

PAKISTAN GEOGRAPHICAL REVIEW

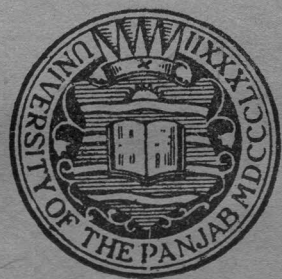
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FOOD SUPPLY AND POPULATION GROWTH IN PAKISTAN

BY

MISS M. K. ELAHI

Food is the most important single item in human subsistence, and man the most important living organism. The problem of food supply for man is as old as man himself. Throughout the historic past man has sought food from the mother earth in various forms and by various methods. He still follows the professions of his ancestors; he is a hunter, a pastoralist and an agriculturist. Like all other problems this too has two sides—a demand side represented by growing population and a supply side represented by the agricultural and allied activities which are the main source of food supply. For a thorough analysis of this problem, the progress of population has to be interpreted in terms of cultivated land and food supply available *per capita* from the existing resources of a country.

Pakistan has inherited an agricultural economy which is a gift of the river gods. The ancient civilizations of historic 'India' grew along the valley of the Indus where the art of agriculture and irrigation was well developed for those times. With the march of time man in our part of the world seems to have made little progress in the agricultural industry which requires a very scientific approach. As the population of our country is growing fast the matter of food supply no more remains a simple affair. Today Pakistan is at the cross-roads of self-sufficiency and precarious food situation. A small untoward happening like floods, failure of rainfall or shortage of water-supply from canals results in food shortage which has to be met by imports.

According to the census of 1911 the population of the country was enumerated to be 51,008,571 which increased to 75,824,000 by 1951. There has been a net increase of 24,815,429 people during the last forty years which amounts to 48 %. The increase has been faster in the western wing where it amounts to 73 %, where as in the eastern wing it has been only 43 %. This differential rate of increase has been mostly on account of heavy losses of population due to famines, floods and unhealthy environments giving a higher death rate in East Pakistan. During each decade the rate of increase of population has been varying. Between 1911-21 the rate of

increase was 6 %, the lowest for any decade mainly due to the unsettled conditions and the epidemics of plague and influenza. The following ten years ending 1931 population increased by 8.5 % when safe and settled life had started along with the expansion of cultivated and irrigated land. During 1931-41 the population increased at the very fast rate of 19%. In West Pakistan the increase was 21% and in East Pakistan 18%. Population increased at a much lower rate during 1941-51 when it registered only an addition of 7.3 percent, 17% in West Pakistan and below one percent in East Pakistan.

Since 1911, population of the country has increased by 48%, 33% in East Pakistan and 73% in West Pakistan. The greatest increase during these years is shown by the canal colony division of Multan. Here the population has been more than doubled since 1911 (Table 1). This large increase of 105% is accounted for by the network of canals, that has resulted in the expansion of agricultural land which proved a great magnet for agriculturists for whom chances of a secure and settled life are not oft-repeated. Bahawalpur division also shows an increase of 70% in its population since 1911. Here too the canals have converted the sandy wastes into productive fields. The old settled division of Lahore also shows a great increase amounting to 67%. Here the increase is partly related to the expansion of agricultural land and the intensive cultivation in the well irrigated areas and partly to the development of large urban centres of Lahore, Gujranwala and Sialkot. Rawalpindi division also shows an increase of more than 50%. All other divisions show an increase of less than 50%. Hyderabad and Khairpur show considerable increases of 42% and 35% respectively, correlated with the canal irrigation after the completion of Sukkur Barrage. Moreover, in these fertile irrigated parts of Lahore, Multan, Bahawalpur and Hyderabad divisions a large number of Mohajirs from India have settled down which has made the upward trend of the population graph all the more conspicuous.

TABLE I

PERCENTAGE VARIATION OF POPULATION IN PAKISTAN

	1911-21	1921-31	1931-41	1941-51	1911-51	1931-51
West Pakistan ..	8.0	12.0	21.0	17.0	73.0	43.0
Peshawar division ..	29.0	-6.0	15.0	8.0	32.0	25.0
D. I. Khan division ..	2.2	0	11.0	8.0	24.0	21.0
Rawalpindi division ..	3.0	12.0	21.0	10.0	55.0	34.0
Lahore ..	7.0	15.0	23.0	12.0	57.0	38.0
Multan ..	17.0	28.0	26.0	38.0	105.0	74.0
Bahawalpur division ..	18.0	13.0	27.0	19.0	70.0	52.0
Khairpur division ..	9.0	19.0	16.0	8.0	35.0	25.0
Hyderabad division ..	8.0	16.0	14.0	16.0	42.0	38.0
Quetta division ..	.3	10.0	7.0	22.2	46.0	35.0
Kalat division ..	-19.0	2.0	-0.1	20.0	-0.8	19.0
Karachi Federal Area ..	37.0	24.0	44.0	158.0	538.0	270.0
East Pakistan ..	5.3	7.0	17.9	0.1	33.0	48.0
Chittagong division ..	7.6	11.9	22.4	3.8	53.0	27.0
Dacca division ..	7.1	8.1	19.8	-2.7	35.0	16.0
Rajshahi division ..	2.1	2.5	12.4	0.6	19.0	15.0
Pakistan ..	6.0	8.5	19.0	7.3	48.0	28.0

Quetta division's population has increased by 46% due to different reasons. No doubt there has been an increase in the land under cultivation but the development of large urban centre and a cantonment guarding the route to Afghanistan through Bolan pass alongwith the attraction of the mining centres has added much to the population—very conspicuous increase being in 1941-51 when it had the highest increase for the decade after Multan division.

Kalat is the only division in West Pakistan that has shown a slight decrease in population since 1911. The population of the Kalat division which includes the Baluchistan states and the adjoining district of Chagai was 592,457 in 1911 and 589,214 in 1951 showing a net loss of 3,243 persons which amounts to 0.8%. The greatest loss to the population of this division has been during the period from 1911 to 1921 when it lost 19% of its people. In later years the population remained almost

static upto 1941. During the decade from 1941-51 the loss was almost restored with a slight deficit as stated above. Such a state of affairs was mostly due to the lack of agricultural land as a result of the rough nature of the country and lack of irrigation facilities in the arid plateau. People mostly follow a nomadic and semi-nomadic life; their herds of sheep being their main economic asset. The conditions have improved a little since 1941 after which the emigration from these areas to the richer parts of the neighbouring divisions had been much slowed down.

In East Pakistan, the total increase in the population since 1911 has been 10,507,554, an addition of $\frac{1}{3}$ of the total population in 1911. The largest increase of 53% is in the Chittagong division where there has been still room for the cultivation to be expanded. The least increase is shown in Rajshahi being 19%. Dacca and division figures record an increase of 35%.

Apart from these divisions, Federal capital area of Karachi is very conspicuous with an increase of 538%. Upto 1941 the rate of increase has not been so great always remaining under 45% but the meteoric rise in the population graph took place in the last ten years from 1941-51 when it showed an increase of 158%. Here the causes of this great increase are entirely different from those in the canal colonies of Multan or Bahawalpur, nor this great increase is due to increased birth rate or reduced death rate but due to the development of a large business and commercial centre at Karachi which has acquired a unique position as the capital of Pakistan. Huge influx of refugees which constitute more than half of the total population of the Federal Capital area has also contributed to this addition of great numbers.

Taking Pakistan as a whole, there is a net increase of about 518,489 people every year. In West Pakistan it is 511,958 and in East Pakistan 6,531 only. The annual rate of increase of population is 0.75%, more than double than that in U. K. where it is only 0.30 percent. The population of U. S. A. is increasing at a faster rate than that of Pakistan, specially so after 1931. (See graph). The percentage increase in U. S. A. since 1911 has been 65%, 17% more than that in Pakistan for the same period. In China the population has been suffering due to the disturbed political conditions and the resultant poor economy alongwith the natural calamities of famines and epidemics; from 1911 to 41 the increase has been very slight. There has been a sudden rise in the population in the decade from 1941-51 when under the new set-up there has been a spasmodic increase of 22% as a result of an all round development in China where the resources of the country are being exploited more fully.

Progress of Agriculture in Pakistan.—Progress of population during the past is only one side of the picture while the other side is represented by the progress of agriculture and other food resources of the country. Distribution of population has

to be interpreted in terms of food supply for the increasing numbers. Progress of agriculture in Pakistan during the past years has been comparatively slow. Taking into account the progress of agriculture since 1931, (detail figures for all Pakistan prior to 1931 are not available) the results are not very encouraging when seen along with the population graph. In 1931 Pakistan had 53,867,000 acres of cultivated land which amounted to 22% of the total area of the country. The latest figures (1953-54) show that the cultivated area now is 60,024,745 acres, which is 26% of the total area, only 4% of the total area of the country has been further brought under cultivation since 1931. The percentage increase, however, over 1931 figures is 12. Taking the two wings separately, East Pakistan has made little progress in this respect. Only 2% increase has been recorded in the cultivated area which was 61% of the total of East Pakistan in 1931. This small increase in East Pakistan is mainly due to the reason that much of the first class land had already been brought under cultivation by 1931 as is shown by the high percentage of cultivated land leaving thereby little room for expansion of agricultural land without great initial expenditures.

In West Pakistan the cultivated acreage has increased by 22% showing a much faster rate than in the East. In the arid west the amount of culturable waste was great which could be turned into rich agricultural land by the aid of artificial irrigation. Prior to 1931, the various irrigation projects in the plains of the Indus and its tributaries had brought thousands of acres under cultivation, and since 1931, 5% of the total area of West Pakistan has been added to the existing land under plough with the aid of irrigation. Even today West Pakistan has only 20% of its total area under cultivation.

The division-wise figures show a great variation in the percentage increase of agricultural land since 1931. Amongst the canal colony areas, Multan division shows the largest expansion of 25% in its cultivated acreage. Bahawalpur division also shows an increase of 18%. These high figures could be accounted for by the development of irrigation systems that made available vast areas of virgin land for agricultural purposes. Bahawalpur division and Hyderabad division also show considerable expansion in the cultivated land due to the similar reasons. In the old settled divisions of Lahore and Rawalpindi the increase has been small as the percentage of cultivated area in 1931 was considerably high being 60 and 50 respectively. Very high percentage increase of 117 has occurred in Quetta division. Actually the percentage of cultivated area in 1931 was quite low mainly because of the hilly nature of the country and the general aridity. Only 2% of its area was cultivated which measured about 520.8 thousand acres. Now it amounts to 5% of the total area, meaning thereby that the cultivated area has more than doubled itself since 1931. It is mostly due to small irrigation projects which have provided water for the small patches of fertile soil in the valleys.

TABLE II
PROGRESS OF CULTIVATED AREA IN PAKISTAN SINCE 1931

	CULTIVATED AREA IN, 000 ACRES		PERCENTAGE OF THE TOTAL AREA		PERCENTAGE INCREASE
	1931	1951	1931	1951	1931
West Pakistan ..	32,611	37,997	15	20	22
Peshawar division ..	2,296	2,710	13	15	18
D. I. Khan division ..	2,656	2,795	19	25	5
Rawalpindi division ..	3,861	4,190	50	53	8
Lahore division ..	3,879	4,002	60	63	5
Multan division ..	5,794	7,178	57	68	25
Bahawalpur division ..	3,776	4,608	13	20	18
Khairpur division ..	3,965	4,312	29	35	7
Hyderabad division ..	5,784	6,899	25	29	19
Quetta division ¹ ..	520	1,129	2	5	117
Kalat division ² ..	80	105	.1	.2	23
Karachi Federal area ..	NA ¹	69	NA	14	..
East Pakistan ..	21,256	22,027	61	63	3
Chittagong division ..	5,029	5,056	47	47	.5
Dacca division ..	7,111	7,790	70	72	9
Rajshahi division ..	9,116	9,181	64	65	.7
All Pakistan ..	53,867	60,024	22	26	12

In East Pakistan all the divisions have shown conspicuously slow progress of agriculture. The only outstanding increase of 9% has been recorded in the Dacca division in spite of the very high percentage of the cultivated land in 1931 leaving little room for expansion. The response of the soil is greatest here on account of the high soil fertility.

The potentially cultivable land is available in both the wings of the country. About 13% of the total area of Pakistan is classed as culturable waste, being 12% in East Pakistan and 14% in West Pakistan which could be brought under cultivation with the requisite provisions of irrigation or drainage.

1. N. A. Not available.

2. Figures relate to 1948-49.

A comparison of the progress of population and agriculture since 1931 shows that the advance of the cultivated land has not kept pace with the increase in the number of people. Population has increased by 43% since 1931 and the cultivated area, as has been stated, shows an expansion of only 12% during the same period. Merely a comparison of the percentages does not give a true picture unless the densities of population per unit area may be taken into account.

For all Pakistan the average density of population per square mile is 208. The disparity between the two wings of the country is very conspicuous as East Pakistan represents one of the most thickly populated parts of the world with an average density of 777 persons per square mile. West Pakistan is much sparsely populated with an average density of 108 persons per square mile. The thickly populated parts of West Pakistan include Lahore, Multan and Rawalpindi divisions where densities per square mile are 585, 415 and 327 respectively. The highest density among districts (excluding the federated capital area) is that of Lahore where it is 780 persons per square mile. Peshawar and Mardan districts with plentiful of rich agricultural land also show high densities of 583 and 541 persons per square mile respectively. In contrast to these relatively thickly populated parts of West Pakistan, the dry hilly areas of Kalat and Quetta divisions show very low densities of 5 and 18 persons per square mile respectively. These divisions show varying densities between 50—150 persons per sq. mile.

In East Pakistan no where except the Chittagong Hill Tracts, the density of population per square mile falls below 500 persons. Chittagong Hill Tracts have large areas which are very sparsely populated with less than 5 persons per square mile. In contrast to Chittagong Hill Tracts, Tippera, Noakhali, Dacca and Faridpur are thickly populated with densities of 1,500, 1,424, 1,492 and 1,052 persons per sq. mile respectively.

This picture of the general distribution of population over the entire area of Pakistan radically changes when population is distributed over the productive parts of the land only. Looking at map No. 1 which shows the densities of population per cultivated sq. mile one finds variations from below 250 to above 2,000 persons per cultivated sq. mile. Pakistan on the whole supports 806 persons on a cultivated square mile. Conditions are a little better in West Pakistan where there are 566 persons per cultivated square mile though four times the average density of per square mile for the area. East Pakistan shows great average density of 1,222 persons per cultivated square mile in spite of a major proportion of its land under cultivation.

