheduled to be about 0.26 million tons in 1967-68. To meet these requirements, Government have recently sanctioned fertilizer production capacity of 1.87 million tons per annum. This will be in addition to the existing capacity of 0.48 million tons. Till such time as local production is available to farmers in full, necessary imports are being arranged to meet the requirements to the extent possible.

Plant protection services had been provided to the farmers free of cost but since 1965-66 such services are being made available at 25 per cent cost in West Pakistan, while in East Pakistan these are still being given free of cost. It is planned to cover at least 26 million acres of cropped area with plant protection measures by 1970 against 9.8 million acres covered during 1964-65.

Mechanization has to play an increasingly important role in the development of agriculture. Particularly emphasis on mechanization has been placed since 1959 and at present there are about 10,000 tractors in commission in West Pakistan alone. In East Pakistan, heavy traction has not been considered to be practicable and special efforts are being made for providing power tillers. Out of the 10,000 tractors in West Pakistan, about 3,000 are of light type (upto 35 H.P.), 3,000 of medium type (36-45 H.P) and about 4,000 of heavy type (45 H.P. and up).

A recent survey carried by the Department of Marketing Intelligence and Agricultural Statistics has indicated that the present requirements of tractors (even if high land [illegible] are to be

mechanised) are 45,000 thereby leaving a deficit of about 35,000 tractors.

During 1960-65 an area of 410 thousand acres was covered under mechanized cultivation; the target for 1965-70 is 1,115 thousand acres representing an increase of 172 per cent. Requirements of wheel type tractors by private individuals will be met increasingly. An assembly plant has been set up that will be completely converted eventually to domestic manufacture During the quinquennium, workshop and repair facilities will be extended upto district level to improve efficiency.

An important measure which the Government is taking relates to the increased water supply to the crops. In East Pakistan, the major source of irrigation water will be low lift pumps. The programme is to increase the area irrigated from 200 thousand acres in 1964-65 to 750 thousand acres by 1969-70. In West Pakistan, tubewells will play an increasingly important role. It is expected that 40,000 tubewells will be installed by 1969-70. The irrigation and drainage projects are expected to improve 2.7 million acres and 8.3 million acres respectively in West Pakistan during 1965-70.

Role of Food Production Resources in Stimulating Agriculture in Pakistan.

The main purpose to which production resources are being directed are to increase the real income of the farmers to move towards self-sufficiency in food requirements to the extent compatible with the other needs of the economy, including foreign trade, aiming at the same time at improved nutritional standards in food consumption; and to promote agricultural development on a sound self-propelling basis by further improvement in agricultural organizations and by intensified programmes such as for the development of marketing, cooperatives, storage, credit, educational and other institutional facilities.

In general, however, the overall strategy emphasizes the

necessity for creating economic climate in rural areas which will call forth maximum initiative from farmers as individuals and as a group. In this regard, promotional subsidy will continue to play a key role specially with regard to fertilizer, water, plant protection, improved seeds and the use of machinery. Another aspect of incentive for farmers will be limited price support and stabiliza-tion operations. Support price mechanism will be used to a limited extent to bring about the rapid increase of particular crops to meet special needs and demands of the economy. It is also felt that there is good scope for increasing prices received by farmers through better marketing facilities and improved credit arrangements and these programmes will be strengthened.

The food production resources covered by this study include use of better seed, increasing use of chemical fertilizers, more supply of water and use of machinery.

The seeds, fertilizers, water and machinery resources play a very important role in improving the yield per acre and thus increasing the income of the farmers and raising their standard of living. The experiments carried out in respect of rice, wheat and maize have indicated that under optimum conditions and with the application of proper dozes of fertilizer, irrigation, improved cultural practices, proper control of pests and diseases and use of improved seeds, the yield of these crops can be doubled to make the country self-sufficient in its requirements of foodgrains.

OFF-FARM INPUTS

Transport facilities are a necessity to achieve the economic goals. Efforts are being made to expand these facilities. At present, there are 11,000 miles of metalled roads in West Pakistan and 2,400 miles in East Pakistan. This does not include roads communicating farms, villages, village markets, etc. The system of basic democracy has in the past been instrumental in the construction of village

roads and similar actions are proposed to be taken in the present Plan.

The total number of commercial motor vehicles is at present 52,000 which is proposed to be increased by 32,000 by 1970.

The inland water transport which is the mainstay of transport system in East Pakistan had been provided by independent units. Since 1958, however, the East Pakistan Inland Water Transport Authority has been established to provide essential services and regulate traffic.

Development of railway transport is also envisaged in the present Plan. At present, a number of agricultural commodities are allowed concessional rates of transport. Refrigerated space as well as ice-cool vans have also been provided in certain sections for the transport of perishables.

Agricultural Development Corporations have been established in the two wings of the country for providing the required inputs and other assistance to the farmers as best as possible and the distribution of fertilizers and improved seeds is being done by the respective Agricultural Development Corporations of East and West Pakistan.

With the increased tempo of agricultural development activities, the need for agricultural credit has been steadily increasing. Agricultural credit is provided by the Government in the form of Taccavi loans. During 1960-65, approximately Rs 105 million were distributed as Taccavi loans. For 1965-70, Rs 40 million have been allocated to West Pakistan and Rs 80 million to East Pakistan to be used as Taccavi loans. The Government of Pakistan has established Agricultural Development Bank for providing short, medium and long term credit which are meant for seasonal requirements as well as for development purposes. The total amount of credit advanced by the Bank during 1960-65 amounted to Rs400 million. It is expected that the Bank will advance a larger sum during the Third Plan period.

The third source of institutional credit is the "Cooperatives". There are 26 thousand agricultural cooperative societies with a membership of over 2 million. The loans advanced by these societies in both the provinces during 1963-64 and 1964-65 were Rs 9.82 crore and Rs 8.80 crore respectively. Government has assumed responsibility for providing a total capital of Rs 22 crores for cooperatives during the Third Plan period.

The land tenure system in the country had created a chain of land interests and the actual tiller of land had been the worst sufferer. The laws of inheritance and fragmentation of holdings further added to the economic instability and very low standard of living of the farmer.

It was in 1950 that the East Bengal Estate Acquisition and Tenancy Act was introduced with a series of radical measures in land ownership and tenure system. It abolished zamindara (land ownership) system and fixed a ceiling of 33 acres per head. Restrictions were also placed on sub-letting. Some measures were also taken in West Pakistan. For example, the Sind Tenancy Act 1950 abolished non-statutory charges and conferred permanent rights to the cultivators. The Punjab Tenancy Act intended to abolish the various cess and illegal exactions. An amendment to this Act made in 1952 fixed the share of landlord at 40 per cent and fixed the limit for personal cultivation to 50 acres in irrigated areas.

