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URBAN POPULATION IN PAKISTAN

BY

Prof. Kazi S. AHMAD

(One of the outstanding features of our modern society is the urbanisation of population and the growth of urban centres on an increasing scale. Our culture both in the orient and the occident particularly in the latter, is getting more and more city-minded. In the countries of Western Europe and in the United States the entire social environment partakes predominantly of urban ways. The urban community, meaning agglomeration of people living in close proximity to one another in permanent compact settlements, is by no means a purely modern development. (There have been large urban Communities both in early and medieval times.) Sumeria and Egypt had many cities more than 5000 years ago. (Mohenjo Daro Harappa and Taxila in our own country remind us of cities of ancient times. Hellenic and Roman cities were well-organised. With the dismemberment of the Roman empire there was also a disintegration of Urban life. There were, however, Cathedral, fortress and garrison towns. New towns also grew as trade centres trade routes developed.

✓ In modern times Urban communities have developed as a consequence of development of commerce and industry. As a matter of fact without trade and commerce no towns or cities could come into existence for they presuppose a non-agricultural population which buys its food supply. This must come from within the country itself or from abroad. It implies a good system of transport and ability to purchase food by the sale of manufactures.

In the west the movement towards the town has been mainly due to two causes—(1) Science and the application of new methods of cultivation enabled a large production of food from the same land, making a portion of the rural population surplus to go to towns to find opportunities for employment as in U.S.A. (2) Growth of commerce and industry in the towns and cities offered better opportunities of employment and many people left the land even if they had to purchase their food as in the case of Britain. There the prosperity resulting from increased occupation in commerce and in industry also converted many old rural settlements into towns. In our country townward drift is to a great extent the consequence of poor economic conditions in the rural area and lack of opportunities to earn even for a bare living. Excessive pressure on land has

resulted in the prevalence of an enormous amount of poverty forcing the people towards the town for their very existence. In other words the movement to the town has been mainly due to a push towards it by adversity at home rather than a pull towards it by the prospects of relative prosperity. The extent of movement to the town or city corresponds to the general state of harvests. And in the case of many people it is only temporary and so the census figures may not really give the degree of Urbanisation. Some towns and cities include large areas which are on the face of it quite rural as in Lahore. In other cases suburbs which are really urban in character have been excluded as in Karachi. Another difficulty is the rigid system of marking the boundaries of towns and cities. Official boundaries of municipalities, Corporations and Cantonments were fixed long ago as of historical causes or in some arbitrary way and do not take into consideration the economic and social conditions that have taken place in later times. So also do we find that many people, though belonging to the same city have taken their abode and established factories just outside the municipal limits to avoid certain taxes. Though urban in reality this occupancy is not reflected in the urban population.

The following table gives the actual and percentage of the urban population by provinces and states.

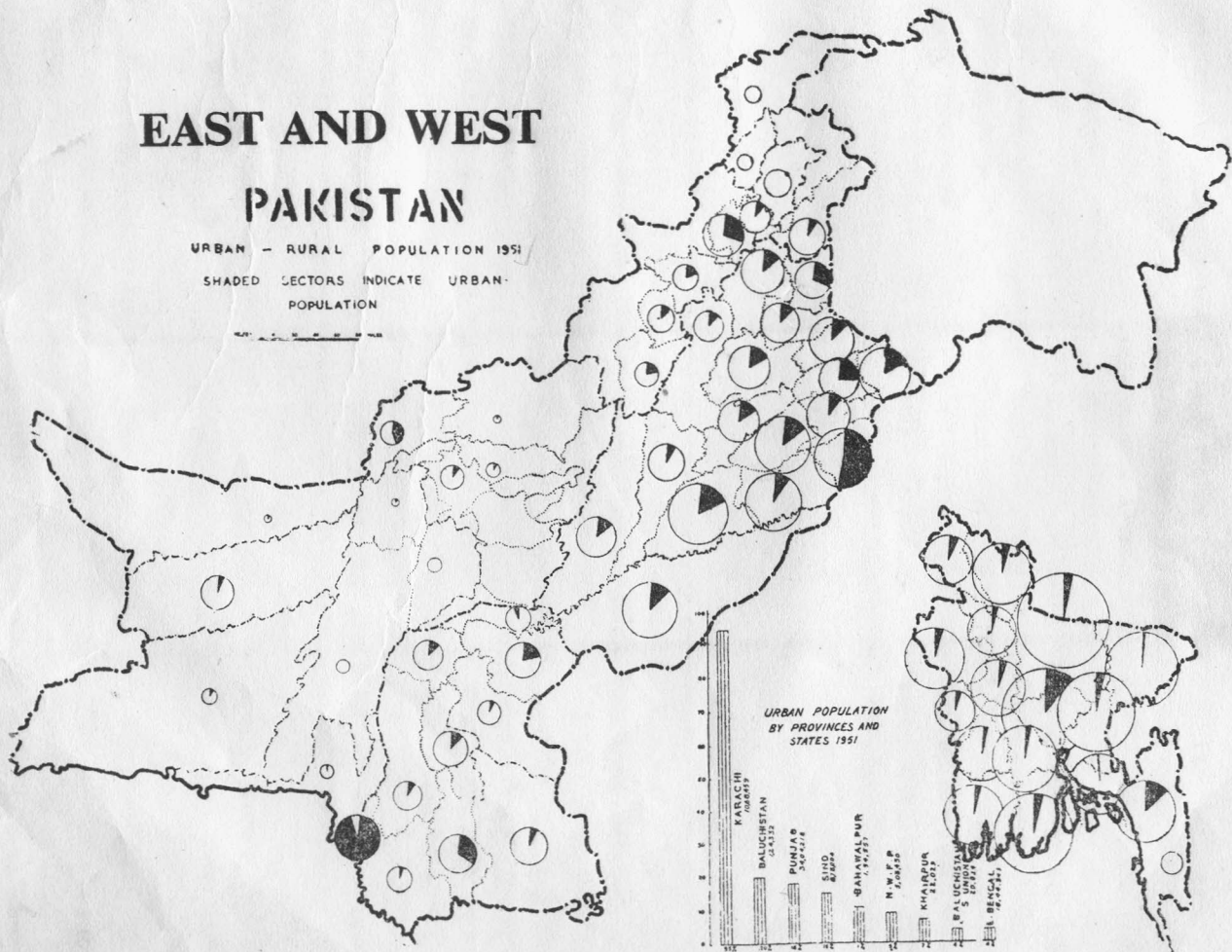
Table I. Urban Population and its percentages to the Total population.

<i>Provinces and States</i>	<i>Total Population</i>	<i>Urban Population</i>	<i>Urban Population as % of total.</i>
Pakistan	7,58,42	78,63	10.36
Baluchistan and States Union	11,74	1,45	12.35
Districts	6,22	1,24	19.93
States Union	5,52	21	3.80
East Bengal	4,20,63	18,44	4.38
Federal capital area Karachi	11,26	10,68	94.84
NWFP and Frontier regions	59,00	5,06	8.57
Districts	32,53	5,06	15.55
Frontier regions :	26,47	...	...
Punjab and Bahawalpur State	2,06,51	35,99	17.42
Districts	1,88,28	34,04	18.07
Bahawalpur State	18,23	1,95	10.60
Sind and Khairpur State	49,28	7,00	14.20
Districts	46,08	6,78	14.71
Khairpur State	3,20	22	6.87

EAST AND WEST PAKISTAN

URBAN - RURAL POPULATION 1951

SHADED SECTORS INDICATE URBAN-
POPULATION



Apart from the federal capital area of Karachi which is a big conurbation with an urban population of 95% the districts of Baluchistan and Punjab show the highest percentage. In the former it is due to the existence of a big urban centre in an otherwise thinly populated area. This is in marked contrast to the States Union where the urban population is only 3.8% one of the lowest in Pakistan. In the latter the high percentage is due to the existence of a large number of towns of various classes and 6 out of the 12 cities of Pakistan.

The urban population of Pakistan is very low as compared to that of many western countries and United States as shown in the following table:

Table 2. Percentage of Urban Population of highly urbanised countries.

Country	Percentage of Urban Population	Countries	Percentage of Urban Population
Scotland ...	82.9	Hawaii	69.0
England and Wales ...	80.7	Australia	68.9
Israel ...	77.5	United States	63.7
Federal Republic			
GERMANY ...	71.1	Belgium	62.7

It shows that in U.S.A. where the food is grown at home two persons in the rural area can produce food not only for themselves but, with the help of scientific cultivation, for three others living in the town, excluding what is available for export. In Britain where the land failed to support the growing population, persons who could not be gainfully employed in agriculture took to commerce and industry. They migrated to the old cities or the new ones which grew as a result of the growth of commerce and industry.

✓ In Pakistan the Urban population is 10%—18% in the West and only 4% in the East. Depending on own resources it means that in the west a peasant family of about 4 persons produces a surplus above its own requirements enough to provide one town dweller only.

In the east a group of 96 persons produces food for 100 persons and considering the shortage even less than that. The latter points to the great degree of the self-sufficing economy of the people of the Eastern wing and to a very small development of commerce and industry.

This difference, however, narrows down very much if we take into account persons actually employed in agricultural labour, separated from their dependents. In West Pakistan agricultural labour constitutes 20.1 p.c. of the total population against 25% in East Pakistan. Accordingly each labourer in West Pakistan produces food for 5 while in the East he does it for four persons. About one out of the five of these lives in a town in West Pakistan. With increase in the yield per acre by intensive farming or extension in the cultivated acreage by irrigation, dry farming or other improved methods of cultivation and the development of industry and commerce resulting from it there is bound to be a further increase in the Urban population. If agricultural efficiency in West Pakistan increases until three peasants can produce food for four, urban population will increase to 25%. Any higher increase in urban population is difficult to foresee unless there is a general improvement in the standard of living or the limit of urbanisation is reduced to 20000 or 25000 persons as is the case in other more advanced urbanised countries.