In East Pakistan the highest density of all the divisions is 1,486 persons per cultivated square mile in Chittagong division, and among districts the Chittagong district tops the table with 2,015 persons per cultivated square mile. Noakhali is a close second with 1,953 and Tippera with 1,851 persons is the third most densely peopled district of East Pakistan. No where in East Pakistan the density per cultivated square mile with the exception of Chittagong Hill Tracts falls below 800. Even the Chittagong Hill Tracts have to support 682 persons per cultivated square mile while there are only 57 persons per square mile of total area. This vast difference is mainly because of the hilly nature of the country which allows only a small proportion of the land to be tilled.

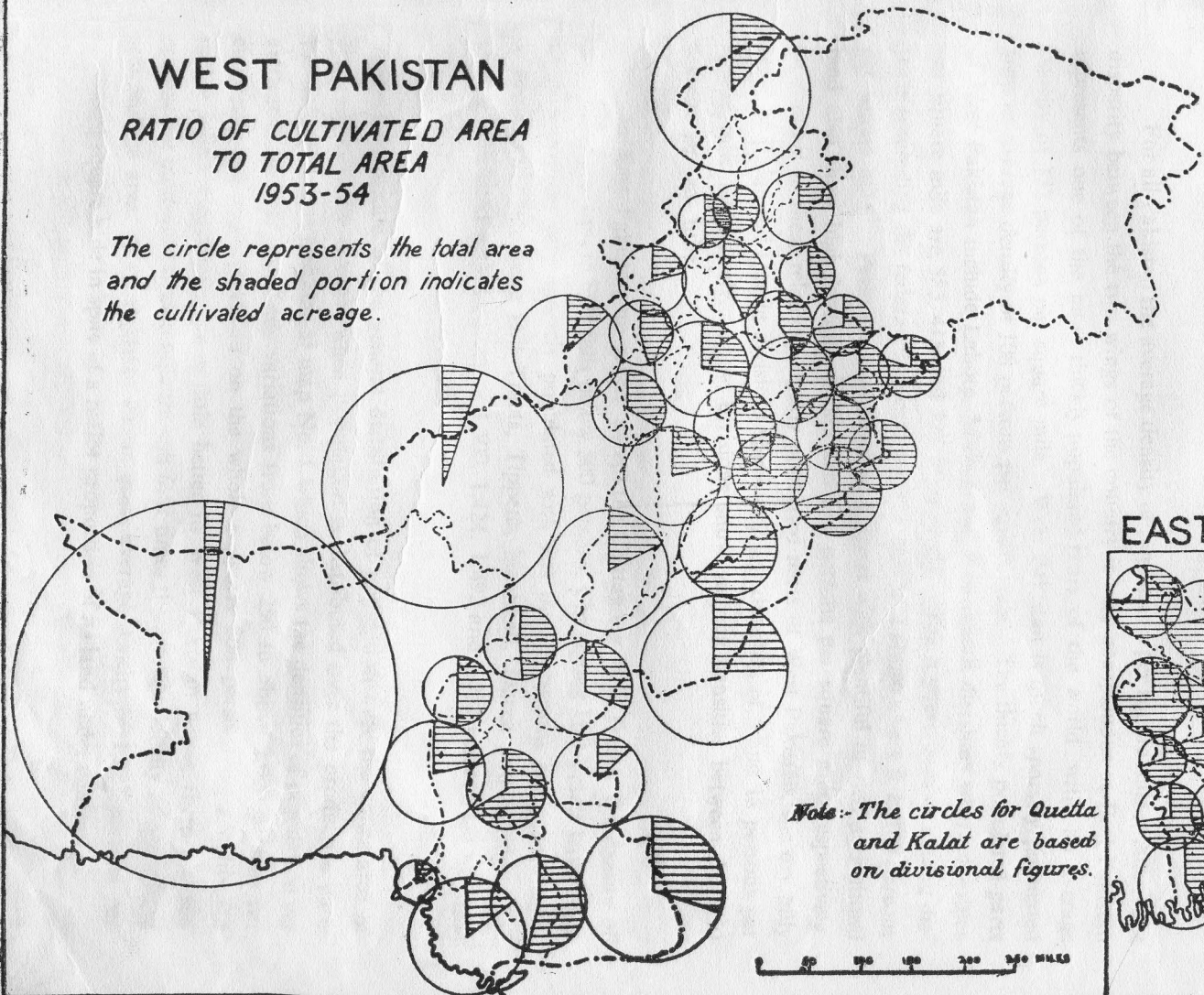
In West Pakistan the population does not seem to be so crowded as in the eastern wing. Generally speaking, very high densities per cultivated square mile appear in those areas which are otherwise very sparsely inhabited. In Kalat division less than 1% of the total area is cultivated, which gives an average density of some 3,000 persons per cultivated square mile. In East Pakistan densities per cultivated square mile are due to too many people, while in Kalat division it is due to the dearth of agricultural land on account of the paucity of rainfall and limited level land, most of the area being a rough plateau surface where even a cover of natural vegetation is a casual phenomenon. The cultivated land runs along the few small rivers and seasonal streams. Peshawar division also shows very high density of more than 1,200 persons per cultivated square mile. This high density is mainly due to the high figures of above 1,500 persons per cultivated square mile in the tribal area included in this division. Reasons for the high density per cultivated square mile in the tribal area are almost the same as for the Kalat division. Amongst the settled districts, Hazara tops the list with 1,093 persons per cultivated square mile, almost matching with the high densities in East Pakistan. Here the crowding is not due to great numbers but on account of the limited cultivated area, for most parts of the districts are hilly and mountainous. Flat land available for cultivation only exists along the river valleys. Mountain slopes are covered with forests or serve as natural pasture lands.

In the plain areas of West Pakistan the density per cultivated square mile is relatively lower than in the hilly areas, not due to lesser number of people but due to a greater proportion of the area available for cultivation. (See map 2). Lahore and Peshawar districts are the only exceptions where the densities per cultivated square mile are 1,239 and 1,156 respectively inspite of 67% of the total area of the former and 71% of the total area of the latter being under cultivation. These high densities are mainly due to the presence of large urban centres of Lahore and Peshawar which share more than 90% and 60% of the population of these districts respectively. These large industrial and commercial centres are the converging points for people

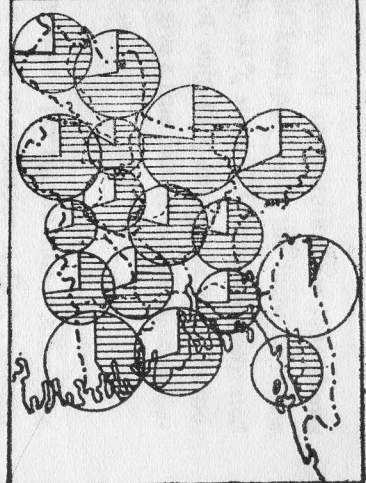
WEST PAKISTAN

RATIO OF CULTIVATED AREA TO TOTAL AREA 1953-54

*The circle represents the total area
and the shaded portion indicates
the cultivated acreage.*



EAST PAKISTAN

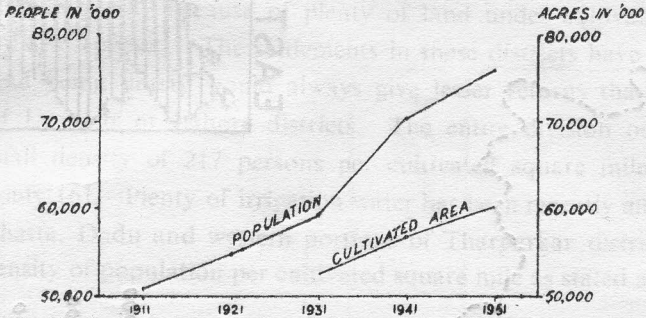


*Note:- The circles for Quetta
and Kalat are based
on divisional figures.*



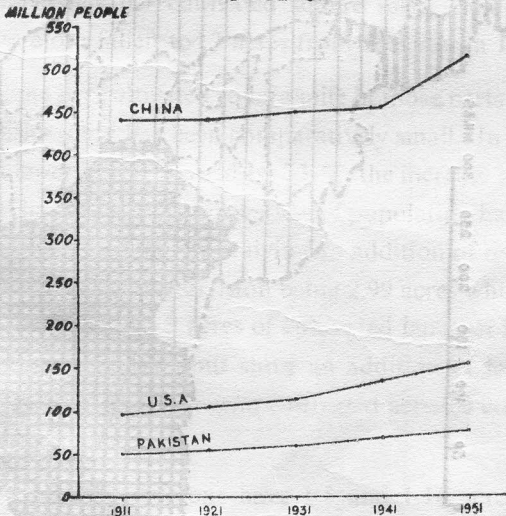
Graph No 1

PROGRESS OF POPULATION AND CULTIVATED AREA IN PAKISTAN



PROGRESS OF POPULATION SINCE 1911

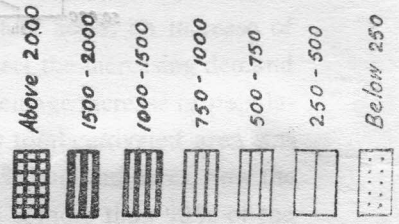
Graph No 2



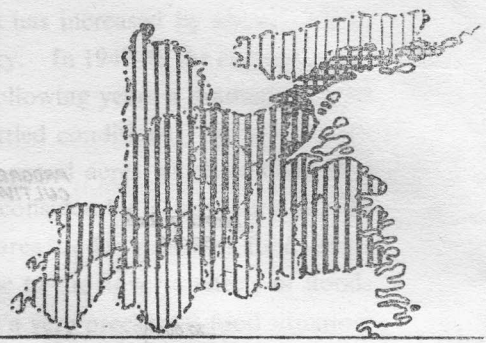
WEST PAKISTAN

DENSITY OF POPULATION
PER CULTIVATED SQ. MILE
1951

MILES 0 50 100 150 200 250 300 MILES



EAST PAKISTAN



of varied interests and have always been attractive for rural immigrants offering better chances of livelihood. Rawalpindi district also shows a high density of 969 per cultivated square mile partly on account of a smaller ratio of cultivated land and partly due to the large urban centre of Rawalpindi.

Tharparkar and Mianwali districts have population densities below 250 per cultivated square mile merely because of plenty of land under cultivation as compared to the number of people. The settlements in these districts have always been limited as the land being thirsty would always give lesser returns than the highly irrigated parts of Lyallpur or Lahore districts. The entire division of Hyderabad shows a very small density of 217 persons per cultivated square mile whereas in Tharparkar it is only 161. Plenty of irrigation water has been recently made available in Hyderabad, Thatta, Dadu and western portions of Tharparkar district which has given a smaller density of population per cultivated square mile as stated above.

Federal Area of Karachi shows a very high density of about 10,000 per cultivated square mile because of the large agglomeration of population in the capital city of Karachi.

The density per cultivated square mile has increased since 1931 which goes to prove that the amount of cultivated land though has actually increased but has shrunk in terms of *per capita*. In 1931 Pakistan had 717 persons per cultivated square mile but now as the density figures have risen there is an addition of 89 persons per cultivated square mile. In West Pakistan the addition amounts to 86 persons and in East Pakistan to 188 persons per cultivated square mile. The *per capita* share of cultivated land has therefore fallen to .7 acres from .9 acres in 1931.

Addition of people per cultivated square mile in those parts where the cultivated land has increased considerably has been comparatively small. In Hyderabad division, where since 1931 population has increased by 33 %, the increase in the cultivated land during the same period has been 19 %, the density of population has therefore increased from 192 to 217 per cultivated square mile giving an addition of only 25 persons. Cultivated land *per capita* is highest in this division being 2.99 acres while previously in 1931 the position was still better with 3.2 acres of cultivated land per head. Similarly the divisions of D. I. Khan and Bahawalpur show an addition of less than 100 persons per cultivated square mile and the *per capita* cultivated acreage comes to 1.5 and 1.12 respectively.

Rawalpindi and Multan divisions have 1.5 and 1.16 acres of cultivated land per head and show an addition of 123 persons per cultivated square mile each. In Rawalpindi division the fertile patches of soil are few and due to the rough nature of the surface irrigation facilities can not be provided adequately. The progress of the

cultivated land has therefore been slower than that of the population. The increase in the cultivated area in Multan has been considerable but these newly settled areas have attracted large number of new settlers and the population increase has been greatest here which has resulted in a smaller share of the cultivated acreage *per capita*. Lahore and Peshawar divisions have also increased their population densities per cultivated square mile by 189 and 133 respectively since 1931.

TABLE III

POLITICAL DIVISIONS	DENSITY OF POP. PER SQ. MILE 1951	DENSITY OF POP. PER CULTIVATED SQ. MILE		VARIATION	CULTIVATED AREA PER CAPITA	
		1931	1951		1931	1951
West Pakistan	108	480	566	86	1.4	1.12
Peshawar division	185	1,129	1,262	133	.56	.53
D. I. Khan division	98	392	451	59	1.62	1.50
Rawalpindi division	327	482	605	123	1.7	1.5
Lahore division	585	644	833	189	1.0	.7
Multan division	415	440	620	180	1.4	1.16
Bahawalpur division	96	355	448	93	1.8	1.12
Khairpur division	121	326	372	43	2.15	2.00
Hyderabad division	69	192	217	25	3.20	2.99
Quetta division	18	542	331	-211	1.1	1.9
Kalat division	6	3,964	3,592	-372	.16	.18
Karachi F. area	1,378	NA	10,429	NA	NA	NA
East Pakistan	777	1,034	1,222	188	.59	.52
Chittagong division	708	1,187	1,486	299	.54	.42
Dacca division	1,042	1,264	1,318	54	.50	.45
Rajshahi division	641	872	973	101	.73	.65
Pakistan	208	717	806	89	.90	.71
Egypt	54	..	2,151	..	..	.3
France	199	..	504	..	..	1.1
Germany	489	..	1,318	..	..	.5
China	123	..	1,416	..	..	.45
Japan	548	..	4,026	..	..	.15
U. S. A.	47	..	211	..	..	3.0
Indonesia .. .. .	..	..	1,750	..	..	.4

Greatest addition of 299 persons per cultivated square mile has taken place in Chittagong division of East Pakistan. Here the cultivated land *per capita* has decreased from .54 to .42. The density of population per cultivated square mile here is 1,486. In fact in all the divisions of East Pakistan productive land *per capita* is less than one acre the biggest share is for Rajshahi of .66 acres *per capita*. Dacca division has only added 54 persons per cultivated square mile with a density of 1,315 persons per cultivated square mile, the second highest in Pakistan after Chittagong, and equal to the densities per cultivated square mile in Germany.