The most radical reforms were introduced in West Pakistan in January 1959 by the present regime under an Ordinance. The salient features of the land reforms are given below -

(i) No person will own or possess more than 500 acres of irrigated or 1,000 acres of unirrigated land. Excess lands will be resumed by the Government for distribution to tenants and other deserving claimants.

(ii) Compensation should be paid to landlords in the form of interest-bearing bonds redeemable in 25 years.

(iii) Occupancy tenants would be given full ownership.

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(iv) Jagirs/land awards given by Mogul Emperors and others would be abolished without any compensation.

(v) Fragmentation of land beyond a certain minimum would be prevented and joint management of such holdings facilitated.

(vi) Tenants will have security of tenure. In case of ejectment, fair compensation will be given. Embargo will be placed on the enhancement of rents. Illegal exactions in the shape of fees or free labour or services from tenants will be eliminated.

Apart from price policies, price incentives and other measures taken to boost up production, steps have also been taken in the research and education field by establishing agricultural universities and agricultural research laboratories in each wing of the country where basic research work is undertaken relating to the multifarious agricultural problems of the country.

In the field of marketing, certain products, such as wool, goat hair, skins (pickled), coriander seed and sann-hemp are compulsorily graded and marked under the agricultural produce (grading and marking) Act, 1937, before these commodities can be exported. Such a measure has improved the quality of the product packed for export and tended to improve its assembling and returns to the primary growers. It will ultimately improve the production both qualitatively and quantitatively because better quality products marked with superior grade designation mark fetch a better price. In the internal field of agricultural marketing, about 125 regulated markets have been established in West Pakistan where the number is proposed to be increased to 200 by 1969-70. In these markets, the interest of growers is watched so that unnecessary charges are not extracted from them by the merchants community and other malpractices are avoided to enable the growers realise a better price. Fourteen such regulated markets have also been established in East Pakistan under the East Pakistan Regulated Markets Act 1964 and measures are being taken to extend the scope of this Act to further areas.

With a view to keep the producers and consumers abreast with

the market prices, the Government, both Central and provincial, maintains price statistics of agricultural commodities prevailing in all the important markets of East and West Pakistan. The prices are published in the newspapers and broadcast from Karachi, Lahore, Hyderabad, Quetta, Dacca, Rajshahi and Chittagong.

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PAPER ON PROMOTION OF INTER-REGIONAL TRADE IN AGRICULTURAL COMMODITIES AND OFF-FARM INPUTS PRESENTED TO THE CENTO CONFERENCE ON NATIONAL AND REGIONAL AGRICULTURAL DEVELOPMENT POLICY ISTANBUL - SEPTEMBER 10-16, 1967.

BY

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A significant development of the post-war era was the profound change in the economic, political and social outlook of the nations in the world. There grew an awareness of the vital need for devising regional mechanism to ensure better coordination of economic and social policies.

The rapidly changing pattern of economic life, spread of technological innovations and improvements in transport and communications have been accepted as a powerful force in contributing to the growth of regional economic groups.

A meeting of the U.N. Conference on Trade and Development held in Geneva in 1964 expressed in its final Act the importance of economic, industrial and agricultural cooperation between different nations on a regional basis.

Regional planning should result in making the economies of the participating countries more complimentary to one another than they are at present. This regional cooperation has to satisfy certain basic conditions. Cooperation in the field of production should promote balanced development of each country. Some form of a preferential treatment is also implicit in this regional cooperation. Care has, however, to be taken that such preference does not adversely affect the over-all terms of trade of the participating countries. Otherwise, the advantages of the expansion of exports may be more than offset by the disadvantages of the adverse movement in terms of trade.

At present the scope for intra-regional trade is rather limited. It should be one of the tasks of planning to identify the possibilities of widening this scope in the future.

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This requires a detailed study of the development plans of the participating countries to find out the future import requirements of each. This may be followed by an examination of the possibilities of the production of some of these goods within this region.

The exports of the participating countries can be increased in two ways; namely, by changes in the direction of trade and by planned increase in production of certain goods in each country specially to meet the requirements of other participating countries.

At present the volume of trade between Iran, Turkey and Pakistan is limited (Annexures I and II). In order to finance the purchase of foreign investment goods, these countries are in need of hard currency which necessarily sets the direction of exports towards industrial countries.

For the time being, until the development plans of Iran, Turkey and Pakistan are fully adjusted to a greater cooperation, a study may be made on the exchange of surplus goods between the countries of which alternative costs are small . separate study will be needed for the expansion of this trade between the U.K. and other countries of the region.

Production and export of common products.

Excluding oil in Iran and jute in Pakistan, the main agricultural commodities produced in Iran, Turkey and Pakistan are cotton, cotton seed, wool, hides and skins, tea, fresh and dried fruits, which make up a large part of total agricultural production as well as exports. Most of them are exported in raw or semi-finished form. The amount of manufacturing based on agricultural produce is increasing and makes up a large part of the total exports of manufactured products.

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The table below shows the production and exports of some of these common primary products. These figures were compiled by a CENTO experts group and relate to the year 1957. Since more recent figures for Iran and Turkey are not available, comparative figures for Pakistan have also been shown for 1957 (and not latest figures) for the sake of comparison. In view of the increasing local demand, such exportable surpluses are decreasing.

Commodity	Production (000 tons)			Exports (000 tons)		
	Turkey	Iran	Pakistan	Turkey	Iran	Pakistan
Cotton	135	83	313	61	44	115
Cotton seed	270	167	609	300*	437*	149*
Tea	2.5	7	9	N.A.	8.6≠	4.5
Dried fruits	134	220	82	93	91	N.A.
Wool	N.A.	N.A.	16	N.A.	N.A.	17
Hides & Skins (000 pieces)	7,574	9,500	25,900	2.0	9.5	10,225

*Total tons, not in thousand.

≠A large amount is imported for blending.

During the 1957 marketing year more than 623,000 tons of the common commodities were exported from these three countries. Of the total, Turkey exported nearly 324,000, Iran 171,000 and Pakistan 128,000 tons. This does not include wool for which data are not available for Turkey and Iran. The countries of destination for most of each of these commodities are given below.

Destination	Cotton (tons)	Dried Fruits (tons)	Hides & skins (tons)	Barley (tons)	Tea (tons)	Cottonseed (tons)
1	2	3	4	5	6	7
Germany	14,519	46,356	3,750	133,164	291	-
U.K.	21,326	35,206	1,873	3,150	24,751	120
France	46,363	8,318	23	-	-	-
Japan	44,371	565	145	-	-	437
Italy	25,465	9,158	3,196	6,000	15	-

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1	2	3	4	5	6	7
U.S.S.R.	5,o5o	17,965	1,262		-	-
U.S..	2,25o	13,684	7,643	-	-	-
Netherlands	9oo	1o,ooo	733	3,oo5	1,o33	-
Czechoslova-kia	5,832	5,873	111	-	-	3oo
Oman	-	12,o97	-	-	-	-
India	2,o41	7,678	983	-	-	-
Hongkong	7,728	-	-	-	-	-
China	7,343	-	-	-	-	-
Iraq	-	6,673	-	-	-	-
Sweden	952	2o4	1,855	-	-	-
Others	1o,382	17,224	4,571	32,835	5,8o4	29
Total:	194,522	191,o51	26,185	178,154	31,894	886

(These data are not entirely comparable with the export data given in the earlier table. Some date were given on a calender year and others on a marketing year beginning about September. Also the data for barley and cotton seed are for 1956)

A table has been appended in the end (Annexure III) which gives the latest figures of exports of some of the important agricultural commodities from Pakistan (These may be compared from the exports from Iran and Turkey, if they are made available by the countries concerned.)