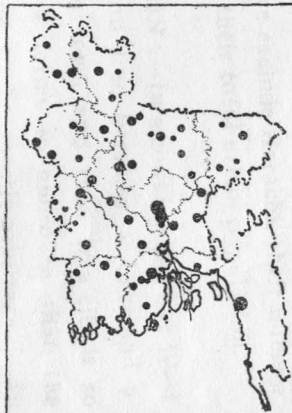
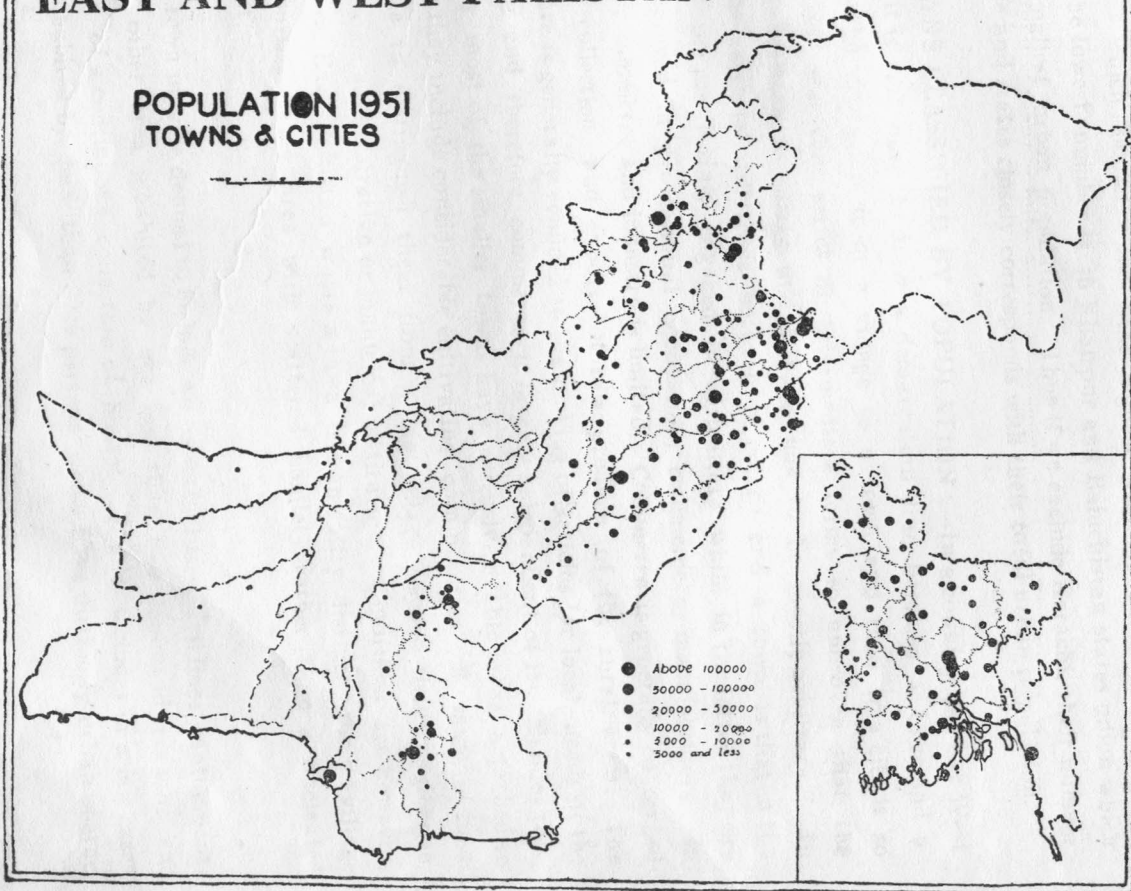
✓ In East Pakistan, however, on account of very high density of rural population very little surplus is left for a town dweller and that too inspite of the fact that rice, the yields of which per acre are so high, is their food crop. Under the circumstances, combined with their scattered hamlets, there is little prospect of any great Urbanisation in that wing.

✓ The distribution of the urban population in relation to the total and rural is shown in the map. The highest percentage of urban population is found in (1) districts which contain cities, for example Karachi (95%), Lahore (51.75%), Hyderabad (32.64%) Rawalpindi (29.14%), Gujranwala (23.97%) and Multan (16.19%) in West Pakistan. Similarly Dacca and Chittagong show the highest percentage of urban population in East Pakistan 10.22 and 12.94 respectively, (2) Districts which contain other greater towns like Sargodha and Sukkur, (3) districts which contain large contonments like Kohat and (4) districts which contain large numbers of refugee immigrants who have settled in towns as in Jhang. It may be due to more than one of these causes. The Hyderabad district in Sind shows a higher urban percentage next to Karachi and Lahore only, because of the city of Hyderabad which contains a very large number of Mohajirs.

✓ On the other extreme Sylhet, Faridpur and Jessore in East Bengal show the lowest percentage of Urban population in East Pakistan, 1.05%, 2.1%, 2.2% respectively. Each of these has only 3 or 4 small municipalities. The lowest percentage in West Pakistan is in Tatta district (3.21%), Las Bela (4.04) and Kharan (4.74). It is interesting to note that these urban percentages are higher

EAST AND WEST PAKISTAN

POPULATION 1951
TOWNS & CITIES



then the lowest percentage in East Bengal districts inspite of the great hostility of environment.

The distribution of urban settlements is shown in the map. The largest number of them in each category of town is found in Punjab which has the highest Urban population in Pakistan. The next highest number is found in the East Bengal which has also the next highest urban population. Excluding Karachi, the lowest number is in Khairpur and Baluchistan states union which have the smallest urban population. Thus if we exclude Karachi, their number by province and states closely corresponds with their total urban population.

TOWNS CLASSIFIED BY POPULATION :—In a country like our West Pakistan, it is not easy to draw a demarcation line between a town and a village. "The gradation from a village to a town and then to a city is so imperceptible and the series of intermediate forms so unbroken that the distinction between a village and a town has to be mostly arbitrary." In general the essential difference between a village and a town is that in the former people are *mainly* engaged in agriculture while in the latter they are *mostly* employed in professional occupation, commerce or manufacturers. In our country commerce and industry is limited. Commerce is generally concerned with the collection and export of raw produce of the rural areas. The manufacture is generally confined to the making of articles for local needs of the population and therefore commerce is largely independent of it. Besides this, practically most of the smaller towns have extensive arable areas attached to them and they include considerable cultivating communities. So many of them have little to distinguish them from a big village beyond their large size, a bazaar some administrative or municipal institution. Conditions are however, different in East Pakistan where a town has an entity distinct from a village which consists of an area with scattered hamlets rather than a nucleated settlement.

A town may be defined to include all municipalities, civil lines, cantonments and any other area inhabited by not less than five thousand persons and consisting of a continuous collection of houses. It also includes in a few cases, places inhabited by less than 5000 persons which have distinctly urban characteristics.¹

The following table gives the number by provinces and states of each class of towns.

Table 3. Classification of towns.

Provinces or State	No. of towns and cities by Categories					
	5,000 or less	5,000—10,000	10,000—20,000	20,000—50,000	50,000—1,00,000	1,00,000 & above
Baluchistan Distt. ...	5	2	1	1	1	...
Baluchistan states union...	6	1	...	...	...	...
East Bengal ...	7	16	16	21	3	2
N.W.F.P. ...	2	10	3	7	...	1
Punjab ...	19	49	31	13	4	6
Bahawalpur ...	11	5	4	1	...	...
Sind ...	2	10	6	6	1	1
Khairpur ...	1	...	1	...	...	...
Federal capital area ...						1
Total ...	53	83	62	49	9	11

In most of the countries including Great Britain, the minimum population for urban classification is 2,000, in U.S.A. it is 2,500. It varies from 500 in Iceland to 20,000 in Neitherlands and 24,000 in Japan.

A city implies an urban centre containing not less than 1,00,000 persons or any other towns treated as a city for census purpose.

The following table gives the total urban population in various categories of towns and its percentage to the total urban population.

Table 3. Urban population, 1951, (in thousands).

Table population in each Category of towns and its percentage to the total Urban Population.

Provinces or States Total Urban Population	5,000 or less	5,000— 10,000	10,000— 20,000	20,000— 50,000	50,000— 1,00,000	1,00,000 and over
Punjab 3404.2 ...	73.1 2.2%	371.9 10.1%	410.5 12.1%	482.4 14.1%	542.0 16.2%	1524.3 45.3%
Bahawalpur State 194.5 ...	35.2 18.0%	30.2 15.0%	66.8 34.5%	62.0 32.5%	...	...
Karachi 1126.4 ...	59.0 5.7%	...	...	...	...	1009.4 94.3%
N.W.F.P. 506.4 ...	5.6 1%	86.8 13.6%	40.4 8.7	236.6 46.7%	...	151.7 30.0%
Sind 678.0 ...	3.8 0.5%	77.2 11.0%	79.8 11.5%	197.3 29.0%	77.0 11.0%	241.8 37.0%
Khairpur 22.0 ...	3.8 17%	...	18.2 83%	...	...	...
Baluchistan 124.3 ...	14.8 11.5%	13.1 10.5%	11.8 10%	...	84.3 68%	...
Baluchistan States Union 20.9 ...	14.6 70%	6.3 30%	...	...	...	...
Total for West Pakistan 6018.7 ...	150.9 2.0	567.5 9.0%	627.5 14.0%	978.3 15.0%	820.2 12.5%	2927.3 47.5%
East Bengal 1844.3 ...	25.5 1.0%	110.9 5.0%	232.9 13.0%	617.9 33.0%	151.8 8.0%	706.2 40.0%
Total for PAKISTAN 7,863.0	176.4 2%	678.4 8%	860.4 10%	1596.2 23%	972.0 12%	3633.5 45%

1. Prepared from Censes bulletin of Pakistan 1951, No. 3.

2. Category only provisional, separate census for small towns and cantonments not available.

The distribution of various categories of towns and cities is shown in Map No. 3 and the percentage of Urban population in each category of towns is shown in Map 4. It will be seen that the largest number of towns belong to the smaller medium size 5000-20000. Almost 50% of the urban population lives in the 12 cities and of the remaining population over 40% lives in these smaller medium towns. This is in accordance with what we should expect from an agricultural country like Pakistan. The main function of the towns has been the disposal of the agricultural produce. Maudi or market towns should therefore be the commonest of all. They also serve to a limited extent, as the centre of local trade. When commerce is chiefly confined between a town and the surrounding country, such towns would not attain large dimensions. The possibilities of growth are limited by the extent of the agricultural hinterland which they control and the value of trade that can be transmitted in the area. Some of these towns are also administrative centres, being headquarters of the sub-divisions or *talukas*.