Kalat and Quetta divisions are the two exceptions to the general rule of increased densities per cultivated square mile since 1931. These divisions show that the average density per cultivated square mile has decreased since 1931 by 372 and 211 persons in Kalat and Quetta divisions respectively. In Kalat division, population has remained just the same with a little deficit since 1911. But studying the figures for 1931, one finds an increase of about 19% where as the cultivated area has increased by 237% which has reduced the density of population per cultivated square mile and has thereby increased the *per capita* share of cultivated land from .16 to .18 acres. Similarly in Quetta division the cultivated land in 1931 was very small amounting to 520,000 acres or 2% of the total area. The latest figures show that it has increased to 961,000 acres, an addition of 117%. Population in the same period has grown by 25% only. The share of the cultivated land *per capita* has therefore increased from 1.1 to 1.9 acres.

Mianwali district of D. I. Khan division shows a slight decrease in the *per capita* share of the cultivated land from 2.5 to 2.3 in 1931 and 1951 respectively. (See map, 3). Population of the district has increased by almost 40,000 since 1931 which amounts to 10%. The cultivated area has also expanded with the development of new irrigation canals under the T. D. A.¹ plan. Previously what was a sandy waste in the Sind-Sagar Doab is now being converted into a fertile agricultural land.

Very few districts of Pakistan have more than two acres of cultivated land *per capita*. Tharparkar in lower Indus valley has 3.9 acres *per capita*, Mianwali 2.3 acres, Nawabshah 2.46 acres, Thatta 2.4 acres, Upper Sind Frontier 2.38 acres, Dadu 2.3 acres and D. I. Khan 2.3 acres. Districts which have less than one acre of cultivated land but more than .5 acres per head are Peshawar, Mardan, Hazara, Rawalpindi, Gujrat, Lahore, Gujranwala, Sialkot and Lyallpur in West Pakistan. In East Pakistan all the districts have under one acre of cultivated land per head except Chittagong Hill Tracts which has just about one acre.

Those areas which have less than .5 acres of cultivated land per head are Kalat division in West Pakistan, Chittagong, Noakhli, Tippera, Dacca and Faridpur districts

1. Thal Development Authority.

in East Pakistan. All the remaining districts not mentioned in the above categories in the two wings of Pakistan have cultivated area from 1 to 2 acres per head. Tribal areas included in Peshawar and D. I. Khan division all have less than .1 acre of productive land per head and therefore with the resultant high densities of above 1,500 persons per cultivated square mile join the Kalat division in the list of deficit areas from the point of view of food supply.

✓ A comparison with other countries of the world shows that Pakistan occupies an intermediate position as far as population densities per cultivated square mile are concerned. It is thinly populated as compared to China, Japan, Indonesia, Germany and U. K. where densities of population are 1,416, 4,206, 1,750, 1,318 and 1,807 persons per cultivated square mile respectively. As compared to Iran and Turkey, Pakistan is thickly populated. U. S. A. has only 211 persons per cultivated square mile with 3 acres of cultivated land per head. Argentina and Canada have 4.2 and 6.6 acres of cultivated land per head and densities of 150 and 100 persons per cultivated square mile respectively. India has 0.9 acres of cultivated land *per capita*, Pakistan has only 0.7 acres per head, 1.2 acres in West Pakistan and .52 acres in East Pakistan.

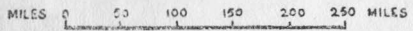
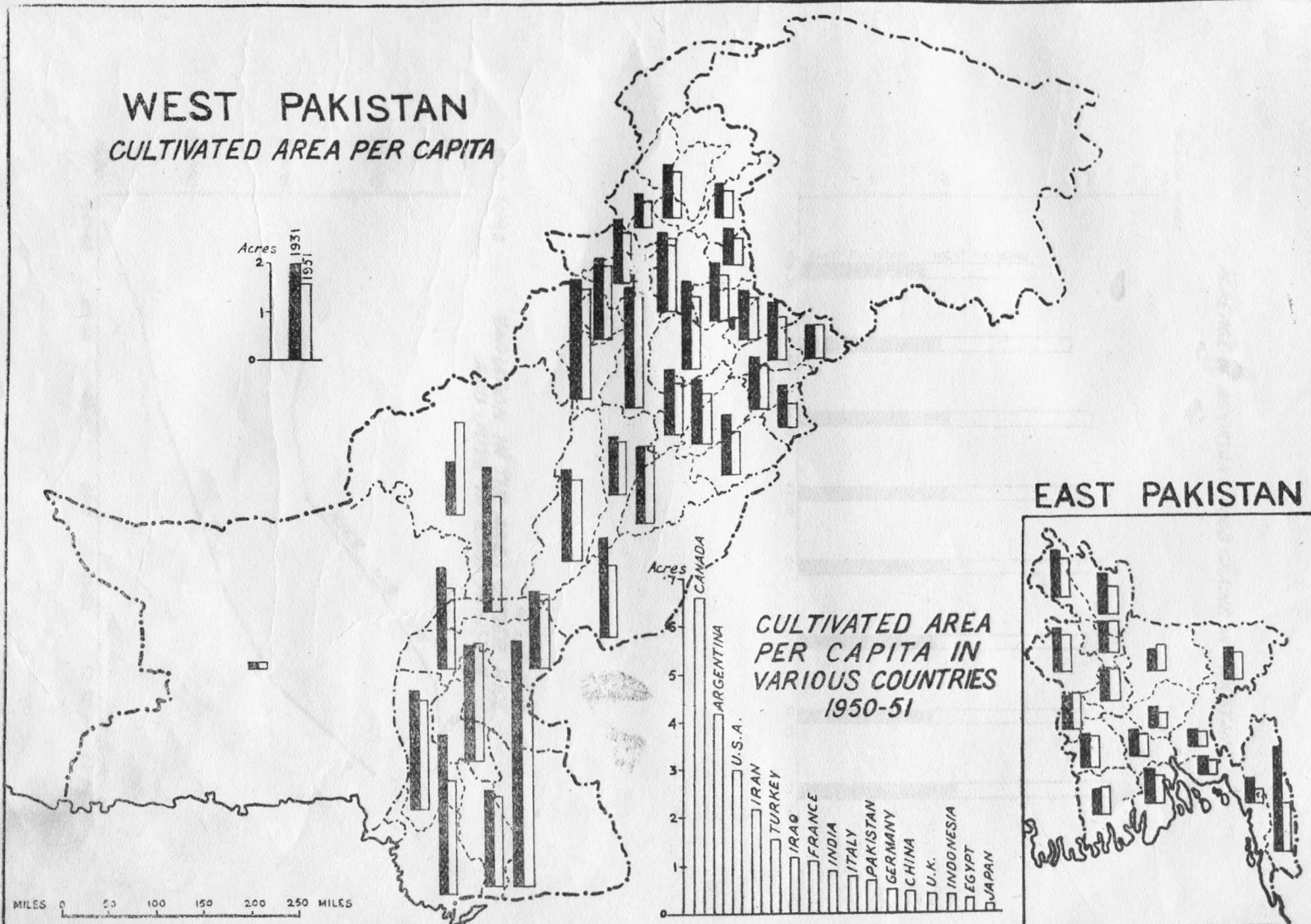
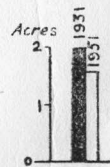
Though the low figures of cultivated land *per capita* show precarious food situation in many parts of the world but the productive power of land has also to be taken into account. Since the productive capacity of land varies from region to region each cultivated unit in various parts of the world has a different value as a result of the physical conditions of climate, soil, and human response, which takes into consideration methods of cultivation, type of cultivation, intensive or extensive, and the crops that are grown. Japan with very intensive methods of cultivation and very high returns per acre shows a slight deficit of about 3,000 thousand tons of food supply inspite of her only .15 acres of cultivated land per head and a density of more than 4,000 persons per cultivated square mile. The productivity factor thus plays a very important role in giving a certain value to a unit area, and it has to be taken into account while gauging the pressure of population on food resources of a country.

✓ In Pakistan the productivity of agricultural land is very variable. On unirrigated land the crops are at the mercy of weather conditions while on irrigated land the farmer finds himself on much securer ground, quite unconcerned with failures of rainfall at least. Floods are equally disasterous for both irrigated and unirrigated land. Soil fertility also varies from rich alluvial soils of Bengal and Indus valley to the alkali tracts in the semi arid zones of West Pakistan.

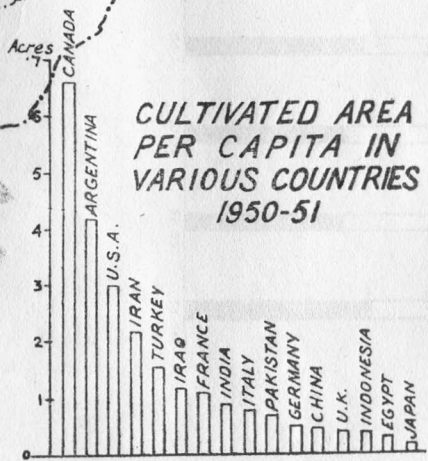
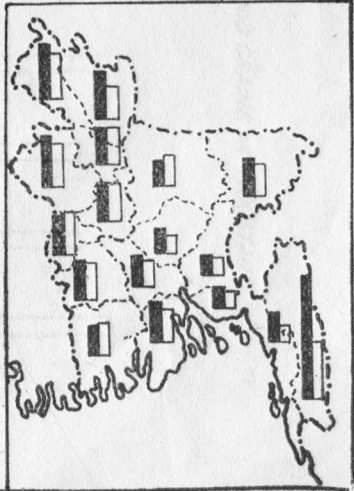
✓ About half of the area of West Pakistan is in plains built by the mighty Indus and its tributaries. Plains of Mardan and Peshawar drained by Kabul, the plains south

WEST PAKISTAN

CULTIVATED AREA PER CAPITA

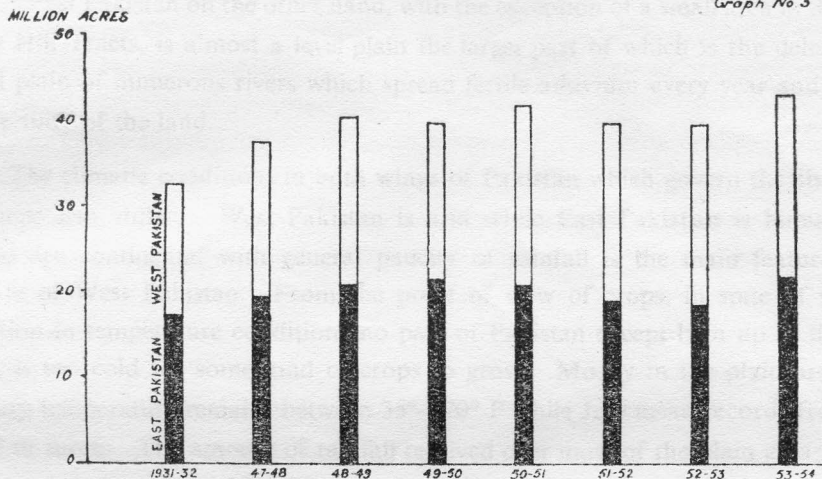


EAST PAKISTAN



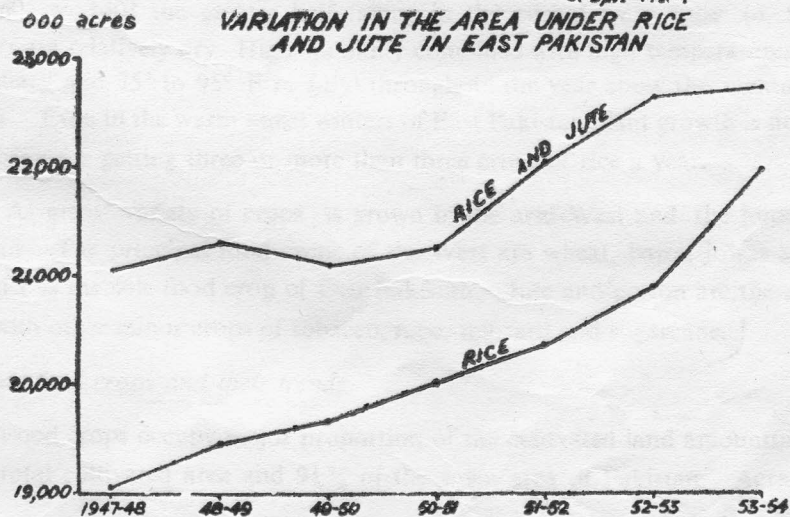
ACREAGE OF IMPORTANT FOOD GRAINS IN PAKISTAN

Graph No 3



Graph No. 4

VARIATION IN THE AREA UNDER RICE AND JUTE IN EAST PAKISTAN



of the Salt Range drained by Jhelum, Chenab, Ravi and Sutlej and the Lower Indus valley all built of alluvium brought by these rivers, are the graneries of West Pakistan. The mountainous parts in the north and north-west and the plateau of Baluchistan have limited cultivable area only along the small rivers and streams.

East Pakistan on the other hand, with the exception of a small area in the Chittagong Hill Tracts, is almost a level plain the larger part of which is the delta and the flood plain of numerous rivers which spread fertile alluvium every year and maintain the fertility of the land.

The climatic conditions in both wings of Pakistan which govern the distribution of crops also differ. West Pakistan is arid while East Pakistan is humid. Temperate dry continental with general paucity of rainfall is the main feature of the climate of West Pakistan. From the point of view of crops, in spite of the great variation in temperature conditions no part of Pakistan except high up in the mountains, is too cold for some kind of crops to grow. Mostly in the plain areas mean January temperature remains between 35°—70° F while July mean records from 80° to 90° F or more. The amount of rainfall received over most of the plain areas of West Pakistan is between 10—30" with a greater half coming in the three monsoon months of July, August and September. The total amount of rainfall is not adequate to meet the demand of various crops specially the Kharif crops without the aid of irrigation. Western hilly parts of West Pakistan which include the plateau of Baluchistan and the frontier hilly regions have more rainfall during winters from westerly depressions but vast areas of Baluchistan receive hardly any amount of rainfall, which usually remains under 5".

East Pakistan is humid in contrast to the west, rainfall is quite heavy varying from 60" to 140" the greater half falling in the period from June to September. Winters are relatively dry. High humidity combined with high temperatures (60°-70° F in January and 75° to 95° F in July) throughout the year allow the maximum plant growth. Even in the warm moist winters of East Pakistan plant growth is not retarded—a reason for getting three or more than three crops of rice a year.

A great variety of crops is grown in the arid West and the humid East of Pakistan. The principal food crops of the West are wheat, bajra, jowar and maize, while rice is the sole food crop of East Pakistan. Jute and cotton are the main cash crops with other minor crops of tobacco, rape, mustard and sugarcane.