In the present day economic groupings like those of European Common Market, Eurpean Free Trade Association, Organization of American States, the African Common Market, the Arab Common Market, CAMECON, etc., the countries not having the benefits of such groupings are facing difficulties in expansion of their trade, due to low bargaining power. It is, therefore, of importance that Turkey, Iran and Pakistan which are bound by ancient historical ties and have common future outlook and are at nearly the same stage of economic development, may look into

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the possibility of establishing a common market. For this purpose, it is suggested that an expert group may be constituted to go into the details of exports of common agricultural products. It may study the importance of these countries in total world trade, the direction of trade, trade terms with countries having regional groupings, possibility of diversification of the present trade and its effect on the import requirements, etc.

With the technological developments in the world, it is of equal importance that the trade should be based on firm quality descriptions. In Pakistan, the Government has undertaken the certification of quality under the Agricultural Produce (Grading and Marking) Act and has at present introduced quality control and grading of wool, animal hair, coriander seed, sann hemp, hides and skins and pickled skins. Similar grading schemes are shortly to be introduced in respect of fish, oil-cakes, citrus fruit, bones, casings, tobacco, eggs and potatoes.

For undertaking this work on regional basis, it will be necessary tt formulate common standards. This shall require research on quality. The test houses at Karachi, Chittagong and Khulna of the Department of Marketing Intelligence and Agricultural Statistics of the Ministry of Agriculture & Works which are undertaking the quality control work, can assist in the formulation of these common standards if any such scheme is approved by the CENTO.

ANNEXURE - 1

PAKISTAN - IRAN TRADE

EXPORTS FROM PAKISTAN

(Value in '000' Rs.)

Commodities	1959-60	1960-61	1961-62	1962-63	1963-64	1964-65
Jute raw.	-	-	55	36	559	1,923
Jute Manufactures	8,948	1,169	1,959	556	3,752	4,746
Hides raw.	1,184	242	520	185	528	376
Skins raw.	-	-	-	7	-	-
Wool raw.	166	-	-	-	-	-
Fish & Fish products	-	6	-	7	-	1
Ginger.	-	-	-	-	6	-
Boots & Shoes.	2	-	20	4	-	-
Leather.	-	25	4	-	113	-
Turmeric	-	-	-	-	3,238	2,179
Rice	-	-	734	14,292	57	-
Fruits & Vegetables	-	1	62	60	29	6
Glass Sheets	-	-	-	-	65	-
Surgical inst.	7	14	13	28	116	196
Musical Inst.	-	-	-	1	8	4
Sports Goods.	143	62	175	169	105	134
Machinery.	379	151	1,265	101	74	586
Carpets and Rugs.	-	7	2	1	2	23
Cotton Thread.	-	24	190	93	2	225
Cotton piecegoods.	-	-	12	-	-	30
Cutlery & Hardware.	-	12	-	9	75	17
Linseed Oil.	-	-	-	-	15	1
Seeds.	-	2	-	-	164	-
Electric Fans	-	-	72	104	22	40
Paper(Newsprint).	-	-	1,848	680	141	147
Agarbatti.	-	-	1	- -	-	-
Tyre & Tubes	-	-	-	-	152	225
Drugs & Medicines	8	496	6	35	21	22
Other Articles.	1,615	1,087	1,410	1,350	488	1,235
Total:-	12,452	3,298	8,348	17,718	9,732	12,122

IMPORTS INTO PAKISTAN

Drugs & Medicines	444	302	33	25	10	2
Spices.	8,302	8,301	7,698	3,559	3,806	2,820
Mineral oil.	138,421	141,650	102,595	132,114	155,592	55,132
Vehicles.	904	-	701	-	89	6
Asphalt.	205	1,190	-	1,133	1,959	1,083
Seeds(flower).	833	168	575	485	601	384
Fruits.	-	-	1,757	1,974	4,165	5,744
Fish & Fish products	-	-	-	309	129	116
Gums & Resins	-	-	-	277	247	747
Other Articles.	2,024	426	1,781	1,017	1,181	835
Total:-	151,133	152,037	115,140	140,893	167,779	66,899
BALANCE:-(-)	138,681(-)148739		(-)106792	(-)123175	(-)158047	(-)54777

Source:- Central Statistical Office.

ANNEXURE -I (Contd-2)

PAKISTAN - IRAN TRADE

1965-66

(Value in '000' Rs.)

Exports from Pakistan		Imports into Pakistan	
Tamarind and other spices.	3048	Fish salted dried or smoked.	262
Hides and Skins.	547	Almonds.	3049
Drugs and Medicines.	49	Pistachio nuts.	222
Tyres and Tubes.	56	Cinnamon.	284
Paper & paste board.	174	Cumin Seeds.	3734
Jute Manufactures	6524	Safron.	180
Hand Tools.	114	Wool n.e.s.	512
Cutlery.	74	Natural Asphalt & bitumens.	160
Machinery n.e.s.	885	Other natural gums ne.s.	394
Spectacle frames.	41	Flower, Plants seeds Flowers n.e.s.	726
Surgical instruments	239	Aviation motor fuel.	6343
Printed matter.	69	Motor spirit gasoline.	506
Sports Goods.	134	Motor spirit & other light oils.	982
Stationery.	86	Kerosine oil.	3740
Cotton piece Goods.	27	Jet fuel.	134
Motor cars	27	Illuminating mineral oil.	152
		High Speed diesel oil.	754
Total:-	13,637	Furnace oil.	2231
		Batching oil.	2395
		Lubricating oil n.e.s.	591
		Bitumin.	100
		Soyabean oil.	110
		Glass fibre & glass tools.	439
		Other Articles.	883
		Total:	28,883

IMPORTS	28,883
EXPORTS	13,637
BALANCE (-)	15,246

ANNEXURE I (Contd-3)

Statement showing exports from Pakistan over land route during 1964-65 and 1965-66.