The towns in the categories with population higher than 20 thousand are mostly bigger administrative centres like district or divisional headquarters, with varying amount of commerce and trade. The size of these towns varies with the productive capacity of the region, their relation to transportation, and nodality of the position all of which have their bearing on trade. The small towns (under 10000) are found in less progressive and productive areas, away from main line of communication or in thinly populated regions.

✓ In *Baluchistan* which is our largest province we have the fewest number of towns and only one city. There are only 16 towns in an area of 134002 sq. miles which gives an average of one town for every 8375 sq. miles. The total urban population is 145,256 which includes 84000 persons of Quetta alone. The towns are very small, eleven of the 16 towns have population of less than 5000. This is obviously due to the hard conditions of life and the hostility of the physical environment. The size of a town, amongst other factors, depends very much on the general density of the country and the physical resources. The total population is not large enough to maintain large towns at all and the local resources both in food and means of transport are limited. The towns are either garrison towns like Loralai, Chaman, and Fort Sandeman or administrative centres like Nushki or Sibi or capital of states. Some of them like Mastong or Las Bela are merely a collection of hamlets with the addition of a local bazar. Sibi next to Quetta has only 11842 persons.

In *N.W.F.P.* there are 22 towns and one city. The urban population is 506450 or 16% of the total population¹. This percentage is reduced to less

1. Excluding Frontier Regions for which figures are not available.

than 7 if we exclude 111903, the population of the Cantonments which comes mostly from outside the province. "To the vast majority of the inhabitants of the N.W.F.P. town life presents few attractions. The link with the agriculturist and the rural population in the tribal people is a strong one and no general inclination towards the settled conditions of life has yet begun to develop¹".

Outside Peshawar the Urban population is mainly concentrated in two categories of towns 5000-10000 and 20-5000. The latter carry 64% of the urban population. All of them except Charsaddah are Contonments, including Bannu, Dera Ismail Khan, Abbottabad, Kohat, Mardan and Nowshera. The smaller category of towns includes mostly the headquarters of the sub-divisions.

Punjab has the largest number in each category of towns. They cover 596 sq. miles which represents 44 p.c. of the the total urban area of Pakistan. There are 116 towns and six cities. The urban population is 34,04,268 which is over 43% of the total population. Seventy of the towns have population from 5000 to 20000. Until 1911 the tendency of the bulk of the population, when the economy of the province was mainly agrarian, was to reside in smaller towns and towns with 5000 to 10000 were most popular, which served as market towns for rural localities. Later with the growth of commerce and industry there developed the tendency to live in larger towns and some of the older smaller towns also grew into higher categories. A large number of them are administrative headquarters of sub-division and districts or are commercial and manufacturing centres. The six cities carry more than 50% of the total urban population of the province.

Bahawalpur still retains the rural, influence in most of its towns. More than 50 p.c. of the towns have a population less than 5000. Some industrial towns like Khanpur Rahimyarkhan are developing along the railway line. The whole urban set-up in the state shows a prominently linear pattern, stretched along the railway in the irrigated tract.

In *Sind* there are 25 towns and one city with an urban population of 678006. It constitutes 15% of the total population. Here the urban population is mostly concentrated in lower and medium sized towns from 5000 to 50000. There are only two towns with less than 50000. Practically all the towns are located on either side of the Indus in the agricultural area

1- Cezsus N.W.F.P. 1931, Report, p. 43.

controlled by the canals, along the railway lines. They are not merely marketing centres but have also developed commercially. Sukkur and Rohri are developing as town manufacturing centres and have been considerably supported by their sites on the Sukkur barrage.

Khairpur has only two towns. The capital itself has a population of only 18186.

East Bengal though containing the largest population is the least urbanised of the provinces. Its urban population is only 4%, spread over only 63 towns and 2 cities. There are several reasons for this low percentage. Firstly the people of Bengal by nature do not like town life. They prefer to live near their fields. Secondly, the Bengalis do not live in nucleated villages as are found in this western wing. So there is no question of their growing into towns. Thirdly the physical environment, inundation of large areas in the rainy season, limits the development of quick transport and commerce.

Of the 63 towns the largest number belongs to the category, 20-50 thousand, and a greater portion of the urban population lives in these towns than in those of any other category. The two cities have 45% of the urban population.

Towns in East Pakistan are generally located at nodal points with good communications to the surrounding area not only for the convenience of commerce but also administration. They command a large area, as smaller towns are difficult to grow.

Thus in this province two distinct classes of towns have been recognised.

1. Country towns. They are only of local importance in trade, linked with and serving the country around. They include most of the headquarters of the districts and sub-divisions and places old in history e.g. Barisal, Rangpur, Brahmanbaria, and (2) Industrial and commercial towns. They have sprung up as the home of industry and commerce, rail or road junctions or river ports. e.g. Narayanganj, Saidpur, Mymensingh and Chandpur.

Density of Cities :—In all there are twelve cities in Pakistan of which Quetta has a population of only 84000 persons. In between them they contain 39,36,000 persons which is 50% of the total urban population. This makes the urban concentration rather top heavy and brings into relief the wide divergence of life in different urban areas.

CITIES OF PAKISTAN DENSITY

1951

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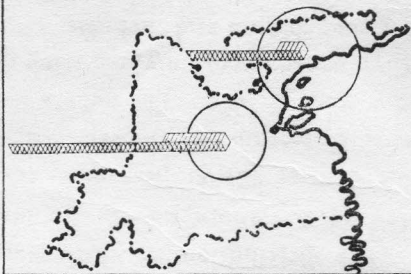
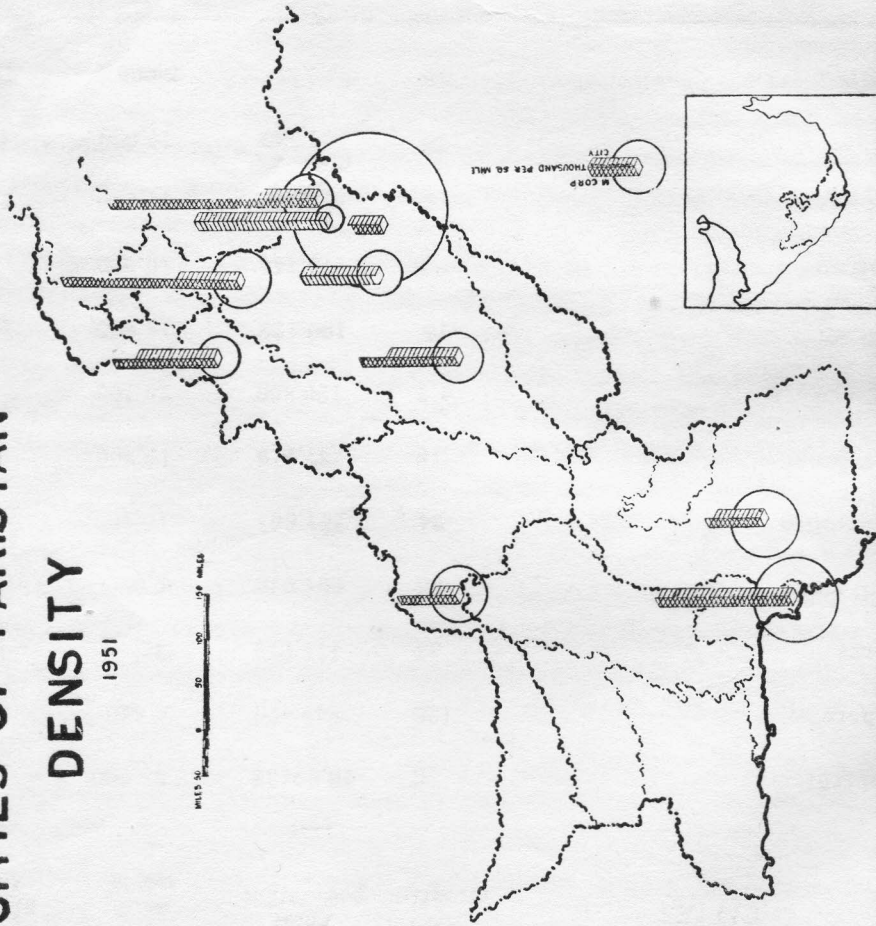


TABLE 4. CITIES

CITIES	Area sq. miles	Total population	Density as a whole	Density of muni. Corp'n.
Karachi	36	10,09438	28,000	28,799
Lahore	128	849,476	6,640	5,995
Dacca	33	411,279	12,600	46,005
Chittagong	58	294,046	5,070	24,296
Hyderabad	24	241,801	10,100	12,090
Rawlpindi	18	237,219	13,200	38,267
Gujranwala	4.3	120,860	28,100	...
Multan	13	190,122	14,600	20,636
Lyallpur	11	179,144	16,300	...
Peshawar	9	151,776	17,000	21,943
Sialkot	14	167,543	12,000	45,130
Quetta	17	84,343	5,000	11,250

The distribution of cities and size and density of population are shown in Map No. 5. Lahore covers the largest area, 128 sq. miles while Gujranwala highest density 281,00 persons to the sq. mile. Karachi has a density of 28,000 persons. Unfortunately the census figures for both Karachi and Lahore do not give a correct picture. The figures for Karachi are for the Municipal Corporation and Civil cantonment only, covering an area of 36 sq. miles. As matter of fact it is a big conurbation and includes other cantonments which cover an area of 194 sq. miles and may be rightly said to extend to its industrial area Landhi. In the case of Lahore a very large suburb has been included, a large part of which is not urban in character. This brings down the density to 6640 to the sq. miles. Even the corporation area contains large arable and unbuilt land. Within the

walled city however, the density is almost 150,000 to the sq. mile. Where the municipalities do not include large suburban and agricultural areas we get such high densities as 46,005 in Dacca and 45,130 in Sialkot. Quetta and Chittagong have the lowest density for a city. Both these cities are located in regions where the general density is low.

An examination of the map reveals that the density of cities varies with (1) the brick and mortar and the suburban area included, (2) the density of the surrounding area, (3) the extent and the type of the hinterland and (4) the stage of industrialization.