The main food crops and their trends

Food crops occupy major proportion of the cultivated land amounting to 72% of the total cultivated area and 91% of the sown area of Pakistan. Acreage under

food crops has been fluctuating from year to year. A study of the figures since independence shows that the area under food grains has increased by about 13% in keeping with the increasing food demand in the country. In 1947-48 the acreage under principal food crops was 37,157,600 acres. In the following years a gradual increase was registered due to coming back to the normal settled conditions. In 1950-51 the acreage under food crops had gone up to 41,372 thousand acres which resulted in a bumper harvest, and an easy food situation with a considerable export surplus. In the agricultural years of 1951-52 and 1952-53 the area under principal food crops was reduced to 39,638 and 39,861 thousand acres due to the adverse effects of floods and abnormal incidents of rainfall. These years gave a very precarious food situation, when large quantities of wheat had to be imported to meet the shortage of food supply. The recovery has been more than full and the acreage under food crops now amounts to 43,720 thousand acres. Compared with the figures of 1931 the area under food crops has increased and its share in the total cultivated area has also increased. In 1931, the total area under food grains was 33,958.9 thousand acres, an increase of about 100,000 acres has been brought about since then to meet the increasing demand of food supply, more so in East Pakistan where a small percentage increase of population means a large number. In East Pakistan 80% of the total cultivated area was given over to food crops in 1931 which amounted to 17,029.3 thousand acres, now the principal food crops occupy 22,408.0 thousand acres, which is more than 90% of the total cultivated area. In West Pakistan too the area under food grains has increased from 15,929.6 to 21,262.6 thousand acres but the percentage share has decreased from 57 to 53% of the total cropped acreage.

Taking the two wings of Pakistan separately, the percentage of area under food crops varies considerably but in no part it is less than 50% of the total cropped, except in Hyderabad division.

In West Pakistan as a whole food crops occupied 57% of the total cropped area in 1931 while in East Pakistan it was 80%, Multan, Bahawalpur, Khairpur and Hyderabad divisions all had less than 50% of the cultivated area under food crops in 1931. Hyderabad had the least of all being 20% only. Higher percentage of 88 was found in the Rawalpindi division which covers a major proportion of the Potwar Plateau where irrigation is difficult and wheat occupies almost all the cropped acreage during Rabi. Similarly, Quetta division and D. I. Khan division with higher proportion of unirrigated land, had a greater percentage of the cultivated area under food crops and food is procured from whatever land is available for cultivation.

TABLE IV

ACREAGE UNDER VARIOUS FOOD CROPS IN PAKISTAN 1931 (000, ACRES)

	KHARIF				Total	RABI			Total	Grand Total	Sugarcane
	Rice	Bajra	Jauar	Maize		Wheat	Grain	Barley			
Peshawar division ..	23.9	172.0	65.1	403.9	654.9	1,076.1	99.7	140.7	416.5	1,071.4	40.1
D. I. Khan division	17.4	226.1	78.0	70.6	392.1	859.7	543.5	42.8	1,446.0	1,838.1	4.9
Rawalpindi division	18.2	383.8	108.6	82.6	593.2	1,511.2	903.2	36.6	2,451.0	3,044.2	22.2
Lahore division ..	314.3	721.9	10.1	90.4	1,136.7	1,393.9	546.6	57.0	1,997.5	3,132.2	101.9
Multan division ..	440.5	112.9	120.0	96.4	369.8	1,873.1	495.9	36.1	2,405.1	2,774.9	110.0
Bahawalpur division	142.4	145.2	245.3	6.1	539.0	986.6	328.6	35.7	1,350.9	1,889.9	14.0
Khairpur division	522.5	169.6	381.1	.2	1,073.4	205.8	254.0	.9	460.7	1,534.1	40.9
Hyderabad division	660.1	778.3	110.7	3.5	948.6	209.9	20.1	8.6	238.6	1,1187.2	2.7
Quetta division ..	48.2	4.3	109.9	6.6	169.0	262.4	20.1	6.3	288.6	457.6	..
Kalat division ..	..	..	..	..	..	..	..	..	..	..	..
Karachi Federal Area	..	..	..	..	..	..	..	..	..	..	..
Total West Pakistan	2,287.5	2,714.1	1,219.8	770.3	5,876.7	8,378.7	3,211.7	364.7	11,044.9	16,921.6	436.7
Total East Pakistan ..	16,867.0	..	.4	4.7	16,872.1	50.5	62.6	44.1	157.2	17,029.3	186.0
Total ..	19,154.5	2,714.1	1,220.2	775.0	22,749.8	8,429.2	3,274.3	408.8	11,202.1	138,950.9	622.7

This over all picture has not changed much. There has been an increase of 6% in the total cropped area under food grains which now amounts to 72% of the total cultivated area. In West Pakistan the percentage area under food grains has decreased from 57 to 53% from 1931-51 though actually the acreage has increased. In East Pakistan on the other hand the percentage of area under food crops has increased by 10% for the same period.

Graph No 5

DISTRIBUTION OF DAILY CALORIE SUPPLY PER CAPUT AMONG PRINCIPAL FOOD GROUPS

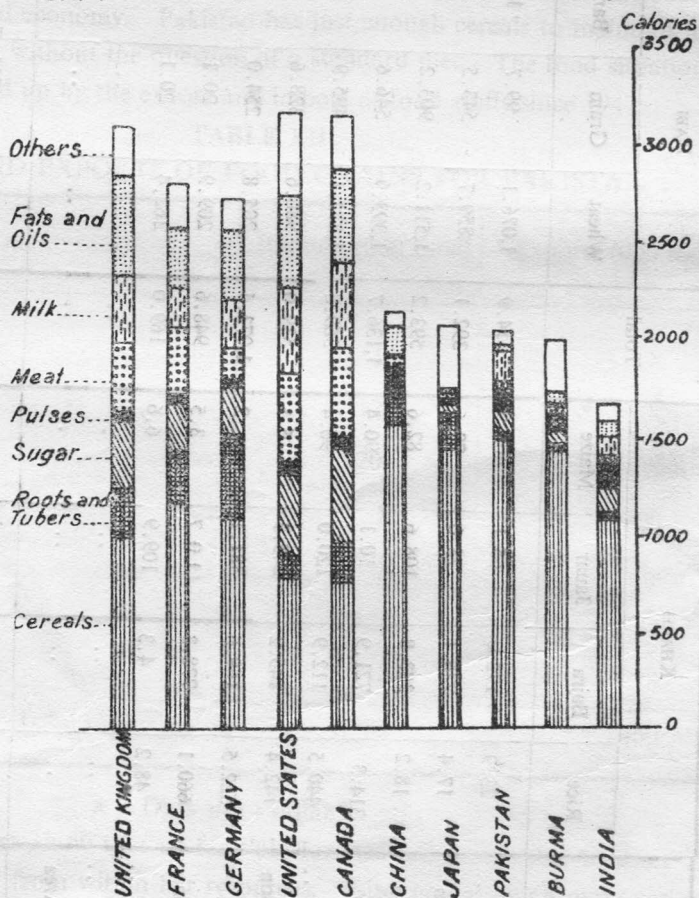


TABLE V-A

ACREAGE UNDER VARIOUS FOOD CROPS IN PAKISTAN 1953-54 (000, ACRES)

	KHARIF				Total	RABI			Total	Grand Total	Sugar-cane
	Rice	Bajra	Jowar	Maize		Wheat	Gram	Barley			
Peshawar division ..	4.7	17.1	11.5	205.7	239.0	251.3	13.9	50.5	315.7	554.7	1,234.8
D. I. Khan division	5.0	28.2	11.5	30.4	75.1	222.7	109.2	12.9	344.8	419.9	94.5
Rawalpindi division	21.6	104.5	31.3	29.2	186.6	528.0	86.5	11.8	826.3	812.9	338.0
Lahore division ..	263.1	44.2	4.5	54.6	366.4	572.1	70.3	26.5	668.9	1,035.3	1,866.0
Multan division ..	72.2	74.5	31.2	104.4	282.3	1,206.3	124.3	18.2	1,348.8	1,631.1	3,663.0
Bahawalpur division	31.3	65.4	74.5	7.2	178.4	443.0	72.4	14.3	529.7	708.1	100.6
Khairpur division ..	332.6	15.7	67.8	0.7	416.8	160.5	109.4	1.4	271.3	688.1	278.4
Hyderabad division	148.5	103.4	29.2	0.7	281.8	217.5	2.2	2.1	221.8	503.6	106.7
Quetta division ..	17.9	0.3	12.6	2.4	33.2	51.5	3.2	1.0	55.7	88.9	..
Kalat division ..	..	..	0.1	..	0.1	2.0	..	..	2.0	2.1	..
Karachi Federal Area	..	..	..	..	..	..	..	..	..	..	..
Total for West Pakistan.	896.9	453.3	274.2	435.3	2,059.7	3,654.9	591.4	138.7	4,385.0	6,444.7	8,662.0
Total East Pakistan	8,245.0	.5	.5	2.0	8,248.0	24.0	54.0	16.0	94.0	8,342.0	397.0
Total ..	9,141.9	453.8	274.7	437.3	10,307.7	3,678.9	645.4	154.7	4,489.0	14,786.7	9,059.0

TABLE V-B

PRODUCTION OF VARIOUS FOOD CROPS IN PAKISTAN 1953-54 (000, TONS)

	KHARIF F. C.				Total	RABI F. C.			Total	Grand Total	Sugar-cane
	Rice	Bajra	Jowar	Maize		Wheat	Gram	Barley			
Peshawar division ..	15.6	167.4	54.1	471.4	708.5	1,075.8	76.8	175.5	1,328.1	..	118.0
D. I. Khan division	17.4	239.7	114.4	76.5	448.0	1,032.1	652.7	68.0	1,752.8	..	11.5
Rawalpindi division ..	59.0	560.6	152.2	117.8	892.6	1,611.1	374.4	45.0	2,030.5	..	29.3
Lahore division	634.7	214.6	16.0	118.5	983.8	1,545.0	268.1	101.0	1,823.1	..	170.3
Multan division ..	182.9	279.6	131.5	224.0	817.6	2,351.2	423.7	55.2	2,830.1	..	259.8
Bahawalpur division	152.3	361.9	430.6	35.1	979.9	1,354.0	276.1	55.4	1,685.5	..	80.5
Khairpur division ..	867.0	70.4	323.6	1.9	1,262.9	605.9	461.7	5.2	1,072.8	..	18.0
Hyderabad division	519.5	683.1	155.1	4.8	1,362.5	776.0	12.3	14.5	802.8	..	11.4
Quetta division ..	169.8	5.1	105.3	9.6	189.8	247.2	19.2	5.3	271.7	..	..
Kalat division ..	..	..	..	..	4.1	15.0	..	..	15.0	..	..
Karachi Federal ..	..	..	..	..	..	..	..	..	..	..	..
Total West Pakistan	2,518.2	2,582.4	1,489.8	1,059.6	7,649.7	10,552.3	2,565.0	2,565.0	13,612.4	..	698.8
Total East Pakistan	22,010.0	1	1	10.0	22,022.0	98.0	203.0	203.0	386.0	..	262.0
Total ..	24,528.2	2,583.4	1,490.8	1,069.6	29,617.7	10,650.3	2,768.0	2,768.0	13,998.4	..	960.8

A great increase in the share of food crops is recorded in Peshawar division from 47% to 75% of the total cropped acreage. Rawalpindi, D.I. Khan and Lahore divisions have more than 60% of the cultivated land under various food crops. Hyderabad division still has less than 50% of the area under food grains. The only division which registers a percentage decrease is Quetta, where the expansion of the cultivated area has been more than 100 percent as discussed previously and a fair proportion of the tilled land is given over to the production of fruits. The actual area under food crops has increased from 458,000 acres in 1931 to 461,000 acres in 1953-54, while the percentage share has decreased from 80 to 48.

✓ On the whole Pakistan devotes much of its cultivated area for the production of food crops to feed her large population. The production of food grains in 1953-54 amounted to 14,786 thousand tons which comes to about 5 maunds of food grains per head.

Amongst the food crops, wheat is the main staple for west Pakistan and rice for East Pakistan. Wheat is the sole important Rabi food crop and on this crop depends the food situation of the country. Though it occupies less than half the area under rice, it shares 27% of the total cropped area, 50% of the total area under food crops and 77 percent of the Rabi sowings in west Pakistan. It is sown from mid-September to mid-November and harvesting begins from the end of April and continues till the end of May. More than half the acreage under wheat is irrigated. Yields are high on irrigated fields, about 10-12 maunds per acre but lower on unirrigated land varying between 5 to 7 maunds per acre. The average yields for all Pakistan comes to about 7.7 maunds per acre.

Fluctuations in the wheat crop due to abnormal physical conditions have always lead to serious situation as regards food supply in Pakistan. Unirrigated crops suffer more from the deficits of rainfall. Autumn rainfall affects the area under unirrigated wheat. Wheat crop of 1951-52 and 1952-53 has suffered due to abnormally low autumn rainfall and the acreage was reduced to 10,240 and 9,529 thousand acres from 10,824 thousand acres during 1947-48. Wheat acreage of 9,524 thousand is the lowest on record since independence. This resulted in a serious food deficit as the yields were also reduced. The production fell from an average of 4,000 thousand tons to only about 2,390 thousand tons in 1952-53.

The record year for the production was 1948-49 with 4,084 thousand tons, production was also high in the following year and the food situation in the country was therefore easy and derationing and decontrol of food grains was introduced in the country. Wheat was sold at Rs. 5-6 a maund during that year.