(Value in Rupees)

Name of commodity exported.	1964-65	1965-66
Hession Cloth.	3,309,634	4,279,892
Gunny Bags.	1,475,786	1,650,512
Jute Twine.	168,952	577,286
Turmeric.	1,919,502	2,767,290
Cow & Buffalow Hides.	417,764	523,654
News Print and paper.	130,603	110,478
Holy Quran.	51,285	47,974
Surgical Instruments.	34,307	51,315
Sports Goods.	20,581	37,370
Turanjabeen.	8,372	-
Knives.	7,395	6,436
Chilgoza.	4,877	18,562
Gugal.	6,273	857
Sna leaves.	1,293	1,810
Amaltas.	6,380	8,584
Fountain Pen.	4,509	-
Electrical Goods.	3,605	-
Musical Instruments.	740	-
Cutlery.	1,181	-
Khaloogen.	825	-
Chaskoo.	2,402	-
Lusin Seeds. Onion Seeds.	1,598) 1,285)	7,434
Clusb.	123	-
Dried Lemons.	-	18,694
Dry resin.	-	1,645
Bananas.	-	4,014
Shamianas.	-	3,000
Total:-	7,578,219	10,116,807

Statement showing imports into Pakistan over land route during 1964-65 and 1965-66.

(Value in Rupees)

Name of Commodity imported.	1964-65	1965-66
Zeera White.	2,798,435	4,344,085
Gum.	779,491	441,995
Almond Katha.	2,358,054	1,366,177
Almond Seeds.	2,189,484	1,811,215
Car Tyres.	1,290	-
Pistachio.	1,133,231	232,484
Carpets.	182,395	104,782
Mazoo.	86,525	94,038
Zafaran.	117,884	168,438
Salib Dana.	43,510	50,360
Shakartagar.	1,048	7,977
Holy Books.	5,710	2,425
Gunjida.	3,893	5,029
Tadri.	1,643	1,346
Gulzoofa.	13,668	-
Gauzaban.	36,843	476,829
Kadoo Seeds.	3,762	15,866
Suranjan.	11,058	15,807
Water Melon.	16	-
Ostauddus.	450	720
Zaqoocha	1,530	-
Poonas.	2,164	-
Dhania.	562	-
Appricots Seeds.	2,905	-
Zarukh.	3,248	-
Khak Sheer.	3,912	-
Mehlab	2,520	6,626
Bahmia White.	1,352	-
Franjimeshk.	-	3,649
Pendana.	-	29,607
Ajwoin.	-	52,021
Saleb Punja.	-	830
Kishmish.	-	1,344
Dry raisin.	-	8,350
Seeds.	-	5,077
Gum Zadoo	-	10,760
Pusto Barron Pista.	-	2,046
Dry Rose.	58,475	99,129
Kharakh.	-	570
Gulzafar.	-	7,969
Nakhonak	-	286
Turaniabeen	-	2,086
Mustagi.	-	610
Gul Aramari	-	1,236
Majithi.	-	1,901
Zareshk Dandar.	-	391
Total :	9,845,056	9,364,071

ANNEXURE II

PAKISTAN - TURKEY TRADE

(Value in '000' Rs.)

EXPORTS FROM PAKISTAN

Commodities	1959-60	1960-61	1961-62	1962-63	1963-64	1964-65
Hides raw.	2	-	-	-	-	-
Rice.	-	-	2	-	1	-
Jute	-	-	-	1,185	425	724
Jute Manufactures.	903	1,322	187	638	2,186	5,942
Fruits & Vegetables	-	-	-	1	-	-
Surgical instruments.	-	2	-	-	1	12
Musical instruments.	-	2	-	-	-	-
Instruments. n.e.s.	144	10	-	-	-	-
Stationery.	49	-	-	-	-	-
Rubber manf.	20	13	-	-	-	-
Perfumery(Hena Powder).	20	13	-	-	1	-
Machinery.	-	11	2	-	18	28
Cutlery Hardware.	-	4	-	-	-	-
Electric Fans.	-	6	-	-	-	-
Bicycle	-	-	-	-	23	20
Fountain Pen.	-	-	-	-	146	-
Pencils.	-	-	-	-	45	-
Handicrafts n.e.s.	-	-	-	-	4	-
Harricane Lantern.	-	-	-	-	10	-
Pressure lamps.	-	-	-	-	45	36
Other Articles.	149	14	100	157	15	70
Total:	1,287	1,397	291	1,981	2,920	6,835

IMPORTS INTO PAKISTAN.

Chemicals & Drugs.	-		-	35	64	-
Paper.	-	79	2	-	-	-
Cordage and Cable.	-	-	10	-	-	-
Iron & Steel.	-	-	62	-	-	-
Vehicles.	-	-	-	14	-	-
Hand Tools and complints.	-	-	83	-	-	-
Glassware.	-	-	-	15	-	-
Other Articles.	[illegible]	9	1	20	892	142
Total:	8	88	158	84	956	142

BALANCE :- (+)1,279 (+)1,309 (+) 133 (+)1,897 (+)1,964 (+)6,693

Source: Central Statistical Office.

PAKISTAN - TURKEY TRADE 1965-66 ANNEXURE II (Contd.)

(Value in '000' Rs.)

Exports from Pakistan.			Imports into Pakistan.	
Cow hides.	216		Dying and tanning extracts	81
Raw Jute.	718		Drugs and medicines.	78
Heina Leaves and powder.	49		Building material of asbesto cement.	122
Plant seeds & flowers.	32		Pig iron.	131
Jute twist & Yarn.	68	Jute Manufactures 14988	Special purpose lorries.	40
Jute cloth.	12,598		Musical instrument.	209
Cordage cables & ropes of jute.	110		Manufactured Articles.	31
Jute gunny bags.	2,212		Other Articles.	52
Lamps and Lanterns.	53			
Medical instruments.	89		Total:	744
Fountain Pens.	18			
Other Articles.	132			
Total:	16,290			

EXPORTS:	16,290
IMPORTS:	744
BALANCE (+)	: 15,446

ANNEXURE III.

EXPORTS OF PRINCIPAL AGRICULTURAL COMMODITIES

(Value in '000' Rs.)

Item	Unit of quantity	Year 1965-66		1966-67 (July-March)	
		Quantity	Value	Quantity	Value
Jute	tons	751,376	863,211	459,675	684,982
Cotton	tons	117,310	278,425	72,163	176,493
Wool	000 Pounds	23,740	60,403	9,161	19,008
Hides & Skins	Cwt.	59,338	30,413	15,839	7,087
Fish	Cwt.	400,324	51,582	333,713	56,917
Rice	tons	145,631	132,519	134,285	129,023
Fruits(=fresh, dried and preserved)	-	-	33,353	-	2,934
Tea	-	-	2,081	-	830

PAPER ON MEANS OF INCREASING AGRICULTURAL PRODUCTION PER UNIT AREA PRESENTED TO THE CENTO CONFERENCE ON NATIONAL AND REGIONAL AGRICULTURAL DEVELOPMENT POLICY - ISTANBUL - SEPTEMBER 10 - 16,1967 BY MR. M.Y.MIN QURESHI,S.K.,G.A.R., JOINT SECRETARY TO THE GOVERNMENT OF PAKISTAN, MINISTRY OF AGRICULTURE.