SEX RATIO: The male population exceeds the females in every province and state. There are 1,128 males for every 1,000 females in Pakistan. The ratio is much higher for the urban population in which case it rises to 1334 for each thousand of females. This is one of the highest in the world for an urban population. The main cause of this low ratio is the existence of a large number of labourers and other professional workers who come to the town leaving their families in villages. There is a great difference in the standard of living between the rural and urban areas. Family life in a town is expensive, all the more so in a city. And accommodation in urban areas is very limited. The ratio of males reaches the highest in cantonments, Abbottabad Cantonment shows highest male ratio for a town in Pakistan 4,697 males for every 1,000 females.

Comparing the two wings there are 1291 males for every 1,000 females in West Pakistan against 1,507 for every 1,000 females in urban East Pakistan. The higher percentage in East Pakistan may be due to the greater averseness of the Bengali to town life on account of which a larger number of them keep their families at home in villages. Secondly in West Pakistan the Muhajirs who have settled in towns have brought their families with them.

The ratio of males to females in urban areas by provinces is shown in diagram 1. It is the highest in Baluchistan.

TABLE. 5

Relation of males and females (Urban)

<i>Province or states</i>	<i>Males</i>	<i>Females</i>	<i>Males per thousand females</i>
Pakistan	... 4,494	3,370	1,334
Baluchistan and States Union	... 91	54	1,685
Districts	... 80	44	1,818
States Union	... 11	10	1,100
East Bengal	... 1,109	736	1,507
F. C. Area Karachi	... 614	454	1,352
N.W.F.P. and Frontier regions			
Dists.	... 295	211	1,400
Punjab and Bahawalpur States	... 1,996	1,602	1,246
Districts	... 1,887	1,517	1,231
Bahawalpur State	... 109	85	1,282
Sind and Khairpur State	... 387	313	1,237
Districts	... 375	303	1,238
Khairpur States	... 13	9	1,444

Excess of males over females is an oriental or Africo-Asian characteristic. Here basic cultural differences cause from village to city migration to be predominantly male who practically bears the entire economic burden. In the west the position is reversed *i.e.* females exceed the males. Here the movement to the city is to a greater extent female, who wants to have independent living.

COMMUNITY RATIO: Figures of the urban population by community for 1951 are not so far available. But on the basis of 1911 and earlier censuses it may be said as a general proposition that minorities are proportionately more numerous in towns and cities than in the country. The 1951 census should reveal a further strengthening of this tendency after the partition on account of comparatively greater safety and confidence offered by the urban centres. In

West Pakistan very few people belonging to the minority communities have remained in the rural area. In East Pakistan a large number of Hindus have moved into the towns since 1947. The proportion of each community living in towns is determined mainly by occupation e.g. service in the case of Christians and industry in the case of Hindus and Parsis. About all the Parsis in this country live in Karachi and proportionately a higher percentage of the Hindu population now left in Bengal is living in urban areas. Almost all the Hindus and all the Sikhs have left West Pakistan and the few Hindus that are left are living in towns or cities.

MOHAJIR RATIO : The percentage of Mohajir population in the urban areas is given in map No. 6. It covers cities and only those towns the population of which is given in the census of 1951. Those urban settlements where there are no mohajirs have been left out in this map.

The new prosperous towns and cities of fertile irrigated tracts with a dense net of communications show a much higher percentage:

Even in Baluchistan and N.W.F.P. the percentage of Mohajir population to the total population in Peshawar and other towns is much higher than that of the province as a whole. In Quetta the percentage of Mohajir population is 22.42. The town of Dera Ismail Khan in N.W.F.P. has a mohajir population 17.29 p.c. *Bannu* and Abbottabad each have had more than 12 p.c. Peshawar 9.4 p.c. Kohat and Mardan more than 4 p.c. each. The percentage of the Mohajirs in these towns is now much less than the percentage of non-muslim in the pre-partition days. A good proportion of the houses here (of Evacuee non-muslims) have either been damaged so as to become uninhabitable or have been occupied by the local population.

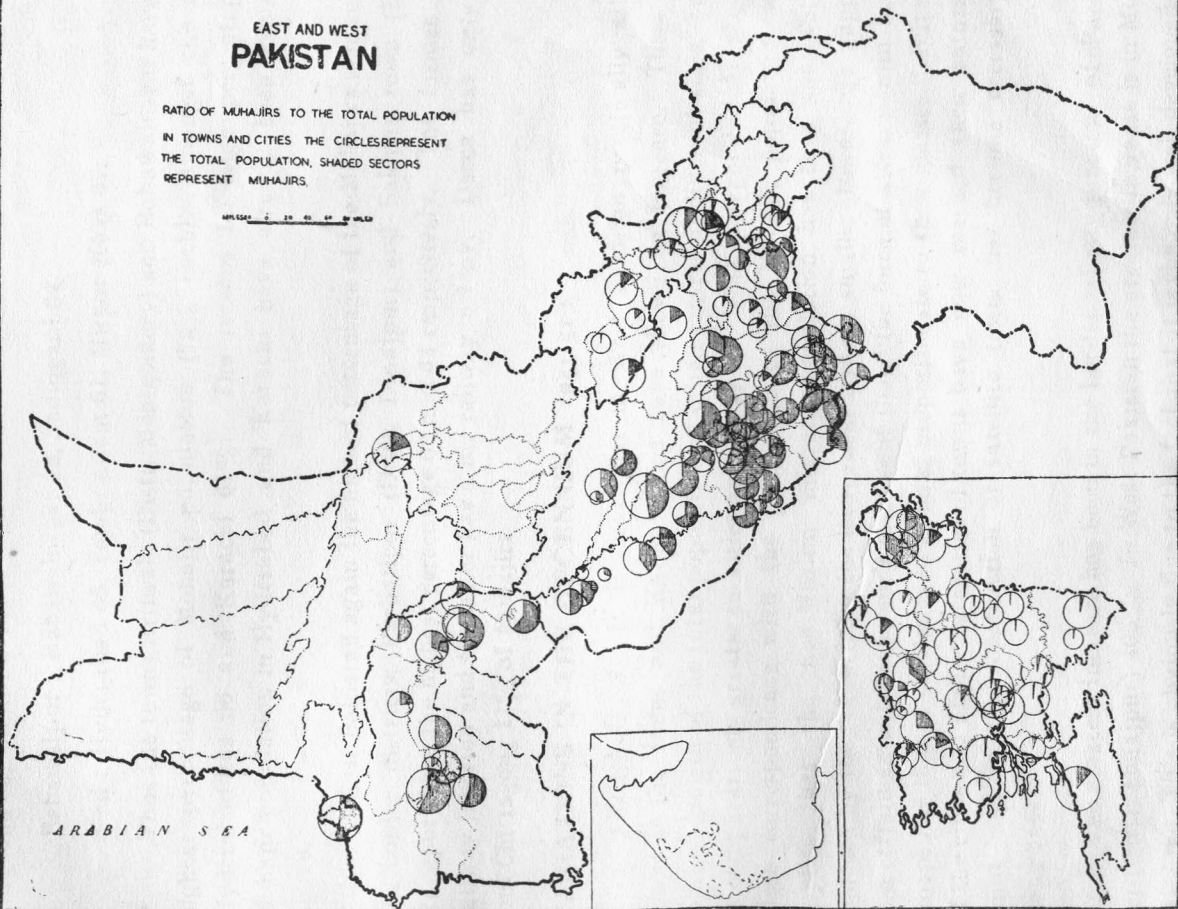
It is interesting to note that in the cantonments of Risalpur, Nowshera and Cherat the percentage of Mohajir population rises to 14.4, 24.2 and 26.6 respectively, the chief attraction to these towns appears to be the protection provided by the army.

It will be seen that the Mohajirs constitute a great percentage of the urban population in the Federal capital of Karachi, Punjab and Sind. They have not only replaced the non-Muslim minority which formed a good proportion of the urban population but have also settled in still greater numbers. These areas were nearest to the migrants from India and Hindus had left large urban property. It is estimated that of the total number of refugees that have entered W. Pakistan 30% represent the urban class.

EAST AND WEST PAKISTAN

RATIO OF MUHAJIRS TO THE TOTAL POPULATION
IN TOWNS AND CITIES THE CIRCLES REPRESENT
THE TOTAL POPULATION, SHADED SECTORS
REPRESENT MUHAJIRS.

MILES 0 20 40 60 80



The towns and cities, the Mohajir population of which is more than 60% are given below.

Punjab : Nankana 69, Lyallpur 68, Jhang 62, Chak Jhumra 62, Jaranwala 69, Sammundry 71, Toba Tek Singh 66, Gojra 65, Montgomery 62, Chichawatni 66, Okara 68, Arifwala 72, Khanewal 64, Tulamba 62, Mailsi town 68, Kot Addu 62, Sargodha 69, Mianwali 71.

Bahawalpur : Bahawalnagar 72, Sadiqganj 64.

Sind : Hyderabad 66, Tando Adam 61, Mirpur Khas 67.

Thus the towns Arifwala (Distt. Montgomery) and Bahawalnagar have the highest percentage of Mohajir population (72% each). Amongst the cities Hyderabad has 66 and Karachi 61%. The reasons for high percentage of Mohajir population in Hyderabad and Karachi have already been explained above.

In East Pakistan again the highest percentage of the Mohajirs is found in the border districts, Parbatipur (Distt. Dinajpur) and Saidpur town (Distt. Rangpur) have the highest percentage 62 and 63 respectively. The former is a railway junction and the latter has a big railway colony. Dacca has only 2% and Chittagong 11% of Mohajirs.

VARIATIONS IN THE DECENNIUM 1941-51 :

INCREASES. It is clear that in West Pakistan practically all the towns in the Indus and Kabul basins have shown an increase. There is a marked growth of the total population of urban centres of different sizes, but it is comparatively greater in cities and towns of higher categories. It shows a close correspondence with the percentage of the Mohajir population which implies that the non-Muslim migrant population has been substantially replaced by the inflow from the local rural area or smaller towns. It supports to a certain extent Levassur's statement that "the force of attraction in human groups like that of matter is in general proportionate to their masses." But most of the cities and higher categories of towns have now reached their saturation point and so the construction of satellite towns has become necessary in many cases.