TABLE VI-A

ACREAGE UNDER VARIOUS FOOD CROPS IN PAKISTAN (000, ACRES)

		1947-48	1948-49	1949-50	1950-51	1951-52	1952-53	1953-54	Average
RICE	East Pakistan	19,00610	15,424	19,528	20,007	20,301	20,778	22,010	20,525
	West Pakistan	1,91514	2,121	2,305	2,393	2,181	2,242	2,523	2,329
	Total	20,92114	21,545	21,833	22,400	22,482	23,020	24,533	22,854
WHEAT	East Pakistan	848	95	96	94	96	98	98	96
	West Pakistan	9,3708	10,729	10,337	10,799	10,144	9,431	10,553	10,253
	Total	9,4556	10,824	10,433	10,893	10,240	9,529	10,651	10,349
BARLEY	East Pakistan	734	85	87	82	82	86	85	84
	West Pakistan	4224	526	497	430	434	482	528	474
	Total	4958	611	584	512	516	568	613	558
MAIZE	East Pakistan	64	7	12	13	10	10	10	11
	West Pakistan	8966	958	990	935	969	969	1,043	984
	Total	9030	965	1,002	948	979	979	1,067	995
BAJRA	East Pakistan	3	1	1	1	1	1	1	1
	West Pakistan	1,9940	2,298	2,368	2,406	2,018	2,212	2,584	2,318
	Total	1,9943	2,299	2,369	2,407	2,019	2,213	2,585	2,319
JOWAR	East Pakistan	3.1	1	3	1	1	1	1	1
	West Pakistan	1,0232	1,091	1,362	1,254	1,090	1,316	1,503	1,305
	Total	1,0269	1,092	1,365	1,255	1,091	1,317	1,504	1,306
GRAM	East Pakistan	2077	206	201	200	201	202	203	201
	West Pakistan	2,1535	2,713	2,399	2,757	2,110	2,033	2,564	2,373
	Total	2,3612	2,919	2,600	2,957	2,311	2,235	2,767	2,574
TOTAL	East Pakistan	19,3817	19,819	19,968	20,398	20,693	21,176	22,408	20,919
	West Pakistan	17,7759	20,436	21,218	20,974	18,945	18,695	21,312	20,036
	Total	37,1576	40,255	40,186	41,372	39,638	39,861	43,720	40,955

TABLE VI-B

PRODUCTION OF VARIOUS FOOD CROPS IN PAKISTAN (000 TONS)

		1947-48	1948-49	1949-50	1950-51	1951-52	1952-53	1953-54	Average
RICE	.. East Pakistan	6,543	7,673	7,378	7,343	7,034	7,335	8,245	7,467
	.. West Pakistan	643	756	793	852	722	816	906	818
	.. Total	7,186	8,429	8,171	8,195	7,756	8,151	9,151	8,28
WHEAT	.. East Pakistan	191	19	23	20	23	24	24	23
	.. West Pakistan	3,252	4,084	3,862	3,930	2,949	2,366	3,659	3,533
	.. Total	3,271	4,103	3,885	3,950	2,972	2,390	3,683	3,376
BARLEY	.. East Pakistan	14	16	17	15	16	17	16	11
	.. West Pakistan	112	663	145	129	100	92	140	126
	.. Total	126	179	162	144	116	109	156	137
MAIZE	.. East Pakistan	1	2,410	3	3	2	2	2	93
	.. West Pakistan	347	412	401	381	376	346	435	39
	.. Total	349	2,822	404	384	378	348	437	..
BAJRA	.. East Pakistan	..	373	..	..	..	..	..	..
	.. West Pakistan	293	373	371	385	266	67	455	49
	.. Total	294	746	371	385	266	267	455	343
JOWAR	.. East Pakistan	..	213	..	..	..	..	..	..
	.. West Pakistan	203	213	269	243	204	220	280	245
	.. Total	203	426	269	243	204	220	280	243
GRAM	.. East Pakistan	49	749	52	47	52	33	54	522
	.. West Pakistan	1,960	751	601	744	423	315	591	5
	.. Total	2,009	800	653	791	475	368	645	587
TOTAL	.. East Pakistan	6,629	7,795	7,473	7,429	7,127	7,431	8,341	7,560
	.. West Pakistan	6,812	6,750	6,343	6,421	5,150	4,422	6,466	5,707
	.. Total	13,442	14,509	13,815	13,815	12,177	11,853	14,807	13,627

Wheat is a very minor crop in East Pakistan. There the climate is not ideal for wheat. Moreover it cannot compete successfully with rice for space as the latter crop is heavy yielding. Less than 100 thousand acres are given to wheat, while the production amounts to 24 thousand tons only.

Other Rabi crops are grams and barley which occupy about 2,500 thousand and 600 thousand acres respectively. The production of these crops amounts to about 600 thousand and 150 thousand tons annually—gram and barley do not compete with wheat but are rather supplementary to it. Grams require well aerated sandy loam not retentive of moisture and is thus cultivated in relatively drier parts than wheat. It is relatively a poor yielding crop and very sensitive to moisture supply. D. I. Khan division shows the most widespread distribution of grams where it is a second food crop after wheat and occupies about 652.7 thousand acres, a little less than one third of the total area under food crops. Light sandy soils in the D. I. Khan and Bannu districts are well suited for its growth. It yields about 6—7 maunds per acre.

Barley also accepts inferior conditions of growth. It can yield a fair harvest even on poorer soil and can also stand drought better than wheat, though when irrigated, barley yields very high. First choice for Rabi crops is for wheat in all parts of West Pakistan and marginal position is occupied by these two crops.

All these Rabi crops are unimportant in East Pakistan as they are over shadowed by the overwhelming distribution of rice. For West Pakistan Kharif food crops are of lesser importance than Rabi. Bajra, jowar and maize come in order of the acreage sown which is about one-third of the total sown in Rabi under food crops. West Pakistan being arid requires plentiful of water supply for Kharif crops. Most of the irrigation water is supplied to the cash crops while only those food crops are grown in Kharif which could also do well with very little irrigation water or none at all so that the irrigation water could be supplied to the cash crops. Bajra and jowar occupy about 3,600 thousand acres of which bajra has about 2,500 thousand acres, Amongst these two crops, bajra requires less water so its distribution is more widespread than that of jowar.

Bajra is the most important Kharif crop in Rawalpindi division where it occupies about 70% of the total Kharif acreage. In Hyderabad division also, it occupies about 683,000 acres in spite of the large acreage under rice, as it does not compete with rice for its requirements are different. In D. I. Khan also, it is the first Kharif crop. In other divisions it is a minor Kharif crop.

Jowar production is much less than bajra as it requires relatively larger quantities of water than bajra and yields less than rice and maize which factors give prefer-

ence to bajra in irrigated tracts with poor soil and to rice and maize in rich irrigated tracts.

Maize is another Kharif crop grown over a small area of about 1,000 thousand acres only. Maize is restricted in its distribution for its heavy demands of water. It also requires clay loams for its best returns. Considerable quantities are grown in the Peshawar and Mardan plains and other plain areas of Lahore and Multan divisions. The highest yields of 12 maund per acre are obtained from Peshawar and Mardan districts. Unirrigated maize which just depends on the monsoon rainfall yields 6 to 7 maunds per acre only. In Peshawar and Mardan plains however it competes with sugarcane for Kharif acreage. In Khairpur and Hyderabad divisions where there is plenty of irrigated water, it suffers from competition with rice more than in Lahore and Multan divisions. Ideal conditions for maize exist in most parts of East Pakistan where its acreage is only too small to be considered as it suffers from competition from rice for land and water.

Rice is the sole crop of East Pakistan occupying a very insignificant place in West Pakistan. 92% of the total rice of Pakistan is grown in East Pakistan and only 8% is shared by West Pakistan, yet it is West Pakistan which mostly contributes towards the export of rice. Warm and humid environment, plenty of level land built of rich alluvium brought by rivers suit the crop, and as many as three harvests of rice are generally obtained during the course of a year. The total area under rice in Pakistan is about two and a half times that of wheat. Whereas other food crops, which have so far been considered, do not show any rise since independence, rice has shown a marked increase in its acreage. In 1947-48 the area under jute was 2,059 thousand acres, whereas rice occupied about 19,006 thousand acres. With the drawing of the boundary lines between East and West Bengal all the jute mills went to India while a major proportion of the jute growing area was left in East Pakistan. It created a great problem for the disposal of this golden fibre at convenient profits while on the other hand the demand for food supply had risen. Both these factors resulted in a change over of some area from Jute to rice. The rise in the area under rice is specially more marked after 1951-52. Jute acreage has been reduced to 760 thousand acres, almost to one-third of the acreage in 1947-48. The acreage under rice has thus registered a rise of 16% from 19,006 thousand acres in 1947-48 to 22,010 thousand acres in 1953-54. (See graph 4). Fluctuations in the rice production have been taking place on account of physical factors some times resulting in precarious food situation. Food situation further deteriorated, along with a deficit of wheat in West Pakistan, in 1950-51 and 51-52 when inspite of over 20,000 acres under rice, the production fell to about 7,034 thousand tons due to the damage done by the floods. It resulted in a great food shortage in both the wings of Pakistan.

Rice is the staple food crop in East Pakistan not only because of the ideal climatic conditions but more so because of its heavy yielding qualities capable of supporting greater number of people per cultivated acre.

Rice is a minor food crop in West Pakistan. It occupies only about 2,500 acres or 8% of the total rice acreage of Pakistan. In drier and unirrigated parts of West Pakistan bajra and jowar are given preference for their tolerance to the general paucity of water. Besides these cereals, which serve as the major food crops, Pakistan has a very small acreage under vegetables and fruits. Vegetables occupy a small place in our diet, specially in rural areas. Usually one finds vegetable growing and truck farming practised only near the large urban centres where the population concentration offers a ready market with reasonable profits for these perishable products.

Pakistan has only about 470,000 acres under vegetables and produces about 793,000 tons of vegetables. It forms only .77% of the total cropped area of Pakistan. East Pakistan has more area under vegetables than the West. Usually vegetable growing is carried on by intensive methods of cultivation. Heavily manured and carefully well-worked fields yield many harvests during a year. On the average one acre under vegetable yields about 1.7 tons of vegetables.

Amongst the tuber crops potatoes are the most important. Potatoes are grown in Pakistan both as a summer as well as a winter crop; Pakistan has only 150,000 acres or .2% of its cultivated area given over to this crop. Potatoes generally require light sandy friable loams. Heavy manuring and proper watering are essential for profitable returns. Its cultivation in East Pakistan is mostly confined to Dacca, Mymensingh, Chittagong and Tippera districts. Lahore, Shahpur, Multan, Sialkot, Rawalpindi, Sukkur, Hazara, Quetta and Bahawalpur districts of West Pakistan grow some potatoes. The yields vary from 15—100 maunds per acre. East Bengal has higher yields per acre between 90—100 maunds per acre while in West Pakistan high yields are obtained only from Lahore and Rawalpindi divisions. In Quetta division yields vary from 70 to 75 maunds of potatoes per acre.

Standard of living in Pakistan is so low that it does not allow an average person to take fruits as a regular part of his diet. Home market for fruits is very limited and arrangements for the preservation of perishable products are inadequate. There are only 654,000 acres under fruits which forms only 1% of the total cultivated area. More than 73% of the total area under fruits is in East Pakistan which grows tropical fruits like bananas, mangoes, coconuts and pineapples. Citrus fruits form only a small proportion of the area under fruits in East Pakistan. In West Pakistan climate suits for the cultivation of citrus fruits which occupy more than $\frac{1}{3}$ of the total area under fruits. Citrus fruits are mostly grown in Lahore, Gujranwala, Shahpur and Montgo-

mery districts. Mangoes and dates are among other fruits grown mostly in Multan, Bahawalpur and Khairpur divisions. Grapes come entirely from the frontier divisions of Peshawar and Quetta. West Pakistan produces about 6,000 tons of grapes on over 3.2 thousand acres.

Besides cereals vegetables and fruits, sugar is also considered to be an item of food. Sugar production in Pakistan is not adequate to meet the meagre home demands although Pakistan is making rapid progress towards self sufficiency in its sugar supply. Sugar in Pakistan is derived from sugarcane. In 1931, Pakistan had only about 623 thousand acres under sugarcane, which formed only 1.1% of the total cultivated area. By 1947, the area had increased to 690 acres, the increase amounted to 9%. There has been a steady increase in the area under sugarcane with the expansion of area under irrigation since independence. Now it occupies 960 thousand acres, almost one and a half times the acreage in 1947-48. Almost all the sugarcane in West Pakistan is irrigated, and its cultivation has been closely related to the irrigation schemes. West Pakistan has 698.8 thousand acres under sugarcane and the production of sugarcane amounts to about 8,662.0 thousand tons. The average yield is about 1.2 tons per acre. The largest acreage under sugarcane is in Multan division followed by Peshawar division with 118.0 thousand acres, less than half of that in Multan division. Lahore division and Rawalpindi division grow some sugarcane. In the lower Indus valley in Hyderabad and Khairpur divisions it suffers from competition from rice which requires large quantities of water.

In East Pakistan sugarcane is grown over a small area of about 262 thousand acres, which is only about 20% of the total area under this crop in Pakistan. Here though there is plenty of water and rich soil, much land is not available for it, rice being sown over more than 90% of the cultivated area.

Consumption of sugar in large quantities is a luxury, but Pakistan does not produce even for her small *per capita* consumption. It is expected that with the expansion of irrigated area, Pakistan shall be soon meeting its own requirements of this expensive food item.

Yields of crops.—While considering the production of various crops in Pakistan, it is also important that one should compare the productivity of our land in terms of per acre returns with other countries in the world. Generally speaking for the country as a whole, yields of crops are low in Pakistan in keeping with the primitive methods of cultivation.

TABLE VII

YIELDS OF SOME FOOD CROPS IN DIFFERENT COUNTRIES OF THE WORLD

MAUNDS/ACRE

	Wheat	Rice	Maize
U. S. A.	12.0	28.0	24
Argentina	8.2	37.6	15
Canada	15.8	..	34
United Kingdom	28.0	..	..
Germany	24.0	..	29
France	18.5	..	16.8
Japan	18.2	42.0	16.2
China	10.8	..	14.0
Indonesia .. .. .	..	20.7	8.2
Turkey	12.0	38.0	14.7
India	7.0	11.0	6.8
Pakistan	10.0	14.0	11
World average	11.8	17.1	16.8

Apart from the physical factors of climate and soil which determine the inherent productivity of land, there are many other factors which effect the yields. Human factor is very important while considering the productive capacity of land. Intrinsically the soils of Pakistan are among the most fertile in the world but owing to the continuous cultivation through the ages without proper manures and rotation they have become impoverished in many parts. Wheat yields are below the world average and lower than in all the important wheat producing countries of the world except Argentina and India. In Pakistan average yields of wheat are about 10 maunds per acre, highest yields are obtained in the canal colonies of Multan where it reaches an average of 12 maunds per acre. In Germany and U. K. wheat yields are more than double of that in Pakistan, Japan with very intensive methods of cultivation

produces three times as much rice from one acre as Pakistan, a very important factor in easing the food situation of a country where population densities are great. Yields are low for all other crops like maize, jowar and bajra.

Causes of this low yield as compared to that in other parts of the world are not far to seek. Rotation of crops is practised only in some intensively cultivated areas, while fodder crops and leguminous crops occupy a minor position in the rotation of crops. Current fallow that amounts to 10,625 thousand acres or 26% of the total cultivated is left to take its own care. It is not worked well or kept clear of the weedy growth that decreases the productive energy of the land. Manuring is generally practised only for cash crops. Recently attention is being paid to proper tilling and manuring of land under grow more food campaign. Farmers are learning a better use of cowdung in the fields than in the fire places. Chemical fertilizers are also becoming familiar with the village folks. According to the statistics that are available about 100,000 tons of chemical fertilizers have been distributed to the cultivators during 1953-54 at one-third of the cost price.

Better seeds are also selected for sowings in order to assure better yields. Apart from the damage to the crops caused by weather conditions, considerable quantities of food grains are lost by plant diseases and insect pests in the field and in the badly built storages. Control of pests and locusts has become one of the serious problems of today's agriculture in Pakistan.