In spite of man's best efforts, agricultural production fluctuates with the smile or frowns of Nature. A change-over from "traditional" agriculture to "scientific " agriculture and to a market economy are almost entirely based on the means of increasing agricultural production per unit area.

Like many Asian countries, the principal problem in Pakistan has been the fast increasing growth of population and the consequential pressure on land. In this country, the present per capita holdings of land are very small and are likely to be further sub-divided as the population increases. While this country has tracts of uncultivated land in West Pakistan, the lack of water makes it extremely difficult to utilise them. Not only that, almost 100,000 acres are going out of cultivation every year due to salinity and water logging. Our efforts to expand water resources and to fight salinity are restricted by available finances. In East Pakistan, very little additional area is available and floods take their toll every year. It must, therefore, be presumed that we have reached a point where expansion of agriculture into new lands is likely to be very small. It is,therefore, necessary to find ways and means of increasing production from the existing land and to guide production into lines where on the one hand will get the maximum returns and on the other to diversify our agriculture to meet the need of our economy, both for internal use and for export.

The pattern of development in Pakistan is on the basis of Five Year Plans. Our success in carrying out the plans strategy were only made possible by interesting the farmers in scientific aids through assurance of economic returns. The return for wheat has been improved by fixing a minimum support price of Rs. 17.0 per maund and by removing control on maximum prices. Similarly, the price of rice at Rs. 31.0 per maund for fine type and Rs. 18.50 and Rs. 19.00 for coarse types have been guaranteed in West Pakistan and for the

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latter type at Rs. 26 to 28 per maund in East Pakistan. In the case of jute, a buffer stock scheme has been introduced under which a government-supported organisation purchases stocks when prices fall below the minimum guaranteed price and sells when prices soar to protect the consumer. A minimum purchase price for jute at the farmer's level has also been fixed at Rs. 26 to Rs. 28/- per maund. Sugarcane prices at which the farmer sells to sugar factories have also been prescribed. The prices of fruits and vegetables have been encouraged by export drive through incentives and by encouraging local processing.

Major Agricultural Policies during the plans.

In First Five Year Plan (1955-60) the paramount importance of agriculture in the development processes of the country was clearly recognised. The plan was directed towards minimising the physical, administrative and technical difficulties. The Plan, however, made the first concerted efforts to identify the correct strategy for agricultural development and planned efforts were initiated; but due to organisational drawbacks much progress could not be achieved during that period.

The Second Five Year Plan (1960-65) projected the following increase in our agricultural production.

1. Foodgrains	-	from 13.2 million tons to 15.9 million tons
2. Cotton	-	from 1.67 million bales to 2.29 million bales.
3. Jute	-	from 6.0 million bales to 7.3 million bales.
4. Sugarcane	-	from 15.4 million tons to 20.8 million tons
5. Tea	-	from 54.3 million tons to 63.8 million "
6. Tobacco	-	from223.0 million lbs.to 254.7 million lbs.

During this plan period, about 1.6 million acres of new land were brought under cultivation. Improved irrigation, drainage and flood protection was provided to another 7 million acres of cultivated land: increased production per acre through the use of 154,000 tons of fertilizer in terms of nutrients; increased plant protection coverage to 12 per cent of the total cropped area; increased use of improved seeds and improved organizational and agronomic practices. Nature too was helpful. Therefore, the measures taken to increase production were effective. The results were

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particularly happy and the country surpassed all planned targets except for jute and tobacco because of certain factors. Government has now introduced other schemes to remedy the situation. These efforts have made our agriculture viable. The growth of agricultural economy during the second plan had been unprecedented. The annual rate of agricultural growth during the First Plan i.e. pre-1960 period was 1.3 per cent against which the growth rate during the second plan rose to 3.4 per cent. Although conspicuous agricultural production was reached, yet we merely touched the fringe of the problem. For instance, fertilizers covered less than 15 per cent of the cropped area, improved seed only 6 per cent, plant protection coverage to only to 12 per cent and improved implements roughly to 10 per cent of the cropped area.

Considering the results from these fractional efforts, the prospects of improvement by increasing the coverage are almost unlimited in their scope and we have provided a larger investment in the agriculture sector in the Third Plan.

The main objectives of the Third Five Year Plan which commenced from 1st July, 1965 are :

1. To increase the real income of the farmer;
2. To bring about an increase in agricultural production;
3. To reduce the pressure of population on land;
4. To achieve self-sufficiency in food requirements to the extent compatible with other needs of the economy, aiming at the same time at improving nutritional standards and,
5. To intensify the development of cooperative farming, marketing and credit facilities.

We are convinced that, in our conditions, agriculture must form the backbone of our economy. Of the total population of 115 million people, 85 per cent still live in rural areas, 66 per cent are still employed in agriculture and 75 per cent are still dependent on agriculture. The contribution of agriculture to G.N.P. stands at 48 % and to foreign exchange earnings at 71.5 per cent. We also realise that investment in agriculture, at a nominal cost in foreign exchange, leads to quicker results and a greater capacity to earn foreign exchange. At the same time, it does not overload the economy with external liabilities, strengthens the internal market for

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industrial development and helps in fighting inflation. For these reasons, the provision for agriculture has been raised from 620 million dollars in the Second Plan to 1392 million dollars in the Third Plan, an increase of about 125 per cent. With the increased investment the targets have been fixed as follows :-

			Increase
Rice	11.40 million tons to	14.44 million tons	27 %
Wheat	4.15 million tons to	5.46 million tons	31 %
Minor foodgrains	1.24 million tons to	1.55 million tons	25 %
Sugarcane	20.75 " tons to	28.30 million tons	36 %
Grams & Pulses	1.01 million tons to	1.23 million tons	21.8%
Oilseeds	1.17 million tons to	1.82 million tons	55.6%
Fruits & Vegetables	4.55 million tons to	5.81 million tons	27.7%
Jute	6.20 million bales to	8.00 million bales	29 %
Cotton	2.22 million bales to	3.52 million bales	59 %
Tea	56.00 million lbs. to	73.50 million lbs.	31 %
Tobacco	233.00 million lbs. to	273.00 million lbs.	17 %

AGRICULTURAL PRODUCTION DURING THIRD FIVE YEAR PLAN PERIOD (1965-1970).

a) Progress made during the first 2 years of Third Plan:

The achievements during 1965-66 show that the growth of agricultural production was only about 1.6 per cent, which is even less than that was achieved in the preceding year. This decline in agricultural production was due to vagaries of nature. The production of rice and other foodgrains in East Pakistan showed a negligible increase of 0.4 per cent during 1965-66. Had there been no cyclones, tidal bores, the production would have been higher. The production of sugarcane, jute and cotton went up by 21, 19 and 10 per cent respectively as compared to the preceding years. Production in tea declined by 5 per cent. It was realised by the Government that there were special circumstances such as droughts, floods, cyclones and war, responsible for this retarded growth. It was realised that determined efforts are necessary to achieve the Third Plan targets which otherwise would be seriously jeopardized. The government, therefore, took a number of measures for improving the agricultural performances.