The greatest increase has been in the border railway junction of Parbatipur (Distt. Dinajpur) 405%. In West Pakistan the greatest increase is in Murree 291.7 p.c. This is obviously due to the fact that it is the only well developed hill station now left with Pakistan. Other noteworthy increases in West Pakistan are Lyallpur 154.2%, Campbellpur Cantt. 120.4% Bahawalpur 115.3% Mitha

Tiwana 89.2%, Okara 81.8% Sujaabad 78%, Hafizabad 76.5% Jhelum 71% Chakjhumra 70%, Ahmadpur (N.W.F.P.) 67.2% Lahore has increased by only 26.5% while Karachi has increased by 176.4%.

In East Pakistan, excluding Parbatipur, the greatest increase is in the Saidpur (Distt. Rangpur) and Chittagong 219%, Dacca 29.5% Narayanganj 29.4%. Here also a good number of locals have migrated into these towns and cities for the opportunities they have offered. The increase has been limited practically to a few towns lying in the border districts.

DECREASE : In West Pakistan all the smaller towns in N.W.F.P. and Baluchistan show a decrease. It implies that non-Muslims who have migrated from these towns have been fully replaced by the local or mohajir population. Similarly in East Pakistan most of the towns of various categories in central and eastern districts (excluding Dacca, Bakerganj and Sylhet), show a decrease. It means that either a larger number of non-Muslims have migrated from this area than the Mohajirs who have come there or that the figures in 1941 census were considerably inflated.

VARIATIONS IN THE DECEMNUM 1941-42 :

It is clear that in West Pakistan practically all the towns in the India and Kabul areas show an increase. There is a marked growth of the total population of urban centers of different sizes, but it is comparatively greater in cities and towns of higher categories. It shows a close correspondence with the percentage of the Mohajir population which implies that the non-Muslim migrant population has been substantially replaced by the inflow from the local rural area or smaller towns. It supports to a certain extent Jevassour's statement that "the force of attraction in human groups like that of matter is in general proportionate to their masses". But most of the cities and higher categories of towns have now reached their saturation point and as the construction of satellite towns has become necessary in many cases.

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A GEOGRAPHER'S APPROACH TOWARDS THE PROBLEM OF NATIONAL LANGUAGE OF PAKISTAN

BY

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Of the immense and varied cultural heritages of humanity, language occupies the most prominent position. From the earliest stages of evolution man has been so endowed, so circumstanced, and such is his history that the gift of speech and a well ordered language, through myriads of trials of adaptation became the characteristic property of every group of human beings. Of all aspects of culture, language was the first to receive a highly developed form and became the most perfect and paramount means of expression, communication and hence the vehicle of thought among every known people. It was through language that the torch of civilisation was handed over from generation to generation and its essential perfection is still the pre-requisite to the development of culture as a whole.

Important though language is, statesmen in dealing with great masses of population so far have often ignored the unconscious influence of language on the course of world history and the growth of human civilisation. It is only in comparatively modern times that certain governments have pursued definite linguistic policies—often with unhappy results—and since the great European War, language is regarded as a more important factor in the self-determination of states than it was ever before. But even now, statesmen while formulating their linguistic policies, often forget that all human behaviors are predicated upon geography. Scholars have been too prone to divide knowledge into water-tight compartments and separate essentially related phenomena. Thus, frequently have language been divorced or considered apart from environment. This is most unfortunate, for the geographical environment

is the laboratory in which the reflexes, the impulses and the emotional tendencies of human beings are formed side by side with modifications in the larynx and tongue which fix some of the crucial concepts and values by associating them with definite sounds. So language is a function of geographic environment and like all other expressions of life, cannot be fully understood outside that context.

Inseparably linked as language is with its backgrounds, it reflects, as do few other arts, the life and thought of a race, a place or an age. A careful examination of the relationship between any language and its environment, geographic or human will bear out the truth of this statement. Therefore, before pursuing any fanatic linguistic policy for a nation or appraising any style or period of a language, we must understand not only the history, the genius, and the social and religious customs of its speakers but also the physiographic, climatic and economic conditions of the land of its inception.

Within this context if we study the languages of our own country we find that in few countries, so wide a diversity of linguistic expression is encountered as in Pakistan. The reasons of this diversity are very simple and can be readily discovered.

Our nation is a far-flung sisterhood of two regions with varying climates, topographies, natural resources, ethnic relationship and above all they are separated by a distance of one thousand miles at the least stretch.

West Pakistan is an arid plain bounded on its north and west by lofty mountain walls, intervened by thrilling, legendary passes of Khyber, Bolan and Tochi which often from the dawn of civilisation, formed the gateway and opened the plain to settlement by the innumerable human hordes from west and central Asia, like Scythians, Caucasians and Aryans. Whereas, East Pakistan rather north-eastern India with its moist green plains and here and there interrupted by grassy hills, formed the nucleus of fusion of the races of mongoloid origin with the local Dravidians.

From the time when the forefathers of Darius, Taimurlane and Genghis Khan, seeking fertile lands for exploitation and settlement came marauding to the north-western parts of India; a vigorous racial admixture of Scythians Seljuks, Sasanids, Tartars and Moghuls continued in West Pakistan and the process though slackened in the recent past is still continuing; whereas during all these times though a few adventurous raiders, swept down along the Ganges valley, none of them settled in climatically different Bengal and hence it remained aloof from the turmoil and whirlpool of innumerable human races.

And, thus our two regions have emerged as two distinct ethnographic units, West Pakistan being Scytho-Mediterranean and East Pakistan Mongolo-Dravidian.

As we have followed the course of our history and skipped over the geographic pattern of our country, we can see that it breaks into two distinct natural and ethnic regions and in each of them a distinctive native consciousness has been shaped and conditioned by influences of physical environment, of climatic differences and of common traditions, interests and aspirations. The spirit of these two regions, the folk-lore, the native speech, and the ways of thinking about things built up through generations, have given each region a unique character. In other words, two different cultures sprang up in these two regions. But the resulting pattern of culture in West Pakistan is still in a transitional stage as the process racial admixture continued here, right up to the recent past, while East Pakistan enjoying a longer historical calm has gradually attained a definite homogenous culture.

And as language is one of the chief elements of culture, it could not escape diversity. The power of environment together with the ethnic differences moulded the speech differently in each region. The language in each of them had subject matter, local customs, speech and points of view and employed a variety of technique, grown out of the folk and local modes of expression with their dissimilar rythms, imagery and symbolism.

And so we find that 45 million people in East Pakistan speak Bengali, a standardised, sanskrit-influenced mongolo-dravidic language which is totally different from Arabic-Persian infused, mixed, Dardic-cum-Aryan languages of Panjabi, Lahnda, Pushto, Sindhi, Balochi etc. spoken in various parts of West Pakistan, all of which are more or less akin to each other and their differences are merely gradations in dialectic changes. In between these principal languages of West Pakistan there are innumerable dialects like Bahawalpuri, Multani, Jangli, Jatki, Potwari, Ghebi, Hindki, Pattoki etc. All these languages are at a varying degree at transitional stages of development and most of them do not possess any comprehensive literature. In West Pakistan as the process of racial admixture and adaptation is still continuing, the stability of the linguistic and the racial boundaries have not yet been established, overlapping and rapid basic linguistic changes being common feature. Each area however small presents a picture of diverse linguistic expression. In fact, West Pakistan, right upto the recent past formed a great melting pot of different linguistic elements, churned by the forces of territorial compactness and interdependency, but have still not been crystallised into any definite linguistic crystal which is

bound to form. The partition of India followed by the scattered influx of Urdu-speaking refugees have given another churning to this process of crystallisation.

The central Asian invaders when settled in these parts and ruling India from Delhi, had to adapt their languages in a changed environment, and though the result of adaptation was different in different parts, for administrative purposes, they had to absorb more native words in their language. And out of this, a standard Urdu language gradually emerged. This language was held in high esteem by the people of the western region as through this language they ruled India. It became the language of the intelligentsia throughout the region and the modern trend is also to popularise this language and to express feelings and aspirations through this common multi-monarchy-enriched Urdu language, as it bears for them the reminiscences, and contains the rare recollections of that blissful period when their forefathers were holding the rein of state in their own hands. It may be mentioned here that the provincial governments in West Pakistan, long before partition, adopted Urdu as their own language and made it the court language and the medium of instruction in schools. And this, I think, readily explains the psychology of favourable reaction of West Pakistan towards Urdu as the only national language of Pakistan. During the Moghul and Pathan, the so-called muslim period of Indian history, the dynamicity of Bengali language followed a different, more mass-rooted path in its natural region of birth; and Urdu could not find a ready access to the social life of Bengal and remained and still remains an illusion to the fanatic Bengali muslim mullah who can not separate Indo-central Asian originated Urdu language from a theoretical, non-existent, Islamic language. And this clears the psychology behind the average Bengali speaker's so-called prejudiced attitude towards Urdu as only national language of Pakistan, and mullah's initial support to it. It should be mentioned here that despite the vigorous attempts by the muslim nawabs to introduce Persian and Urdu in Bengal, they were unsuccessful and the vestiges of their trial still remains in the form of a jumbled Urdu in a few elsewhere originated, recently settled nawab families. But that is not real Bengal. True picture of Bengal can be provided only by the masses, inseparably connected with their environment.

Now as we have studied the difference of culture and language in the two wings of Pakistan and the geographical forces behind it, we can say that any artificial attempt to make these heterogenous units uniform will tell upon the vitality of the nation as a whole. But the mottow of a single national language has been infused in us, crept in as something indispensable and became an aesthetic credo with us, by examples of innumerable mono-linguistic nations

and the environment-divorced linguistic philosophy. But before acting by inertia and blind imitation let us judge the applicability of a single language in our country and foresee our future in it.

If, according to the common view, either Urdu or Bengali is made the only national language, both the wings, because of their differential geography, history and ethnography cannot accept any one of these languages. Urdu in Bengal will be followed by natural antagonism and Bengali will meet the same opposition in West Pakistan. Again, if by extensive propaganda, the natural sentiment of the people is suppressed of any region, cultural darkness will soon overcast the intellectual horizon of that region. Because, it will be something which is against what is inherent in them. It should also be known that a language cannot be planted among a people, unless it is preceded by a migratory intermixture. In our case, that is not possible. Again, hypothetically speaking, even if we accept one national language and try to develop natural tongue side by side, soon the centre of attraction will shift from mother tongue to national language as from the economic and social point of view that will earn a better job and position; and also out of a vague nationalistic sentiment both the regions will fall a prey to imitation of the, elsewhere originated linguistic style, symbolism and imagery in which unless the population itself is transplanted, cannot attain a high standard. In this way, uniformity in language will let loose a tussle between natural tongue and artificially created national language and hence there will be an unnecessary wastage of national energy.