Irrigation has affected the productivity of the land a great deal in West Pakistan which suffers from scanty and unreliable rainfall. Apart from the extension of cultivated area which is closely related to the extension of irrigated area by wells and canals, productivity has also increased greatly as yields of crops from the well watered lands are almost one and a half times that from barani lands and even double the amount is not a rare occurrence. Water of the Indus basin is being utilized more economically with the construction of new canals, but still a large quantity of water during the rainy season, when the rivers are in spate, goes waste.

Early irrigation works started in the 19th century while wells were already in existence and represented the oldest method of irrigation in the country. By 1931, 31% of the total cultivated area of Pakistan had been irrigated out of which only a quarter was irrigated by wells and tanks etc. The percentage of the irrigated area was much higher in West Pakistan where it amounted to 52% of the total cultivated. The highest proportion of irrigated land was in Lahore and Multan divisions where more than 90% of the total cultivated area was irrigated. Only 20% of the cultivated area in East Pakistan was irrigated. A comparison of the figures for 1931-32 and 1953-54, given in Table VIII, shows the progress of irrigation since 1931.

Now in West Pakistan 58% of the total cultivated area is irrigated and it amounts to 75.4% of the total sown area. Out of the total area of 6.1 m. acres brought under cultivation since 1931, 5.2 million acres have been irrigated, giving an increase of 33% in the irrigated acreage since 1931. This shows how closely the irrigation expansion and the increase in the cultivated area are related.

The progress of irrigation has been slow since 1931, as many large scale irrigation schemes had already been completed. The highest percentage of irrigated land is in Multan division where 88% of the total cultivated and 96% of the net area sown is irrigated. Lahore and Bahawalpur have 69 and 64% of the cultivated area and 75 and 80.4% of the net area sown irrigated.

TABLE VIII

	Irrigated area (000, acres) 1953-54	% OF TOTAL CULTIVATED		% of total sown 1953-54
		1931-32	1953-54	
West Pakistan	21,659.5	52	57	78
Peshawar Division	847.4	31	32	35.9
D. I. Khan	467.1	13	17	21.6
Rawalpindi Division	1,553.7	35	37	42.5
Lahore Division	2,762.8	93	69	75.4
Multan Division	6,340.5	100	88	96.0
Bahawalpur Division	3,082.6	49	64	80.0
Khanpur Division	2,528.4	43	58	100
Hyderabad Division	3,432.7	21	50	100
Quetta Division	572.0	100	50	100
Kohat Division	20.6	20	20	100
Karachi Federal Area	51.7	N. A.	74	74
East Pakistan	404.0	1	2	3
Pakistan	22,063.5	31	35	47

In the Rawalpindi division the rough and stony nature of the country of Potwar does not allow any large scale irrigation schemes to be carried out. Besides this, water-table is very low and boring of wells is difficult except near the stream beds.

In the Lower Indus basin, in Khairpur and Hyderabad, it is interesting to note that, though only 54% of the cultivated area is irrigated, almost 100 per cent of the net area sown is irrigated.

Out of the total area irrigated in the Indus basin, 81% is contributed by the Government and private canals while the rest is irrigated by wells and tanks etc. This high percentage of irrigated area by canals shows the importance of the surface drainage in Pakistan. Indus and its tributaries coming from the snow-clad mountains are a gift of nature and the alluvial plains a gift of these rivers.


Waters of the Indus, Ravi, Chenab, Sutlej, Jhelum, Kabul and Swat have been utilized for this purpose. Excellent canal systems exist in Lahore, Multan, Bahawalpur, Khairpur and Hyderabad divisions. Canals generally take off from the left bank of the rivers.

Irrigation in the Peshawar division is restricted to the fertile plains of Peshawar and Mardan districts where wheat, Maize and sugarcane are the main irrigated crops. Three canals, the Upper Swat, the Lower Swat and the Kabul Canal are the main irrigation channels.

In Bannu district, the Kachkot and in D. I. Khan district the Paharpur canal supply almost all the irrigation water.

In Lahore, Multan and Bahawalpur divisions the canal irrigation is in excellent form. The main canal systems are given in Table IX.

TABLE IX

Canals and Head works	Area Irrigated	REMARKS
1. Upper Bari Doab Canal Madhupur on Ravi.	1.1 m. acres in Upper Bari Doab.	This headwork now lies in the Indian territory.
2. Lower Bari Doab Canal Balloki on Ravi.	1.2 m. acres in Ganji-Bar.	
3. Upper Chenab Canal Merala on Chenab.	Upper portion of Rechna Doab.	
4. Lower Chenab Canal, Khanki on Chenab.	2.5 acres in Nilibar.	
5. Upper Jhelum Canal, Mangla on Jhelum.	200,000 acres.	
6. Lower Jhelum Canal Rasul on Jhelum.	800,000 acres in Sargodha colony.	

The Upper Jhelum, the Upper Chenab and the Lower Bari Doab canals form the Tripple Canal Project. It connects the waters of the three rivers. Extra water of river Jhelum is brought through the Upper Jhelum Canal to Chenab and the extra water of Chenab is passed into Ravi by the Upper Chenab Canal so that there may be plentiful of water in the Lower Bari Doab Canal.

Sutlej Project.—This plan was completed during the prepartition times. Four dams were constructed, three on Sutlej, at Ferozepore (Gandasinghwalā now in India) Sulemanki and Islamabad, and one at Panjnad. Canals on both sides of Sutlej irrigate the Nilibar colony in Multan and Bahawalpur division. Dipalpur canal taking off from Ferozepore head-works irrigating large areas in Lahore district suffers from storage of water.

Sidhnai canals taking off from river Ravi at Sidhnai irrigate a considerable area. Similarly, Haveli canals taken off below the junction of Jhelum and Chenab irrigate parts of Jhang and Muzaffargarh districts. Besides these perennial canals, inundation canals irrigate over a million acres during the Kharif season.

Thal Project.—A dam on the Indus near Kalabagh at Daud Khel has been constructed to irrigate a large portion of the Thal desert between Jhelum and Indus. More than a million acres in Shahpur, Mianwali and Muzaffargarh districts will be further irrigated at the completion of the project. Much of the work has been completed and new towns like Qaidabad, Jauharabad and Liaquatabad have grown. It is a great step towards increasing the agricultural production of the country.

In the lower Indus basin about 5 million acres are irrigated by canals. Seven canals take off at Sukkur, the site of one of the largest barrages in the world. Three of these canals are on the left and four on the right side of the Indus. Kotri Barrage near Hariipur, 16 miles south of Kotri, is nearing completion.

1.	Upper Bari Doab Canal	1.1 m. acres in Upper Bari Doab.
2.	Lower Bari Doab Canal	1.2 m. acres in Ganga-Bari Doab.
3.	Upper Chenab Canal	Upper portion of Rechna Doab.
4.	Lower Chenab Canal	2.2 acres in Nilibar colony.
5.	Upper Jhelum Canal	200,000 acres.
6.	Lower Jhelum Canal	200,000 acres in Bahawalpur colony.

TABLE X

Irrigation Schemes	Area to be irrigated (000, acres)	Estimated Food grain Production (000, tons)	Completion Schedule
West Pakistan			
Kurram Weir	270	50	1956-57
Warsak High Level Canal	93	28	1958-59
Thal Project	1,167	343	1956-57
Taunsa Project	710	197	1957-58
Mangla Dam	3,000	..	1961-62
Merala-Ravi Link	260	21	1956-57
Ghulam Mohammad Barrage	2,750	825	1960
Gudu Barrage	2,294	666	1958-59
Makhi Dhaud Reclamation	150	..	..
Nari Bolan (Phase I)	34	85	..
Anamber Weir Project	9	..	Completed
Zargi Tangi	1	..	Completed
Extension of Sailaba Cultivation	81	81	1960
East Pakistan			
Gauges-Kabodak Project (Phase I)	250	66	1955-56
Teesta Barrage	1,000	3,500	..
Total	21,069	5,862.0	..

Canals thus constructed will irrigate large tracts of agricultural land.

In the Quetta and Kalat divisions the nature of the country and the absence of large permanent rivers have resulted in a very small irrigated acreage. The under-

ground water channels known as karez are the main source of water supply in the Daman areas. According to the recent scheme of Nari Bolan at Allah Yar Shah, an area of about 34,000 acres shall be irrigated after the completion of its Phase I.

Recently great shortage of water in the canal colonies have been felt. Extension of irrigation schemes are planned and work has started on many such projects in order to extend the irrigated area. Table X gives the various irrigation schemes scheduled to be completed in the near future.

As stated above, 58% of the cultivated acreage in West Pakistan is irrigated. Expansion of the irrigated area has not been very conspicuous since 1931. There has been only an addition of 5.2 million acres under irrigation, including .2 m. acres in East Pakistan. Most of the preliminary irrigation schemes had been completed by 1931. High percentage of irrigated land now is found in Lahore, Multan and Bahawalpur districts where more than 75% of the cultivated land is irrigated, highest being in Multan district amounting to 96%. Khairpur and Hyderabad have half of the cropped acreage irrigated. Least is in Kalat and D. I. divisions.

In the arid West Pakistan Indus and its tributaries coming down from the snow clad mountains are the greatest gift of nature. Actually the land and water are the two most important natural resources of Pakistan. The new schemes when completed will increase the food supply of Pakistan considerably.

Besides these all round efforts to increase the yields of crops, there is a vital need for reforms in the land tenure system of Pakistan when as large as 74% of the working population is engaged in agriculture.

Other Food Resources

The foregoing discussion has been mainly on the food resources directly related with the agricultural activities. There are other items of food like meat, fish, butter, ghee and milk, which, though consumed in small quantities in our country, have an important bearing on the national economy.

In Pakistan a large proportion of the area is classed as not available for cultivation and culturable waste. This amounts to 30,581 and 21,924 thousand acres respectively or 42% of the total area. Much of this area lies in the Frontier regions of Pakistan, in the hilly tracts of Kalat, Quetta, D. I. Khan and Peshawar divisions. This area serves as a pasture land generally with thin grass as a rule in the arid west. Pastoralism and the semi-nomadic life in these areas is not a matter of choice but is forced by the environments. Here it is the primary occupation and not a supplement to agricultural pursuits. In the plain areas fallow land and culturable waste is often used as pastoral land and it is a supplementary pursuit to agriculture.

Pakistan inhabits about 6 million sheep and 10 million goats. D. I. Khan, Multan, Rawalpindi and Bahawalpur divisions have about 3 million sheep, the rest are in Quetta and Kalat divisions. East Pakistan has .2 million sheep. Goats are much more numerous in the humid climate of East Pakistan. About 4 million goats are bred in East Pakistan. In West Pakistan, Khairpur, Hyderabad, Multan, Bahawalpur, Rawalpindi and Peshawar divisions have most of the goats. About less than a million are accounted for by Kalat and Quetta divisions.

Goats and sheep respectively supply about 1,107 and 538 thousand maunds of meat in Pakistan out of which East Pakistan has only 306 and 35 thousand maunds respectively. Pakistan has 24,296 thousand buffaloes and cows. Out of which a small proportion is used for beef supply. About 4,389 thousand maunds of beef and 1,038 maunds of buffalo meat are produced in the country. East Pakistan has 1,910 and 152 thousand maunds of beef and buffalo meat respectively.

Total meat production in Pakistan amounts to 7,072,000 maunds, East Pakistan shares only 2,403,000 maunds or 34% of the total production. The quality of meat is generally not very good due to lack of proper feeding and care of animals. Usually these animals are lean as no livestock is specially fattened for the purpose of meat production as is done in countries like U. K., Australia or Argentina. The area under fodder crops is very small. An all round development in the agricultural system would give a better scientific rotation of crops and more space to fodder crops which would in turn lead to better-bred livestock.

Fisheries.—As is evident from the above figures meat production in East Pakistan is very small. This deficiency is met by the abundance of fish supply from the rivers, local ponds and the sea. Pakistan has a coast line of about 850 miles, 555 miles in West Pakistan bordering the Arabian sea and about 300 miles in East Pakistan bordering the Bay of Bengal. From various scientific investigations made from time to time there are reasons to believe that Pakistan's coastal waters are rich in fish resources. Nearly all type of fish of warmer waters are to be found here, yet the production is small. According to various estimates the total fish catch in Pakistan varies a great deal from 2,146,000 to 77,000 tons. The former estimates are given by the Department of Commercial Intelligence and Statistics in the Statistical Digest of Pakistan, 1950. According to these figures East Pakistan shares more than 90% of the total fish catch of the country. According to the later estimates given by the Ministry of Food and Agriculture, the annual catch of fish in Pakistan, marine as well as fresh water, amounts to 77,000 tons out of which about 40,000 tons or 52% is shared by East Pakistan. Its coastal waters and numerous rivers and ponds are teeming with life.

Marine fish in Pakistan is mostly caught in the Bay of Bengal waters near Karachi, and a small proportion along the Mekran coast. Even in the Bay of Bengal fishing operations are mainly confined to the coastal waters. Off shore fishery resources of deeper water still remain untouched due to lack of proper equipment.

Pakistan has about 35,000 sq. miles under fresh water and East Pakistan has 90% of it. Fresh water catch comes practically from all parts of East Pakistan.

Fish forms a very important item of diet along with rice in East Pakistan. According to the statistics given above by the Ministry of Food and Agriculture the *per capita* consumption of 2 lbs. of fish in Pakistan is very poor as compared to other countries of the world. In U. K., the *per capita* consumption is 40 lbs. in U. S. A., 15 lbs. in Italy, 11 lbs. in Denmark, 24 lbs. and in India, 3.4 lbs. There are about 169,000 fishermen out of which 93,000 are engaged in Marine fishery. In East Pakistan there are 85,000 fishermen out of which 50,000 are engaged in fresh water fisheries. The yields of fish per fisherman is very poor varying from one to one and a half ton of fish per annum. This reflects on the poverty of the class of fishermen.

There are many factors that are responsible for the small catch. At present, the transport and storing facilities as well as the catch equipment both of marine and fresh-water fisheries are very inadequate. The existing means of transport by ordinary railways or boats without the cold storage facilities are inadequate. In East Pakistan there are improvised markets not of proper design and type. Even at Karachi the whole sale distribution of fresh or cured fish leaves much to be desired in the way of sanitation. In all Pakistan there are about 200 ice factories and cold storage facilities for perishables are attached only to about 22 of them with a total capacity of about 4,000 tons which is mainly used for potatoes and fruits. No cold storage exists exclusively for storing fish and no ice plant is located on any fish harbour or landing Jetty. These factors lead to the general complaint that fish is not available in all seasons to meet the local demand.