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(i) Agricultural Policy Committee.

As a first important step the government set up in May, 1966, two high powered Agricultural Policy Committees to lay down, each year, the overall production targets for important agricultural crops in each province, break these down for each division and district, and review and introduce policies, programmes and measures to achieve them. Each of the Committees has also a standing sub-committee of experts for the purpose of preparing study for the agricultural policy committee and to follow up its decision.

(ii) Fertilizers.

Review of various programmes for the use of important agricultural inputs revealed that the performance during the year 1965-66 had not been encouraging. For example, the use of fertilizer during 1965-66 was only 136 thousand tons of nutrients (against the plan target of 205 thousand tons). It was at about the same level as that attained during 1964-65. This stagnation was found to be due to several factors : delays in streamlining the distribution system, shortage of credit, lack of an effective educational campaign, and lack of foreign exchange to import the necessary quantities of fertilizers. Government took a number of remedial measures during 1966-67 with the result that over 100 thousand tons of nutrients have been distributed during the first 6 months of the current year. If the monthly pattern of distribution, experienced during the previous year, is assumed there is a likelihood that plan targets of distributing 255 thousand tons of nutrients, would nearly be achieved.

(iii) Water :

In East Pakistan there are immense possibilities for increasing agricultural production through the use of low lift pumps for irrigation of land during winter season and early spring. The number of such pumps in use in 1964-65 was 2238 which irrigated an area of 131,000 acres. The number of pumps increased to 3420 and the area irrigated to 175,000 acres in 1965-66. No power pumps have been added so far during the current year to the existing ones because of the scarcity of foreign exchange. Lately, the Government has decided to finance the import of 3000 such pumps.

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In view of the benefits of irrigation, small fractional pumps of less than 1 cusec capacity are in demand by the cultivators. To meet this demand, the Government has recently ear-marked 2.5 million rupees in foreign exchange for import of such pumps. The programme of increasing agricultural production through other irrigation, drainage, flood control and embankment schemes has not progressed satisfactorily. Efforts are being made to improve their working.

Installation of private tubewells in West Pakistan has progressed satisfactorily. The number of tubewells installed during 1964-65 was about 2000. To obtain still better results in augmenting water supplies through private tubewells, the Agriculture Policy Committee decided in 1966 that all facilities should be provided to meet the demand of the public in the installation of private tubewells. The standing sub-committee was asked to ensure that all requirements of tubewells were included in imports from abroad. The Committee further directed that high priority be given for encouraging private tubewells and to work out a feasible programme for the purpose.

(iv) Seed.

About 350 tons of Mexican varieties of wheat seed, which is reported to give 33 to 50 per cent increased yield over the local varieties, was imported during 1965-66 and sown on 10,000 acres. Rice varieties imported from the Philippines, have been tried in both the provinces during the year 1966-67. The IRRI variety of rice has given a yield of about 80 maunds per acre. This variety needs very high inputs i.e. water, fertilizer and proper plant protection measures.

(v) Plant Protection.

In 1965-66, only 6.2 million acres were covered under plant protection. It is estimated that this area would be increased to 8.4 million acres during 1966-67. The West Pakistan Government has also decided to recover 25 per cent of the cost of plant protection measures from the farmers. In East Pakistan aerial programme received a set back because four aeroplanes were damaged during the cyclones in 1965.

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(vi)Price policy.

The Third Five Year Plan proposes encouragement of foodgrains production through the price mechanism. In West Pakistan, the policy of forced procurement of wheat at below market prices has been replaced by a support and buffer stock operation. Minimum price has been raised to 17.0 per maund for the year 1966-67. Similarly, the forced procurement of paddy in East Pakistan undertaken in the last year, was abandoned, as it had worked as a discentive for higher output.

From the above review of the government agricultural policies and programmes during the plan period and their impacts on the achievements of targets, the difficulties and shortcomings in implementing the different programmes and projects in the sub-sectors of agriculture are made clear. The experience of difficulties during the past years would help in implementing the future programmes more accurately and realistically. The main objective of increasing agricultural production is by (i) expansion of area under cultivation and (ii) by increasing the number of crops i.e. intensive cultivation.

The average size of cultivated farm is 7.7 acres in West Pakistan and 3.1 acres in East Pakistan.The average size of total holding was 10.1 acres in West Pakistan and 3.5 acres in East Pakistan which means that 56 per cent of the total holding in West Pakistan and 95 per cent in East Pakistan are utilised for cropping purposes. This shows that the expansion of the area under crop in East Pakistan is not possible excepting small area which is under Haor and some culturable land affected by salinity in the coastal belts. Both Haor and saline area in East Pakistan need reclamation. In West Pakistan water logging and salinity is the main problem which involves huge area of culturable land every year. Salinity Control and Reclamation Project had been trying to get rid of this menace through different measures. There is, however, some scope of bringing new area under cultivation in West Pakistan. According to the estimation of the Planning Commission about 24 million acres of new land may be brought under cultivation, of which the maximum area will be in West Pakistan. If best possible efforts are made it may

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be possible to bring about 1 million acres of culturable waste land under cultivation every year during the current plan period. This addition of 1 million acre under cultivation would result in a partial relief to agricultural production situation of the country but it would not be possible to keep pace with the growth of the population and resultant enormous requirements of the country. Again from the past experience it is apparent that bringing of culturable wasteland under cultivation has got many difficulties. Therefore, the possibility to increase agricultural production lies in increasing the yield per unit area.

Means of increasing agricultural production per unit area :

Findings and opinions of different agricultural experts in respect of increasing agricultural production per unit area are more or less common. Their suggestions and recommendations to receive maximum produce from a particular plot of land were practically the same in different ages. The mode of application of their recommendations may vary in different localities but the main principle and philosophy behind it has always remained the same.

The farmers, whom we always term as conservative, are also quite conscious and aware of the ways and means of increasing their farm produce. They generally lack in economic application of different inputs and some modern technical know-how, but they are experts in their own field of primitive cultivation. Their other important weakness is finance, for which they cannot use the most profitable inputs on their own farm, even though they have got clear knowledge about it.

Our problem, therefore, is mostly with the farmers, rather than the farms. The two main problems discussed above namely lack of knowledge and lack of funds of the farmers attract attention for further consideration.

According to some experts expansion of general education among the common farmers should be the prime objective of agricultural development programme. Others, however, differ from this view. They do give importance to the education of the farmers but do not place it as on top priority.