This is not a hypothetical occurrence which may occur at some future date. The world has witnessed such wastages of national energy many a times in different countries. Before the Napoleonic era, Brittany in France had a Celtic language, different from French. But with the rise of Napoleon, and his vigorous drive for French cultural unity, French became the national language. Though Celtic was not banned in Brittany, people slowly began to imitate French style and slowly the originality or the creative power of France's one of the culturally advanced provinces was totally lost. And today we find Brittany dull, indolent and playing an insignificant role in the national cultural activity. By this not only Brittany lost its creative power, French nation as a whole lost some of her potential cultural resources. This has been understood of late and personalities like Clemenceau, Poincare, and August Comte, vigorously prevented this uniformity in language. French people now lament the disappearance of picturesque folk-idioms, songs, dances and other provincial peculiarities which aimed to reawaken the slumbering spiritual and cultural life of the various provinces and movements started to liberate the souls of

the provinces from their departmental prisons. The Alsatian Autonomist movement based on strong local feeling, is directed chiefly against the rigorous manners in which the French language has been introduced in the school and for official usage. Examples can be multiplied from other countries. Catalan in Spain once boasted a highly developed contemporary European language. But in the rush for Spanish unity, Spanish was made the national language and the whole region became the cultural suburb of Madrid. But in the early thirties, vigorous movement started in Catalan in the name of Prat-Catalinism to arrest its conversion into a cultural desert, and all connection with Spain was severed and Catalan was declared national language there. More or less the same thing happened to Welsh in England and Provençal in Italy. The time from which English became the national language, the originality of the region started dwindling; and today in greater English culture we do not find any significant contribution from Wales.

However, all these do not mean that language has no unifying force. In fact it works like cement in a slightly varying continuous region. As West Pakistan forms a distinct continuous natural unit and as Urdu is the patriotism inspiring language of its intelligentia, born and brought up at the hands of their forefathers and as Urdu will be the inevitable gradual outcome of the intermixed linguistic jargon, enhanced by the scattered influx of Urdu-speaking refugees, it can work miracle in creating an united regional consciousness and deep-rooted patriotism. But it will prove suicidal if two heterogenous, fur-flung regions like East Bengal and West Pakistan are brought under same language without being preceded by vigorous racial admixture. Even racial admixture and common language does not necessarily bring about national unity between differing natural regions. Americas, Australia, New Zealand and other colonies inspite of having a common language and racial tie with their mother countries, seceded from them.

Is it then unity is not possible in our country? It is possible; but let us first understand what is unity. By unity we do not mean wiping out of all dietic, dressic, and linguistic differences but to live peacefully and harmoniously without encroaching upon other's domain or right. Unity is not an aesthetic credo, not an affectation or not the end in itself, but the condition of realisation of some common objective. If we have a common objective before us, if we want betterment of human race, if we want equal opportunity and status for all and above all if we want a classless society and eternal continuation of humanity, we can aim at these ideals through our respective languages. If we can create in man this outlook, unity will come near and nearer, not to speak of our two regions only but between all peace loving countries of the world.

But the quickest way to arouse that spirit in man is by modern liberal education through mother tongue. Again the age of unsuccessful utopian unity through a chosen few like monarchs, dictators, leaders or representatives have passed into oblivion. The twentieth century is an age of mass awakening and consciousness—the ideals, policies, international relations today must have a wider mass-basis, which can only be maintained by bringing the mass language in the fore-front. Moreover unity between countries depends upon economic aspects. If two widely varying regions or countries join hands to tap and develop the potential resources and help cure the social maladies of the countries on a co-operative basis, a lasting type of friendship grows between them, whatever differences there may be. British Commonwealth of Nations, the East European Congress and the International Comintern are astounding examples. So, it means, that unity can be maintained despite our cultural differences. Of course that unity will be a bit loose but to what utility is that unity which is strong and rigid but cannot enliven the dormant faculties of the nations constituent members or help peaceful co-operative cultural mingling? Actually what we need is some kind of unity in diversity. We need maintaining our age-old diversity in languages so that a more representative Pakistani culture may grow up.

So, in view of the fact that if one language is given priority over another, one gains at the expense of the other unleashing forces of hatred, and of the fact that unity can be established not by compressional forces from outside but by attractive forces from within—not legislation or propaganda but by spontaneous uniting tendency, we must instead of making one language superior or giving priority, establish both Urdu and Bengali on the basis of equality, side by side with the re-organisation of the economic, political and cultural structure of our society on revolutionary lines. Then and only then we shall be confronted not with two languages, one of which is suffering defeat while other emerges victorious, but by languages out of which as a result of lengthy economic, political and cultural cooperation of the regions, there will emerge the most enriched national language which will be neither Urdu nor Bengali; but a new language which will have absorbed the best elements of both the languages. In this way in the international field also humanity will not be confronted with a language growing at the expense of others but by hundreds of national languages out of which as a result of long economic political and cultural cooperation of nations, there will emerge first the most enriched single regional languages, then the regional languages will merge into a common international language which of course will be neither English, French, Russian,

Arabic, Latin, Urdu nor Bengali but a new language which will have absorbed the best elements of the national and regional languages.

But how can two languages be given equal status and used for official purposes in a single political unit? Now once equality is accepted of the two languages, side by side with making our regional relations more flexible, official works may be performed simultaneously in both the national languages either with the help of interpreters or by making both the languages compulsory in both the wings. Of course it will create a bit difficulty. But before we decide finally we have two alternatives before us to accept.

✓(1) Either, to bear the slight interpreting difficulty or the difficulty in learning an additional language.

✓(2) Or to sustain a loss of cultural vitality in certain parts of Pakistan. Definitely the nation will bear the first minor difficulty. That is not an impossibility or a new policy. Switzerland has three national languages and official works are done in all the three. Soviet Russia has more than twenty national languages and no single language is considered national. Now, our educationist should decide whether to make both the languages compulsory in both the wings or make interpreting arrangement. But maintain we must both the languages.

So, in view of the above mentioned truths, if we adopt both Bengali and Urdu as national languages of Pakistan, it will provide us with a true Pakistani picture and will help us to develop a truly nationalistic culture; for it is only through discovering, developing and using the resources of each separate regions or community that anything approaching universality is likely to be achieved. So, with the expectation of a country

“Where order in variety we see

And where though all things differ, all agree.”

(Pope.)

I conclude.

AFFORESTATION IN THE THAL

BY

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Struggle between man and nature is not a recent issue but it dates back to the time, the evolution of this rational animal was completed and from then onwards the whole human history is the story of this fight, a long episode of his miseries and insignificance, but this poor creature with the advent of the current century is coming out of this chronic suffering and is giving the impressions of overcoming the nature. The reclamation of the Thal is the story of such a gigantic human attainment, and the flourishing immature promising trees over a vast desert of evershifting sand dunes and dust-storms, hitherto waterless and lifeless where not a blade of grass had ever grown for centuries together, is a testimony to this manual victory over the most callous forces of nature.

Thal occupies the area between 30° 30' and 32° N and 70° 30' and 72° E in the Sind Sagar Doab of the Punjab. It stretches from the foot hills of the Salt Range in the north to the apex of the Doab in the south for about 175 miles. It includes the cis-Indus territory of Mianwali district, western part of the Khushab Tahsil of Shahpur district and the northern portion of Muzaffargarh district; being bounded on the west by the high banks of the river Indus and on the east by that of the Jhelum. Average width is 50 miles while at places it exceeds 60 miles. It has an area of about 5 million acres.

The legened about the formation of the Thal that the Indus had been flowing through the middle of this area down through the ages and had been shifting its channel towards the west and constantly depositing the sand, which later on was raised into heaps by the wind that we now see, is in agreement with the opinion held by the Director of the Geological Survey who writes, 'There is no doubt that thick deposits of alluvium, consisting of sand clays and loams which covers the Punjab to the south and south-east of the Salt Range, have been deposited by the Indus and the Jhelum rivers and their tributaries

during sub-recent times and that during this period these rivers have changed their courses considerably and have so deposited these alluvial beds over wide areas.

“The superficial sand dunes in the Thal area are due to the deposition of the fine sandy material by winds which blew from the coastal and desert region of Sind and Rajputana to the south and south-east.”

Whatever the little changes in the boundaries of the Thal, took place, it is beyond questions that this tract has been a waste land for a very long time. In the month of June the temperature fluctuates between 110° and 120°F while sometimes it rises even above this, and in winter it reaches the freezing point. Range of Temperature is therefore very high. Rainfall is 13 inches in the north and 8 inches in the south, this decrease from north to south is perhaps due to the Salt Range in the north. Sand storms are frequent and very severe, their velocity at times rises 70 miles per hour while the normal is about 60 miles an hour.

Three different and distinct types of soils demarcated in the recent survey of the area are :—

(1) a narrow belt of hard clay lying along the base of the Salt Range from one river to the other, contains 43% clay, about 54% silt and only 3% of fine and coarse sand. Healthier response from the soil and easier drainage here have resulted in the concentration of the most of the afforestation operations in this area and some of the biggest, finest and most promising national parks are to be located here.

(2) a long narrow strip running along the full length of the river Indus and making the western boundary of the Thal contains 15% clay 21% silt and 61% fine sand and 3% coarse sand. The western portion of this elongated belt is marked by the parallel lines of sand dunes along the left bank of the river Indus. It is absolutely devoid of vegetation except a few stunted bushes here and there and perhaps it will remain so in the coming few centuries because the high level and the broken topography is a great impediment in the way of drainage. Rest of the portion of this type is successfully being drained and is growing bumper crops and flourishing trees. It is on its credit that the afforestation was first started in this area near Bhakkar.