Some improvements in this connection are being made. A modern fish harbour is already under construction at Karachi and a similar harbour is planned for East Pakistan. A programme for wind-driven fishing raft is already in hand besides the training of fishermen in modern methods of fishing. Demonstration fish farms at Khulna, Jessore, Chittagong, Rajshahi, Noakhali, Chomnohani, Mymensingh and Comilla are being constructed for breeding better fish in the waters of East Pakistan which are supposed to be the richest fish breeding waters in the world after China. At the same time private capital is being encouraged for the development of the secondary phase of the industry such as processing and canning. Schemes also

exist to provide cold storage facilities near the large collecting and distributing centres in both wings of Pakistan. Fish production of Pakistan could be greatly increased by all these steps which would also tap the off-shore fisheries of Pakistan. It would not only increase the *per-capita* consumption of fish but will also produce substantial quantities of fish for export. It would in turn spare more cattle for a larger production of milk butter and ghee.

At present Pakistan shares only 1% of the total world production of fish. Japan's arge sea harvest has helped her to ease the food situation. Similarly, greater fish production would help in feeding the teeming millions of East Pakistan.

Milk production in Pakistan is quite small. There are about 5 million milk cows and buffaloes out of which only two million are in East Pakistan. The milk production in the country amounts to about 155,827 thousand maunds out of which about 18,597 thousand maunds is goat milk. About two thirds of the milk is consumed in fresh form, the rest used for making butter and ghee.

Food supply per capita and food situation

Table XI has been prepared to show the *per capita* supply of food grains, meat, milk, ghee, vegetables and fruits in Pakistan. In case of cereals if allowance be made for seeds and losses through transport and lack of proper storage, an average Pakistani is left with only about 5 maunds of cereals for the whole year.

According to the F. A. O. report of 1952, an average Pakistani has the poorest diet in the world except an Indian and a Burmese.

TABLE XI

PER CAPITA PRODUCTION OF VARIOUS ARTICLES OF FOOD IN PAKISTAN

	Food Grains Maunds per head	Meat	Fish	Ghee	Vegetables	Fruits
		Lbs per head				
East Pakistan	5.5	4.1	58	..	1	4.0
West Pakistan	5.3	10.6	.82	5.74	1.64	.82
Pakistan	5.4	7.35	29.5	3.28	82	2.46

(See graph of calories of principal food groups per person per day in several countries of the world). It shows that U. K., U. S. A. Canada have more than 3,000 calories daily *per capita*. All the Asiatic countries show a much poorer diet. The proportion of various articles of daily diet is also different in the Asiatic countries from that in the west. In countries like U. K., U. S. A., and Canada, France or Germany cereals form a small proportion of the daily diet. Roots and tubers sugar, meat, milk and fruits are consumed in considerable quantities. In the Orient, cereals constitute more than two thirds of the daily diet. An average Pakistani consumes 2 lbs.¹ of fish *per capita*, 7.35 lbs. of meat, 3.28 lbs. of fats, .82 lbs. of vegetables and about 2 lbs. of fruits *per capita* annually.

With this poor diet, maintenance of the national health is a serious problem, apart from a marginal economy. Pakistan has just enough cereals to maintain itself only in normal years, without the question of a standard diet. The food situation in the country is summed up by the export and import of food stuffs since 1947.

TABLE XII
IMPORTS AND EXPORTS OF FOOD GRAINS FOR PAKISTAN

Year	Imports (000 tons)	Exports (000 tons)
1947	14	X
1948	125	X
1949	200	X
1950	X	200
1951	X	150
1952	325	32
1953	718	78
Total	1,382	460

X = Data not available

The above figures show that so far Pakistan has not been able to meet the demand of food supply from within her resources. Situation is much more serious in East Pakistan which has never been self sufficient for its food requirements. Some imports of food stuffs is necessary even in normal years. Both the wings of Pakistan have 13% of the total area classed as culturable waste. Schemes are contemplated

¹According to the figures published by the Ministry of Food and Agriculture.

to irrigate such waste land to bring it under cultivation. Other schemes include reclamation of land which has deteriorated due to water logging, sem and thur, control of pests and plant diseases, distribution of better variety seeds, provision of storage facilities, proper manuring and facilities of better transport which is so vital for the quick and economic transport of food stuffs. Pakistan rail and road transport has improved satisfactorily since independence. There has been an addition of 975 miles of railway, the total being 5,000 miles in West and 16,000 miles in East Pakistan. Now the road mileage in Pakistan is 60,000, out of which 4,350 miles have been added since 1947. In East Pakistan river transport is developing at a fast rate.

The foregoing analysis of all the food resources of the country shows that the pressure of population is great assessing the present day returns from the land, for the increase of which efforts are being made. Hopes for increasing the *per capita* food supply is not very great as the rate of population growth is quite alarming. If the graphs for *per capita* food production and population growth remain even parallel the standard of living shall remain very low as it is. So far little attention has been paid to educate the masses in a way that the population growth may be arrested. For a sound economy the demand of food supply should not exceed the supply so that food stuffs could be exported and an upraisal of the standard of living may take place. Industrialization will gradually draw more people to the large urban centres, so that mechanization of agriculture in newly cultivated areas and a partial mechanization in the old settled parts may be brought about when each farmer may own a bigger piece of land to till. It is the race between the development of food resources of our country and the increasing numbers, and the more we leave the numbers far behind the better for the nation.

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**SOME ASPECTS OF LAND UTILISATION OF MAJHINA
NADIR PAR (P.S. RUPGANJ, SUB-DIVISION
NARAYANGANJ, DISTRICT DACCA, EAST PAKISTAN)**

BY

NAFIS AHMED

AND

FAZLE KARIM KHAN

The village presents an excellent opportunity for the study of land-use pattern in the seasonally inundated area of the Jamuna-Meghna Doab.

Location and Area

This is a small village situated 20 miles north of Narayanganj on the bank of Sitalakhya river which remains open to the motor-boats and the launches throughout the year. Mid-way between Narayanganj and Majhina Nadir Par is Demra which is not only served with navigable Sitalakhya but is also well linked with Dacca by a motorable road 10 miles long. This road is serviceable during the dry season. During the flood season (June—September) it can be reached from Dacca by boat.

The shape of the village compares with an isosceles triangle having its base running east-west on the north. The total area is about 141.65 acres of which 117.13 acres or 83% are cultivated and only 3.1 acres or a little more than 2% are cultivable waste. Of the remaining 21.42 acres, 16.6 acres are occupied by homesteads, paths, tanks and khals and the rest is reserved for grazing.

Topography

Majhina Nadir Par is a new settlement on a 'char' (tow-head) of the Lakhya river and has developed as a satellite of the main Majhina lying to its south-west. The two Majhina as were separated by a river as the suffix Nadir Par (beyond the river) signifies. The river was no other than Sitalakhya which has now moved eastward and no longer acts as a barrier between the two villages. It is said that about 150 years ago, cholera broke out in the main Majhina and took a heavy toll of life. The 'Quazi' or the quack of the village did his best to check the epidemic but all his efforts proved futile. He, thereupon, advised the terrified inhabitants to quit the village and settle on the 'char' beyond the river Sitalakhya. A good number of the villagers took refuge in the 'char' and built temporary huts. After the epidemic subsided, many returned to their old houses but some of them chose to make the new settlement their home. It was in this way that Majhina Nadir Par was first settled.

Topographically the village has the appearance of an inverted boat with its longer axis running north and south. The high ground runs through the mid-village across the whole north-south length. Its continuity is broken only in the extreme north by a khal. The high ground is about 12=15 feet above the river-level. From this relatively higher land, the land slopes eastward into the Sitalakhya river and westward into a bil. In normal flood the entire village except the higher land on which 'baris' are located goes under water. During the abnormal floods of 1954 and 1955 not an inch of land was above water and the depth of water inside the houses was nearly two feet in 1955. The villagers were living on wooden platforms built within the rooms for that purpose. Another notable feature of the flood was that unlike the other years, the water came into the area from the west and the current was towards Sitalakhya river. The eastward flow of water was noticeable even north of Dacca town. This shows that local rainfall was not of great importance in the floods of 1954 and 1955. The overflowing of the Jamuna river with its wide catchment basin extending into Assam and the Himalayas seems to be mainly responsible for the floods in this area.¹

The higher land in the middle of the village is occupied by the typical Bengal homesteads or baris. The 'baris' are in one row running parallel to the stream illustrating a linear pattern of settlement. The two flanks of the inverted boat lands are given to the production of crops while a patch of lowland is reserved for grazing.

Climate

The village enjoys a hot and humid summer and a cool and dry winter. The summer season extends from March to October when the temperature at Narayanganj only 20 miles away remains above 78°F and rises above 83°F in April and remains so till September. The maximum temperature at Narayanganj reaches 83.5°F. The winter season is of four months duration. The lowest temperature at Narayanganj is recorded in January and stands at 66.7°F. It is this moderate winter temperature which permits the growth of paddy throughout the year in the village lands.

The rainy season coincides with summer. This is a great boon for the cultivation of jute and paddy. The Nor'westers or 'Kal-Baisakhi' and the Monsoons bring rainfall. March, April and May are the months of the Nor'Westers when rain comes with thunder and lightening. Normally 17.1 inches of rainfall takes place at Narayanganj from the Nor'Westers. This is exceptionally favourable for the cultivation of Jute and Aus. The Monsoon breaks in May and continues till early October and brings 64.2 inches of rainfall. This constitute about 90% of the total precipitation and it is upon this that the Aman crop depends. The winter is almost dry only 2.5 inches of rain of a total of 72.2 inches of rainfall comes in this season.

The authors visited the locality during the unprecedented floods of 1955.

Winter rainfall is of no great importance to the agriculturists, though the winter season is noted for Boro, Rabi and Tobacco crops. No irrigation is required as the land retains sufficient moisture for the crops.

Soils

The soil is primarily of two types. Clays or 'Matials' and Loams or 'Doash'. Clays are found in one patch of 50 acres occupying the bil area in the west of the village. They become hard when dry and gluey when wet and make ploughing difficult. They are exclusively given to the production of paddy and remain fallow during the winter season. The Doash area extends over the rest of the village excluding a narrow fringe bordering the river. Doash is a mixture of clay and sand of which two thirds is clay. It is extremely fertile and easy to plough. The entire Doash area is double cropped producing jute or paddy in summer and tobacco in winter. Jute occupies the best land along the river and the khal. A narrow strip of land bordering the Lakhyhas 'Bali' or sandy soil where the water remains so high during the summer season that no crop is grown. In winter tobacco and vegetables are the principal crops. The total extent of Bali is about 7 acres.

LANDUSE FEATURES

Cropland

One hundred and seventeen acres or about 83% of the total land is cultivated. Of this paddy occupies 87.85 acres and jute 29.28 acres while rest of the crops are grown either on paddy or jute lands. Sixty-seven acres of the cultivated land are doubled cropped, where jute and paddy are grown in summer and rabi, boro and tobacco in winter. Fifty acres are single cropped where Aman is produced. Paddy is the main crop of the village. It occupies 77% of the cultivated land. The percentage is higher than the average of the Dacca District which stands at 53.4 but lower than that of the province which is 79%. All the three varieties of paddy are grown namely Aman, Aus and Boro. Aman is the main crop occupying 94.5% of the paddy land. Aus comes next with 3.5 and boro covers 2%. Aman is the major crop of the province as well but its percentage to the total cultivated land is 71. Aman is sown in April or May and harvested in November and December. Aus is sown at the end of March or early April and harvested in July. The Aus crop becomes ready for harvesting in this area a little earlier than in the eastern parts of the province. Boro is sown in December and January and harvested in April or May. For paddy cultivation the land is ploughed and harrowed before rains. Sowing begins with first rain. Weeding is done after two months and harvesting is done by sickles. Aman and Aus are sown broadcast whereas Boro is transplanted from the nurseries.

Doash soil requires 20 seers of seed for one acre of paddy and matial 37 seers. Seeds are mostly preserved by the cultivators. The yield of paddy per acre is 18 maunds to an acre which compares well with 12.4 maunds per acre for the province.

Jute is the most important cash crop and covers 24.7% of the cropped land. The percentage for the province is 10. This higher percentage of land under jute in the village is accounted for by the annual inundation of its jute fields, adequate rain by Nor'westers and the nearness of the market at Narayanganj down the river. Jute can be grown on all the Doash land but is mostly confined to the area which gets best average of silt from the annual floods. The yield varies within a short distance from the river and the 'Khal'. Wherever the yield is less than five maunds per acre jute gives place to paddy. The average yield of Jute in the village is 9 maunds per acre. Two and a half seers of seeds are required for every acre. The seeds are either preserved at home or purchased from the government stores. Jute is sown and harvested along with Aus. The land is prepared before the Nor'westers. Sowing begins with the first shower. Weeding is done after two months and thinning after three months. After harvesting, retting is done for two to three weeks in the ditches and then fibre is taken out and dried on ropes in open spots or over bari roofs or tree tops or racks. In spite of the fact that jute occupies the best land, it is subjected to manuring. This is done as jute extracts the soil, but pays high dividends because of its exhaustive nature. Of the jute grown 90 per cent is of the Desi variety (capsularis).

In winter tobacco and vegetables are grown. Mustard is an important winter crop and occupies about 12 acres of land. Pulses including lentils and grams are important and together cover about 22 acres. Mash and mung are of minor importance. The acreage of wheat and barley is negligible. They together occupy 2 acres.

Tobacco is grown for local consumption. It covers 6 acres and the total production is 30 maunds.

Among the vegetables chillies occupy an enviable position. It occupies 45 per cent of the total land under vegetables. Sweet potatoes, onions, tomatoes, potatoes, etc., are the other vegetables grown.