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In our opinion, the availability of all resources should be ensured to be within the easy reach of the farmer timely to enable him to increase his agricultural production per unit area. These facilities are briefly discussed below :

(a) Credit facilities.

The subsistence nature of farming in the country shows the high incidence of low income in the agrarian sector which is one of the counry's chief problems. The majority of the farmers have very limited means. The lack of capital is a very strong reason for a general reluctance to embark on new practices and have a preference for inertia and conservitism. No effort to achieve production is likely to make headway unless the farmer has sufficient funds to procure the physical factors of production namely fertilizers, seeds and machinery, etc. A survey report on use of fertilizer in Pakistan, 1961, shows that about 50 percent of the farmers of East Pakistan could not use fertilizer due to lack of funds. This percentage in West Pakistan was 20. A similar survey has been conducted recently in both East and West Pakistan, the findings of which are that about 75 percent suggestions for popularising fertilizer were in favour of provision of credit facilities. Another survey on "Farm Power Machinery & Equipment in Pakistan" shows that over 57 percent owner-cum-tenant farmers and over 60 percent tenant farmers require credit facilities for procuring improved farm machinery and equipments. The findings of the said reports show the gravity of the situation and call for immediate attention for the provision of increased credit facilities in the agricultural sector.

The budget provision for credit facilities in agriculture sector is not enough. Consideration should also be given to the different factors which concern the easy reach of credit at the door step of the farmer. There are a number of difficulties in supplying credit to the needy farmer. It is even a problem for those who want to receive it. The barriers between supply and receipt of credit facilities need to be examined and a solution should be evolved to minimise the formalities in its operation. Credit facilities may

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be supplied in terms of cash and kind. Cash supply of credit has the main draw-back of being dependent on the discretion of the farmers as to purpose for which he would utilize it. Credit in the form of inputs like fertilizer, seeds, machinery and implements etc., has got its own problems in the actual field of implementation. However, provision of credit facilities in kind may be more fruitful in agricultural development. The first duty of the Governments should be to eliminate the hinderences that may occur during its supply and application to the proper field. It is also necessary to ensure that the credit provided by the Government has been utilised by the farmers for the agricultural purpose to the maximum extent.

(b) Water Supply:

Pakistan's agricultural Census 1960 shows that the intensity of cropping pattern in East Pakistan was 148 percent and that for West Pakistan 120 percent only. The present method of land use in East Pakistan is such that more than ¾th of the cropped acreage is planted during the Kharif season and less than ¼th acreage is planted during Rabi Season. Thus, most of the land remains fallow during the rabi season exclusively due to lack of water supply. East Pakistan receives high amount of precipitation in a year but the distribution is confined during Kharif season. The rabi season is almost dry. Therefore, artificial irrigation is absolutely necessary during the rabi season. The problem of irrigation is thus as acute in East Pakistan as in West Pakistan. The Census shows that only 7 percent of the total cultivated land in East Pakistan is artificially irrigated whereas the percentage in West Pakistan is over 60 percent. By the provision of water supply in East Pakistan, almost all fallow land during rabi season can be brought under crop resulting almost double the present position of crop intensities in East Pakistan.

Other important cultural practices are also inter-dependent on irrigation practices. Application of manure and fertilizer, practicing of green manuring etc., need timely and properly water supply for all crops. A rough analysis places the

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contribution of water supply to the crops during the Second Five Year Plan at 26 per cent of agricultural production. Development of surface water contributed about 13 per cent.

(c) Farm Power.

The main farm power of the farmer for different agricultural operations is bullock. Use of improved machinery, like tractors, is negligible in East Pakistan. Demonstration is, however, given to the farmers by the Agricultural Development Corporation for use of such improvements in farming. The situation in case of West Pakistan is better as mechanization of farming is in progress for past several years. The main reason of this progress in West Pakistan is large-sized and less fragmented holdings and favourable climatic conditions. In contrast, East Pakistan's average farm is extremely fragmented and most of the land remains under water for the longer part of the year during which tractor cultivation is not possible. Even in case of bullock power, the indigenous draught power is very weak for deep ploughing. Studies show that mechanical power cultivation is economical over bullock farming. Mechanical power cultivation is also important from the point of view of intensive cropping which is not possible with bullock power. The efficiency of bullock power is very limited and for intensive cultivation, the time limit is a great factor within which a particular crop is required to be sown. But with bullock power it does not always become possible to get the land prepared within the narrow limit of time. Mechanical operation of land also enables the farmer to take better care of other cultural practices as his labour is saved from the land preparation operations. The fear of some experts about the problem of agricultural unemployment due to the introduction of mechanical power has little justification as mechanised farming would increase the intensity of cropping and create more opportunities for employment. So far as the fragmentation of the holding and climatic conditions of East Pakistan are concerned, small power tillers of 5 to 10 H.P. can conveniently be used and are being popularised. In West Pakistan, medium sized tractors are popular for both land development and cultivation.

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With the growth of mechanisation, farmers will also be interested to maintain milch animals instead of bullocks and the problems of milk and animal manure will be eased.

It is, therefore, suggested that introduction of mechanical farming should be popularised and necessary measures should be taken for its rapid introduction on the rural farms.

(d) Better Seed.

Supply of better seed to the farmers was the first consideration among the "Five Firsts" adopted by the Government of Pakistan. The use of better seeds means growing superior variety of crop plants. Higher yield is the primary objective but the quality of crop and its trueness of type must also be considered. The quality factor is specially and vitally important in respect of jute and cotton. The quality factor is also equally important for other crops like rice, wheat, fruits and vegetables. The crop which is superior in quality is supposed to fetch higher price. Secondly, the better variety of crops are those which have qualities of high yield, resistance to pests and diseases, to salinity, to drought, to water-logging and lodging etc. As most of the crops have to undergo a series of natural calamities the farmer should possess the main objective of selecting the better quality seed. The scope of producing better quality seed at farm level is limited due to restricted means and knowledge of the farmers. It is essential that Government should take necessary steps to produce sufficient quantity of better quality seed of all crops and distribute among the farmers, if possible, on credit basis, specially to those farmers having limited means. Rough estimates show that the contribution of improved seeds towards the achievement of agricultural production during Seond Plan period was about 3 per cent in West Pakistan and 4 per cent in East Pakistan. According to expert opinion and findings of some experiments, the application of improved seed alone can increase per acre yield by about 15 per cent. The Third Plan targets are to cover about 50 per cent rice area in West Pakistan and 21 per cent in East Pakistan with improved seeds by 1970. It is felt that this coverage would not be sufficient during this plan period and should be increased to 50 per cent in

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East Pakistan and 70 per cent in West Pakistan of the total rice area. In case of wheat the coverage should be increased to 6[illegible] per cent. In case of jute and cotton, efforts should be made to ensure the supply of the total required quantities of pure seeds by the Government.