(3) The whole of the remaining area comes under this type. It is sandy having 55% or more of coarse sand, 22% of fine sand and 26% or less of silt and clay. The soils of the entire area are lacking in vegetative contents and nitrogen; but some patches here and there are quite fertile which are being

reclaimed by the Tube Well Scheme of the Thal Development Authority because canal water can not reach there due to again of its high level and some other difficulties.

Thal is a tract of low rainfall, of sandy soil and precarious and scattered pasturages, the true characteristics of a real desert, hitherto barren and life-less and devoid not only of the species of fauna but almost of flora.

This vast sea of sand, with sand waves running from north-west to south east is dotted with patches of hard soil which support trees like Ber, while the whole surface is covered with stunted bushes. This general sandy undulating landscape is broken at places by the long stretches of perfectly level ground which are locally named as Pattis, which can row excellent crops and good varieties of trees if water is made available there. One such belt occurs west of Nurpur and extends without break as far as the Muzaffargarh district. Its width ranges from $1\frac{1}{2}$ miles to 2 miles. Here the best villages are located and throughout the Thal it is in this Patti that masonry wells are to be met with.

The vegetation of the Thal consists almost entirely of low brush-wood and grasses. The trees are very few and can be counted on fingers and are to be found, with few exceptions, only around the villages. Ber is the only tree which grows in such a region of extreme climate, though now with the coming of canal water Shisham has become most predominant. Among the bushes which are found here and there, the most common are the Phog (callingonampolyimides), the Lana (*Carozylum-foetidum*), the Bui (*paundria-pilosa*) on which camel browses the Madder (*Colatropics-gigantea*) and the Harmal (*Peganum-husmela*) which no one will touch. In good rainy years when the other climatic conditions, too, are favourable, the yield of grass is considerable, but even then it can not compete with other areas in the Punjab due to its rugged and hilly nature. Similarly it can not feed as many cattle as the other areas in the Punjab do. Of the innumerable varieties of grass which are grown here, the most paying are the Khabal, the Dhaman and Chhimber.

This is all the traditional Thal had at the time of the partition. Very few crops could be grown and they too were mostly dependent upon the rain which is very uncertain. Nomadism, therefore, remained the main occupation of the Thal throughout the past ages. In years of deficient rainfall people used to sell their oxen, cattle ornaments and could be seen in far off districts like Lahore, Shekhupura, Lyallpur, Montgomery, begging for a single loaf. Again due to the migration of a large number of population from India, the pressure on the land was increased and it had to be parcelled out in small and uneconomic units. In the Lyallpur district the normal population was increased by 32%

and in Montgomery district by 20%. It thus became essential to remove this pressure and the only way out was to develop new areas and to remove the agricultural population to such areas and settle them there on permanent basis. Refugee problem was further accentuated due to the untimely rain which resulted in the migration of the Thal population to other districts. The Panjab Government, therefore, decided to take up the suspended work of extending the irrigation over the Thal area which could only be justified on the basis of increased productivity and increased return by way of revenue and water rate. By 1949 out of the channels which had been constructed with a capacity to irrigate $\frac{1}{2}$ a million acres of land, only channels with a capacity to irrigate 3 lakh acres were functioning; the others were choked up. What still worst was that only 88 thousand acres were actually being irrigated. This brought an enormous loss of productive capacity and of potential wealth. The project could become remunerative only if more areas to which irrigational facilities were extended, were developed. Therefore, besides the irrigation project the Panjab government formulated a road building project for the Thal area. This project envisaged the construction of 666 miles of new roads at a cost of Rs. 30 million.

Now at this stage it was realised that the aridity and the moving sand will not allow the contemplated development. Newly constructed roads and irrigation channels were choked up with sand. A gale of wind was enough to bury the young crops or blew away the sand exposing the tiny roots to dry in the sun. Thus, a scheme of regional afforestation was visualised for the first time in the history of this sub-continent for this area. It has been proposed to grow trees over 1.5 lakh of acres which is about 10% of the total area being developed under the Thal canal project and about 3% of the total area of the Thal. This area is about 12.5% of the forested area in the Punjab and (2.4)% of the total area under forest in the whole of Pakistan including East Bengal. A scheme of afforestation has already been approved by the Thal development Authority costing 4 crores of rupees. This scheme provides for the following :

(1) Shelter belts of about 275 feet wide along the main roads and canals over an area of about 5,000 acres. Their main purpose is to check the soil movement. Shelter belts have been found the cheapest and most effective protection for the roads and canals in the Thal. Also these shelter belts will produce timber and fire-wood and will add to the forest resources of the country.

(2) Compact blocks to be known as "National Parks." Areas ranging from 1,000 to 22,000 acres have been reserved at different places for these

compact blocks in the Thal. An area having 2500 or more of acres under forest are called National Parks while the areas having less than this are named differently such as Rakhs. They will be worked on 20 years rotation. Each National Park is divided into 20 parts and each part is afforested very year while the rest of the area remains under temporary cultivation so that the utilisation of the area can be made to its fullest extent. Ordinarily 720 trees are grown in one acre. When they will reach the age of 6 years their number will be reduced to give more space to the bigger and valuable trees to flourish more. In the 12th year if again they would be found congested some will again be cut down to provide still more space to the bigger trees keeping always in view that no big gap is left there, that is they are equi-spaced. Theoretically it may be so, but practically it seems impossible to attain this perfection because very seldom we see an area having a uniform vegetative contents. After 20 years the part forested in the first year will be cut down to supply timber and other valuable wood. The total expenditure on one acre in the first year of its plantation is Rs. 60 only, while in the remaining 19 years it is 15 rupees annually. The total comes to about 350 rupees in 20 years of its growth, while after it is cut down it will bring 700 rupees. It is apart from the income gainted from the selling of grass, crops and wood in these 20 years. If that is included the income rises very high. This is clear from the following tables of income and expenditure of Kundian National Park in the year 1952-53 and 1953-54.

Year Income Expenditure

1952-53	Grass etc. Rs. 658/8/- Temporary cultivation Rs. 29338/4/-	Plantation work Rs. 48402/9/- Establishment Rs. 7130/-/-
Total	Rs. 29996/12/-	Rs. 55532/9/-
1953-54	Grass etc. Rs. 813/6/- Temporary cultivation Rs. 47800/-/- Sale of stumps Rs. 3892/6/-	Plantation work Rs. 44500/-/- Establishment Rs. 19599/-/-
Total	Rs. 52505/12/-	Rs. 64099/-/-

Now from the above table two things are clear.

(1) that the income from this national park has been doubled from 1952-53 to 1953-54. In 1952-53 it was Rs. 29000/- while in 1953-54 it rose to about Rs. 53000/- and

(2) that the total expenditure remained almost the same. In 1952-53 it was Rs. 55000/- and in 1953-54 it was about Rs. 64000/-, this difference of about Rs. 9000/- between the last two years was due to the abnormally irregular rough hard topography on which they had to spend a lot to get it levelled. In 1952-53 the expenditure after deducting the income from it, was about Rs. 26000/- which is just the normal, while in 1953-54 it was reduced by 35% and the expenditure on one acre fell to about Rs. 10/- instead of Rs. 15/- for the previous and Rs. 60/- for the newly planted acres.

(3) Village forests. It has been proposed to grow 50 acres of forest for each village over the total area of about 45000 acres. Our farmers have always the temptation to burn the cattle dung and other farm refuse for which they have to pay nothing. The value of this manure for increasing the yield of their crops is not fully appreciated by them. Perhaps it is even a better economic proposition to pay for higher cost of imported fire-wood, rather than to burn this valuable manure. But all efforts to convince them in this respect during the past half a century have failed. The yield of our crops is, therefore, low, and progressive deterioration is still taking place. The best way to check this menace was sought when it was decided to grow forests near each new village to supply the villagers with fire-wood just as their doors at very cheaper rates from these village forests. It has been, therefore, decided to complete village forests in only 8 years.

Apart from this it has been made compulsory for every farmer to grow at least 4 trees in one acre. Forest Department gives free advice in this connection. They have already started a campaign to convince the public that for the prosperity and stability of the agricultural economy, forests are the most effective measure and like the other solid substances of the earth's crust, such as salt, building stones and metals, we depend chiefly upon forests. We eat them in myriad ways, cloth ourselves with their fibers, cut them into pieces, shape them into tools to build our houses, extract their juices and dig their roots for drugs and medicines, we burn them for fuel, shape them into articles of luxury and above all they increase the productive capacity of the soil by increasing vegetative content through the rotting and mixing of their fallen leaves in it, and thus supply some of the basic wants of the nation.

To facilitate the afforestation operations the whole Thal has been divided into four divisions namely Jauharabad, Bhakkar, Leih East and Leih West which are under a separate circle to be known as Thal Circle. The foremost difficulty which had to be faced was the non-availability of the skilled personnel. All the workers taken from the Panjab Forest Department who had no experience of carrying out the afforestation in such a region of extremely arid climate. However, the Conservator of Forests, Multan Circle (Panjab, the author of the Twenty Years Afforestation Scheme himself consented to carry on the work over the Thal area and took over the charge of the newly built Bhakkar Division in October 1951. The standard technique of establishing the irrigated plantation had failed, the division therefore, had to create a batch of workers, train them into a totally different way and give them necessary instructions to find a living place in such a desert.

With the approach of the planting season in February 1952 a young officer was sent to carry on the afforestation with head quarters at Bhakkar. They lived in a traditional Kacha house measuring 10' x 12' feet and few feet above the ground which served as their office, sleeping room, kitchen, godown and drawing room to receive the visitors if any. After a week or so the office had been opened, a sweeping sand storm ascended from the horizon and overlapped the whole Thal; a gush of storm entered the room from the hole through the door and blew away the records of this office through the opposite window to some unknown places. The rest of the evening was spent by the Head Clerk, Accountant, Record Keeper, Typist and Despatcher searching for their individual papers in the vicinity. The records of this division are still lying incomplete because the papers lost in that dust storm were never traced.

There was, however, work to be done in the field apart from repenting over this loss. According to one commitment by the Forest Sections, they had to stock 1300 acres by the end of the year 1952. They made their own channels at suitable places from the main canals and started the work in three national parks and seven village forests in the Bhakkar Division.