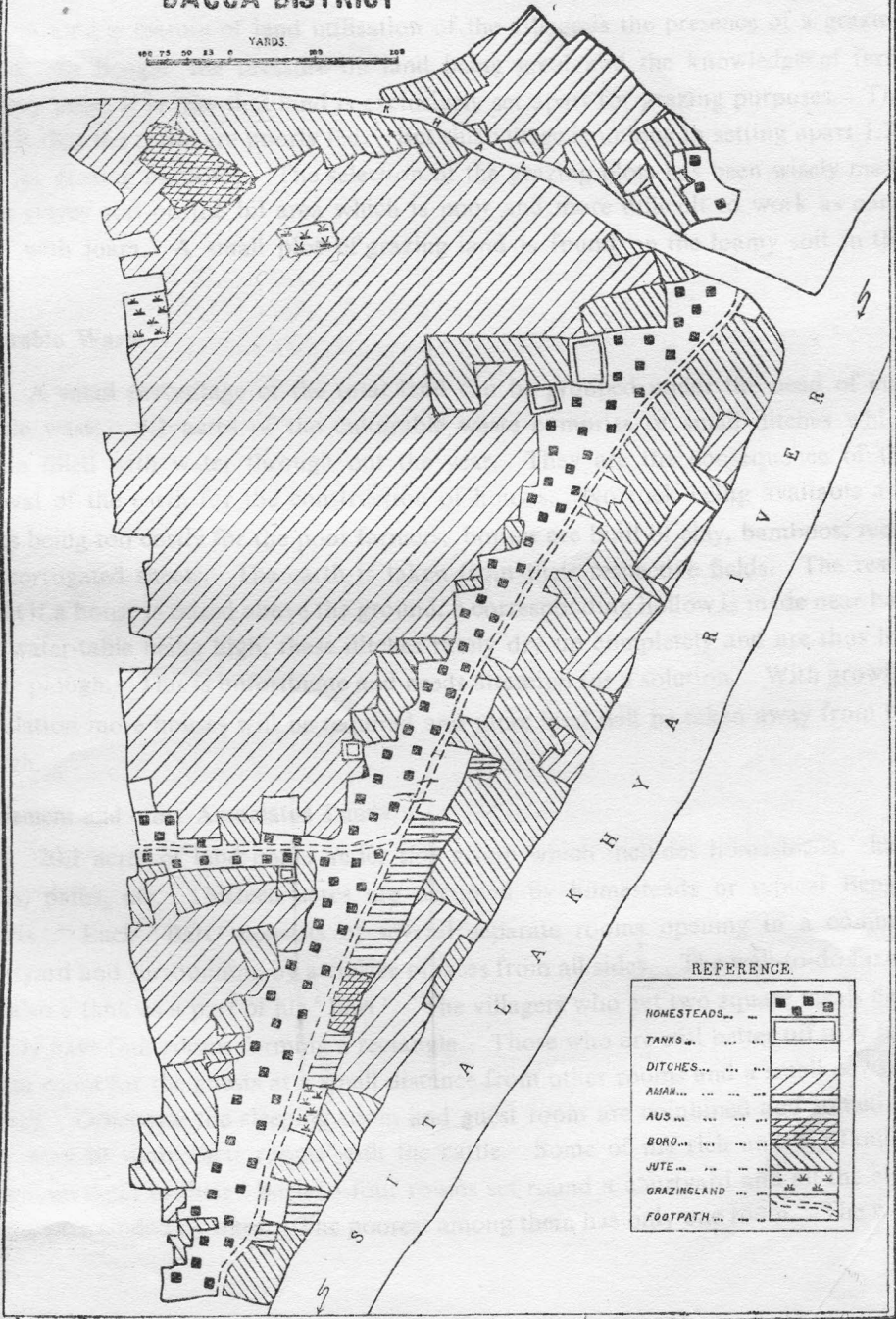
No rotation of crops is practised. The land producing paddy grows it year after year, so it is with jute, thanks to the silt brought by the Sitalakhya river. But among the rabi crops such consistency is not observed, instead changes are made from time to time though they are not in accordance with any system. The choice of crops mostly depends upon the whim of the individual farmer though the market prices have an influence on crop raising.

LAND USE

MAJHINA NADIR PAR

DACCA DISTRICT

100 75 50 25 0 YARDS. 100



REFERENCE.

HOMESTEADS...	
TANKS...	
DITCHES...	
AMAN...	
AUS...	
BORO...	
JUTE...	
GRAZINGLAND...	
FOOTPATH...	

The size of the plots is not large. The maximum size is about one acre and the minimum 0.1 acre. The average size is usually half an acre. Most of the plots have a rectangular shape. Though triangular and square ones are not uncommon. Pentagonal, hexagonal and irregular plots are rarely seen.

Grazing Land

A unique feature of land utilisation of the village is the presence of a grazing ground. In Bengal the pressure on land being great and the knowledge of farm economy poor, it is rare that land is exclusively set apart for grazing purposes. The result is that the cattle are poorly fed. But this village is unique in setting apart 1.32 acres for grazing purposes. The selection of the grazing plots has been wisely made in the clayey soil on the bil area which is poor and more difficult to work as compared with loam. A small plot of grazing land is found on the loamy soil in the south.

Culturable Waste

A small percentage of the total land can be grouped under the head of culturable waste. 3.1 acres of the culturable waste comprise of small ditches which remain filled with water through out the year. They are the consequence of the removal of the earth for the construction of houses. No rock being available and bricks being too costly for the poor farmers, houses are built of clay, bamboos, reeds and corrugated sheets. The earth is taken from their respective fields. The result is that if a house is raised above the ground, a corresponding hollow is made near bay. The water-table being high, these ditches rarely dry up completely and are thus lost to the plough. This is unfortunate and needs attention for a solution. With growing population more houses will be required and more land will be taken away from the plough.

Settlement and other Associated Lands

20.1 acres of land come under this group which includes homesteads, hals, tanks, paths, etc. Thirteen acres are occupied by homesteads or typical Bengali 'Bari'. Each 'Bari' consists of several separate rooms opening in a common courtyard and surrounding by a cluster of trees from all sides. The well-to-do farmer has also a tank as a part of his 'Bari'. The villagers who get two square meals daily usually have four rooms forming a rectangle. Those who are still better off may have a fifth room for the guests at a small distance from other rooms and a small cowshed as well. Otherwise the sleeping room and guest room are combined and sometimes they have to share their rooms with the cattle. Some of the rich and big families have even eight in their 'Bari'—four rooms set round a courtyard and all the eight rooms surrounded by trees. The poorest among them has only one room. The walls

are built of clay and bamboos and the roof of reeds. The house with a roof of corrugated sheet is a sign of prosperity and if the walls are of sheets, greater prosperity is signified. Apart from the houses, the village has three mosques, one primary school, one madrassa and one union board office. One of the mosques is constructed of bricks which is the only brick building in the village.

Majhina Nadir Par is also one of the fortunate areas in the matter of drainage. A khal has developed from Sitalakhya river which joins another khal taking off from the Babu River. This khal becomes an outlet for the rising water of Sitalakhya thereby the village is saved from the devastating floods. When the water subsides, the khal acts as a drain for the surrounding area. It occupies an area of $3\frac{1}{2}$ acres. During the winter season when a small quantity of water is left in the khal, its sloping sides are utilised for growing tobacco and vegetables.

The village has four tanks which together occupy 1.10 acres. Their usual size is 60 by 40 yards and they are rectangular in shape. The importance of the tanks may be judged from the fact that there is only one well in the village which is located in the mosque and is used by those alone who come to offer their prayers. The tanks supply the drinking water, serve as bathing pools and are used for washing clothes and cleaning utensils.

The village is not served by roads. A foot-path leads from the village along the khal southward to Demra and runs parallel to the homesteads. In the southern part of the village another foot-path comes from the Majhina village in the west and joins the first. The paths account for about three acres of land.

The village has the advantage of a favourable topography and an exceptionally fertile soil for cultivation. Only $3\frac{1}{2}$ acres may be classified as culturable waste. These are the ditches formed after the removal of earth for the construction of houses. It will perhaps be wise if the villagers throw the filth and rubbish heaps of their houses in these ditches so that they may be filled up and ultimately reclaimed for cultivation. But before this can be done some alternative source of house-building materials will have to be found. At present, the only alternative appears to be a greater use of bamboos and wood. Another way of increasing the crop land will be to fill up the tanks and turn them into cultivated fields. So many tanks appear to be quite unnecessary for the village. They are also the breeding ground of mosquitoes and store house of filth. Tube-wells should replace the tanks. They will occupy smaller areas and supply good drinking water thereby improving health and sanitation.

The land being exceptionally fertile and the climatic conditions being favourable more intensive cultivation of rabi crops can be practised. Dacca and Narayan-ganj being not very far off, vegetable growing can be more intensified and serve as good cash crops.

LAND CLASSIFICATION IN MAJHINA NADIR PAR, 1954-55

	Crop land	Grazing land	Culturable waste	Settlement and Associated. Non-agricultural land	Total
Paddy ..	87.85	..	..	..	87.85
Jute ...	29.28	..	..	..	29.28
Pasture ..	..	1.32	..	..	1.32
Ditches ..	..	..	3.1	..	3.1
Baris ..	..	..	..	13	13
Khal ..	..	..	..	3.5	3.5
Tank ..	..	..	..	1.1	1.1
Path ..	..	..	..	2.5	2.5
GRAND TOTAL ..	117.13	1.32	3.1	20.1	141.65

BOOK REVIEW

VORDER INDIEN

BY

LUDWIG ALSDORF

(Geography of Bharat-Pakistan-Ceylon)

The succession states of the British Indian Empire—Bharat and Pakistan—have evoked a great interest in the modern geographers. Oft and on, we have been seeing books on geography of these two countries in English. Now a book in German by a German scholar.

The book is on a grand scale and is sustained by high qualities of sincerity and mental industries. With a keener cutting edge, Ludwig Alsdorf has touched subjects, which rarely appear in an average regional geography book.

Weaving a pattern peculiar to himself, the author deals with the history, cultural background, climatic conditions, geological upheavals, population problems and racial mixture of the subcontinent.

Starting with the political history from 1857, the author comes to separate electorate and weightage and through the Radcliffe Award he comes to the historical surgery—severing of links and limbs, the Caesarian birth of Pakistan. He has not failed to discuss the Junagarh tangle and the fatal decision of the Sadri-Riyasat of Kashmir. It is refreshing to read in a geography book like this, a few paragraphs on the Community Projects of India, the “Bhudan” movement of Vinobha Bhave and the Village Aid Programme of Pakistan and India. Although one may agree or not with Guywint, who in his “Spotlight on Asia” has mentioned Bhave as one of the greatest men of Asia of 1955, one has to say that Bhave has done some work regarding land reforms in India.

Perhaps this is the only general geography book on Indo-Pakistan subcontinent, which has devoted some space to the study of the aboriginals and tribesmen. Now, the old method of describing races of the subcontinent by linguistic terms like Kolarian and Dravidian has been superseded, though no other method of somatic classification has won general acceptance. The author could have followed the work of Von Eickstedt, who divides the people of the subcontinent into three groups :

I Weddid group—

- | | |
|---------------------------|--------------------|
| 1. Gondid race | } Ancient-Indians, |
| 1. Malid sub-race | |

II Melanid group—

- | | | | | |
|-------------------|----|----|----|------------------|
| 3. Melanid race | .. | .. | .. | } Black Indians. |
| 4. Kalid sub-race | .. | .. | .. | |

III Indid group—

- | | | | | |
|-------------------------|----|----|----|----------------|
| 5. Indid race | .. | .. | .. | } New Indians. |
| 6. North-Indid sub-race | .. | .. | .. | |

It is strange that the author, who has referred to the standard works of anthropologists like Verrier Elwin, has not been able to follow a clear cut line. In fact, a detailed chapter on "anthropology" would have enhanced the value of this book.

The author is not at all foggy about the language problems of the subcontinent. His discussion and the treatment of the unilingual regions show that he had anticipated the new Indian map, as redrawn by the Indian States Reorganization Commission, which has recently brought about drastic changes in the states' boundaries. These regions have been treated in the book as territorial units for a detailed study of the geography of the subcontinent. A geographer will have to be a little cautious before he accepts this approach of the author. The main defect is that the author has treated Pakistan and Bharat as a whole and has taken up the unilingual regions, as would have existed before the independence.

The economy of the two countries has been covered in about 50 pages. Analysing the important multi-purpose projects, industrial undertakings and non-devaluation decision of Pakistan in 1949, the author comes to the vital economic disputes between the two countries, like the question of evacuee property and the canal water disputes. On the whole, this is a useful chapter.

All the available statistics have been piled up in the end of the book, where one also realises that the author has certainly kept himself abreast with all the recent articles and works in the subcontinent. In the bibliography, the author has somehow attributed an article on "Climatic Regions of East Pakistan" to the reviewer who did not write it.

Summing up, it is an unusual geography book, which can be read with interest even by a non-geographer, without being initiated into the technicalities of the subject.

THE OXFORD ECONOMIC ATLAS FOR PAKISTAN

The Oxford Economic Atlas for Pakistan, Oxford University Press, 1955, is a welcome publication for the students of geography and economics. It contains 97 pages of maps and graphs. The setup of the atlas, its colour scheme, and printing are attractive. The maps and graphs are of high illustrative and informative value. The data illustrated are of a wide range and cover almost all the important items which can be usefully illustrated in an atlas. The comparative bar diagrams of the several categories of data for the pre-war and post-war years give a vivid impression of the variations in these data during the recent years.

The atlas begins with a set of tables containing useful general economic information about Pakistan. Some of the facts about Pakistan are compared with those of some other countries of the world. The appendix at the end of the atlas gives the states and provinces, with their districts, of Pakistan, Ceylon and India.

In spite of the visible merits of the atlas it is not free from omissions and even mistakes some of which are noted below :—

- (1) In the map of natural vegetation of the world on page 3 a major proportion of the area of West Pakistan is, contrary to facts, included in the plantless hot desert type. Most of this area is in no case more arid or devoid of vegetation than the desert of Arizona or the Arabian coastal land which are classed as hot desert with arid desert shrub.
- (2) In the political and population map of the world on page 7 some of the international boundaries, particularly of the East European Countries, are inconspicuous. The red dots showing the distribution of population have not come out well in the Commonwealth countries which are also coloured red in the map. The Choice of the value of the dot is not very appropriate. One dot represents 500,000 persons. It has resulted in showing as empty large parts of Australia and Canada which are otherwise populated.
- (3) A number of the important hydel works of Pakistan are not shown on the mineral and power map of Indo-Pakistan (page 37). Similarly Sui Gas, an important source of power in West Pakistan, is ignored.

- (4) Indo-Kashmir boundary is omitted in maps on pages 38-39 and 41. Tea plantations of East Pakistan are not shown on the land use map of Monsoon Asia on pages 38-39.
- (5) In the irrigation map of Indo-Pakistan (page 40) large irrigated areas of Punjab, for example Lyallpur, Multan and Montgomery districts, are not shown as irrigated land.
- (6) The world map showing agricultural areas (page 42) is defective in a number of respects : (a) The shade showing intensive oriental farming is drawn over most of Indo-Pakistan. In fact most of the Deccan plateau has no intensive oriental farming as it is in China or Japan. The same is true of Indo-China block shown under that shade. (b) Parts of West Pakistan under irrigation are not shown as such (c) Dry pastures have not been shown at all. In South-West Asia much of the land in Iran, Iraq and adjacent areas forms dry natural pastures. (d) Commercial mixed farming zone is librally marked in Asia Minor. In fact there is hardly any mixed farming in areas around Armenian knot and Kurdistan in north-western Iran and northern Iraq. In these areas the occupation of the people is rearing of sheep and goats. (e) The map is, in parts, in contradiction to that of the land-use in Monsoon Asia (pages 38-39). A number of the areas shown under plantation agriculture in map on page 42 are not shown as arable in the map on pages 38-39.

The choice of some of the terms, for example 'intensive oriental farming' and 'simple tropical farming,' in the index of some maps is not a happy one. These terms are not well defined or widely accepted. The usefulness of the maps of Indo-Pakistan might have increased had Pakistan and India been shown separately on larger scales.

M. K. E.