To carry out the above programme, arrangements for the supply of improved seeds should be streamlined and speeded up. A sufficient number of seeds multiplication farms through Government agencies and registered growers should be established. It may also be desirable to set up a chain of Seed Banks throughout the country which can store and supply good quality seeds to the farmers in time at reasonable rates and to full requirements. Subsidy for such improved seeds is also recommended.

(e) Fertilizer :

Recommendation of fertilizer application is the second factor of the 'Five Firsts' of agricultural production. Nitrogen, Phosphorus and Potash are the three major ingredients of the plant nutrients. Continued removal of these constituents from the soil dueto intensive cropping has resulted in deficiency in plant nutrients. The soil should be recouped with fertilizers for proper growth and bett better yield of crops. Unless sufficient quantities of plant nutrients are available to the soil other improved cultural practices and measures would face failure.

Use of fertilizer in Pakistan is a recent practice. Experiments conducted in Pakistan on rice and wheat have shown positive response increasing production by the application of proper fertilizer. According to Dr. Vermat FAO Expert, East Pakistan can raise its output of rice between 7 to 10 million tons with the help of fertilizer alone from the existing acreage. In West Pakistan the data shows that wheat production can be doubled and rice trippled by the application of fertilizer. Total requirements of chemical fertilizer in the country has been estimated at 2.85 million tons having the break down of 1.6 million tons in East Pakistan and 1.8 million tons in West Pakistan. It is estimated that if 1/5th of the total requirements of East Pakistan is made available the total output of rice can

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be increased by 2 million tons annually. Similarly, there is a vast scope of increasing yield of all crop in West Pakistan by enhancing the supply of fertilizer to the farmers.

In implementing the supply programme of chemical fertilizers to the common farmers, easy formulae should be evolved and adopted. The popularisation of fertilizers and their provision to the very large number of farmers at the right time and of the right kind will, require as in the case of seed, a first rate streamlined organization operating in a business like manner. It will also require provision of numerous satisfactory stores within easy reach of the farmers and an energetic extension staff in the field to demonstrate its effectiveness. For the hygroscopic fertilizers like urea, weather proof stores will be needed, specially in humid climates.

Another consideration of fertilizer application should be that there should be a relationship between cropping pattern and fertilizer use. According to the country's requirements of different agricultural products the country may be divided in different geographical zones and fertilizers should be given according to the need of the particular zone.

It is also important that the fertilizer recommendations in different areas should be based on scientific soil surveys.

(f) Technical know-how:

The problem of technical know-how will become more acute with the growth of mechanization and adoptionof improved method of crop farming. Farmers are therefore, required to be trained in better techniques of farming by practical demonstration and through audio-visual aids and other means.

(g) Plant Protection:

Plant diseases and insect pests are of regular occurence in Pakistan. The extent and severity of infestation vary greatly but even at a conservative estimate, it would appear that 10 to 15 per cent of the potential yield of all crops is damaged by pests and disease , even when there is no large scale outbreak. At time of wide-spread infestation, the loss in the affected areas may go over 50 per cent, often resulting in complete crop failure. By .....

adopting efficient plant protection measures, it is possible to prevent or substantially reduce this damage in the field as well as in the stores. Campaigns organised in the past have amply demonstrated that suitable measures taken in time, give increased production.

(h) Market and Marketing :

There is a direct relationship between the agricultural production and its marketing. In other words, production of required agricultural commodities is directly dependent on the prevailing market prices as well as its disposal facilities. Area under a particular crop, to be brought by a farmer, is determined by the price incentive available during that period. Again inter-crop parities influence the farmer for the selection of a particular crop. In a study carried out in 1964 by Pakistan Agriculture Marketing Department on "Influence of Price and Fiscal Policies on Production of Major Crops" it has been revealed that area under rice and jute, the two competing crops, fluctuated directly according to the price structure prevailing in the pre-harvest period. The same situation is also true in case of other competing crops. It has also been observed that the area under jute did not show much increase while the inter-crop price parities between rice and jute had a little variation. Farmers generally do not response to small rise in jute price and devote themselves to rice cultivation because rice can be consumed by themselves if even it does not fetch a good price in the market. It is, therefore, necessary to provide sufficient incentive for a particular agricultural commodity, which is required to be produced in larger quantities like foreign exchange earning crops. The decision in this commercial line should be taken by the Government well ahead of time and any declaration of price incentives for any particular crop should be made in time so that farmers can avail of this opportunity by making necessary adjustment in their business.

Strictly speaking there are no marketing facilities, specially of agricultural commodities, in Pakistan. The prevailing marketing practices are haphazardly carried out and the big gap between the producer and consumer prices persists. Approach to local market by the common farmer is also a problem. Communication system

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is such that farmers cannot easily and quickly bring their produce to big markets for proper prices. The intermediaries in marketing system, specially in case of cash crops, are a problem. Adequate storage facilities are not sufficient for the agricultural produce. This problem becomes acute during the harvesting period, specially of major crops, when the farmer under compulsion has to dispose off his commodities at lower prices. Again the lack of storage facilities for perishable commodities create problem for both consumers and producers. It is generally observed that the pre-harvest and post-harvest prices of perishable agricultural commodities have a large variation. Steep fall of the post harvest prices provide no incentive for the producers. It is, therefore, suggested that marketing system including storage and communication facilities should be developed as quickly as possible. Fixation of minimum prices needs due consideration in relation to the cost of production of a particular crop.

(ii) Education :

Experts suggest that farmers should be given an agricultural education. An agricultural education is, however, very much, important in the long run development of economy. It is rather imperative to extend general education among the common rural population. An awakening due to the extension of general education may be expected among the farmers when they will be free to choose their own profession and be interested to acquire the knowledge and technical know-how of their profession.

(iii) Cropping Pattern:

A scientific cropping pattern should be adopted for the major zones of the country according to the requirements of different crops and farmers should be encouraged, through incentives, to grow the required crops in a particular zone. The cropping pattern should be such that it would give due importance to capital incentive crops. Proper cropping pattern is also very important for increasing the intensity of cropping. In East Pakistan, for example, if a farmer is supplied with power and water, it becomes very easy for him to raise at least 3 main crops from a particular plot of land. It has also been

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observed that a ' catch' crop is grown as a fourth crop from the same plot. Therefore, proper rotation of crops with a good cropping pattern should be encouraged and demonstrated among the common farmers.

(iv) Utilization of men and farm power.

Utilization of man and farm power which is the part of the farm is also very important factor for increasing agricultural production. Utilization of manual labour and animal/mechanical power in the farm should be in such a way that the pattern of crop production and power application become inter-dependent. Deficiency of farm power at the required time adversely affect the land production. Similarly, excessive farm and manual power renders farm production uneconomic

The above considerations influence the per unit production and need further study and research.

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