Nurseries were sown and the planting stock was imported from the established forests of provincial divisions to stock the new areas. Again with the approach of the hot season, the intense heat and the sand storms became the feature, and though at this time the building for residence and the office at Head Quarters had been completed at Bhakkar and the office staff was fairly protected, the conditions outside jeopardised the whole set up; the young nurseries were buried under a thick mantle of sand, some were uprooted, the few which survived were in a very precarious condition. The roads, the paths,

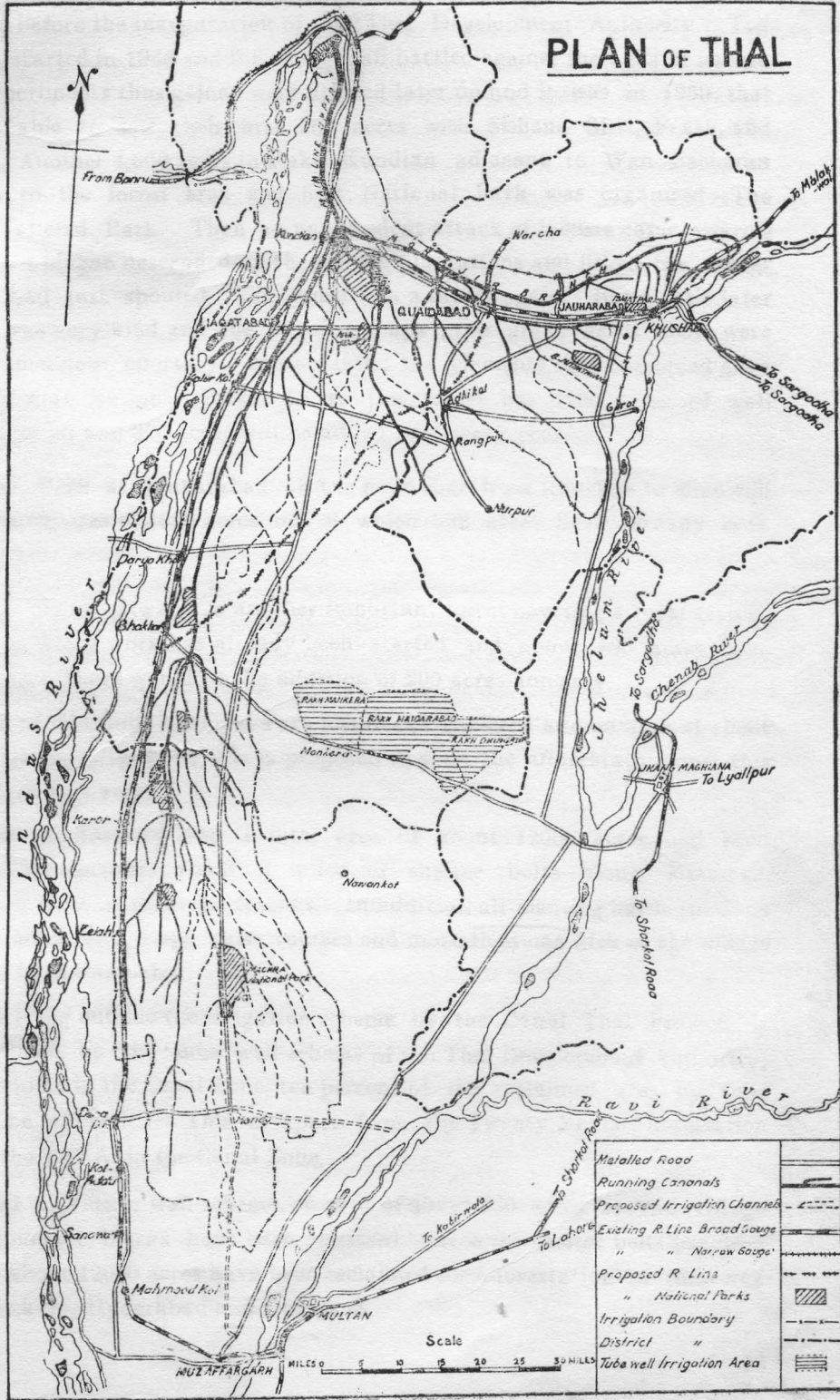
the trenches were fully choked up and the whole irrigation system was completely paralysed. Things have taken a negative turn but man's diligent and discriminating spirit and above all his intellect came in the way and saved the whole scheme from failure. Scientific approach was sought and it was decided that even if the 80% of the nurseries are uprooted and dried up, there should be restocking again and again to save the remaining 20% which are very precious.

Another point of supreme importance which had been ignored so far, was taken into consideration. It was realised that there should be something which should come out quickly and prove as a wall against the soil drift. After deep researches and great experiments a plant known as Jantar was found which grows in a few days. It may be called the turning point in the history of afforestation. Jantar was grown all round the young nurseries and it saved them not only from the wind and hence from moving sand, but also from the continuous drought though slightly by preserving some moisture in the fields. In this way, therefore, they were able to grow 1300 acres by November 1952.

During the course of time the evolution of the new technique of afforestation specially suited to the unstable—soil and the hot and the arid climate of the Thal, had been completed. Age old method of afforestation by digging trenches have already failed in the Thal, so the new method of planting the trees was applied which proved very successful and gave the higher percentage of growth. This Plot Method with flood irrigation has been found the standard method of plantation in a typical area like the Thal and has been named "Basharat Square" method after the forester who developed this technique. Trees are grown in plots and open irrigation is provided. Shisham stumps are planted over these plots, and the seed is sown over the bunds where they get seepage water as is the case when they are sown over the bunds of the trenches. These plots can be given repeated shallow irrigation which is so necessary in the hot climate.

The resultant beautiful growth of the trees and the nurseries was convincing. The forest Deptt. had established itself on sound footing in the Thal. The staff trained in Bhakkar division was distributed and work was started in Jauharabad, Leih East and Leih West Divisions by the end of the year 1952. Here too the work was initiated with the same spirit and untiring zeal. During 1953, 1840 acres were stocked to which 2010 acres more were added by the Spring of 1954. Jauharabad Forest Division has taken a lead in raising the nurseries and it has supplied millions of tree stumps. It is perhaps due to the comparatively better soil and easy drainage, a feature of this division.

PLAN OF THAL



Metalled Road	
Running Canals	
Proposed Irrigation Channels	
Existing R. Line Broad Gauge	
" " Narrow Gauge	
Proposed R. Line	
" National Parks	
Irrigation Boundary	
District	
Tube well Irrigation Area	

Scale



Another area of 14,000 acres in Wah Bacharan was the only forest which was started before the inauguration of the Thal Development Authority. The work was started in 1948 and the whole staff battled against the odds of nature and the experiments thus gained were utilised later on and it was in 1950 that they were able to sow their first 360 acres with Sisham, Siris, Frash, and Mulberry. Another 4,000 acres in Rakh Kundian adjacent to Wan Bacharan were added to the forest area and first National Park was organised—The Kundian National Park. Then an unprecedented attack of locusts came, swarms of this winged-plague descended on these fresh plantations and licked the tender wigs that had just spouted. The forest was a desert again. But a little later the season was very kind and the naked stumps grew green as if they were making tremendous efforts to compensate; the elements thus combined gave the Thal its first National Park. Today this forest has 1200 acres of well established forest and 300 acres will be added to it every year.

Ismat Park at Jauharabad on the main road from Khushab to Mianwali extends over an area of 1000 acres, out of which 992 acres have already been forested.

Rakh Mitha Tiwana is another important forest covering a total area of 3500 acres on which work has already been started and about 400 acres have been forested. There would be the addition of 200 acres annually.

Plan of Harnoli National Park has been completed and an area of about 4800 acres has been reserved. It is proposed to start the afforestation over this National Park this year.

Uptill the January 1955 a total area of about 12000 acres had been forested. This includes about 8 miles of shelter belts along Mianwali, Muzaffargarh Road at different reaches. In addition all planting has been done along 100 miles of village water courses and more than one fifth of the village forest, have been completed.

Area lying outside the irrigation scheme by the Canal Thal Project, is being reclaimed by the tube well scheme of the Thal Development Authority, and similar to as in the Canal Zone, ten percent of the reclaimed area by tube wells will be afforested. This is apart from the Twenty Years Afforestation Scheme of the T.D.A. in the Canal Zone.

Under this tube well scheme, an area of about 450 acres around village sites for compact blocks have been proposed. Area for shelter belts has been reserved. About 12000 acres have been reclaimed for afforestation in this way in Rakh Mankara, Hyderabad and Dhingana.

Due to the rough topography of the Thal; the expenditure on levelling the ground by heavy earth moving machines was found great, about 50 Rupees an acre. To reduce the expenditure it was decided in 1953 to grow crops over the flat plots along with the planting of trees. It was not an easy task. The odds of nature were still there and the forests staff had no such experience before. It was also not known to them that which crops would flourish better and give the sufficient returns. Many agricultural crops were tried; but it was found that the fertility of the newly broken soil could not support well every crop. Bajra failed badly, wheat did little better and gram was satisfactory only in sandy areas. In the Spring of 1954 sugar cane was tried. There were difficulties in getting the seed because it had to be imported from outside. Fifteen acres of cane crop planted along with trees is doing well and bears a bright promise that this valuable crop will yield net returns of rupees 200 to rupees 300 per acre and if this all comes out well, a method of afforestation almost free of cost would be found.

Of the many species grown over the Thal, Ber, Frash, Siris, Mulberry, Kikir and Jand are very successful. They are grown in mixture with Shisham which is the most prominent covering the maximum area. Simil is another specie which provides very good match sticks and has an excellent market outside. No big industries are being started as yet because the forest products have ready markets in the adjacent areas. Means of transportation are also being developed to have an easy access.

An area of about 300 acres near Kaloor kot has been reserved for Mulberry trees. The plantation work has already been started under the supervision of Mr. Gill the Agricultural Officer T.D.A. The trees are coming out well but no one is certain that they would bear fruit; because the climatic conditions are very uncertain. A training school has been started in the Bhagal National Park of the Leih West Forest Division. The National Park is being developed as a research centre of land utilization and afforestation studies for aridzones. Forest guards are trained in this school. A method has already been found for stocking the uncommanded areas with the useful Ber plant by lift irrigation at economical rates as a result of 1953-54 experiments in the Bhagal National Park.

When the afforestation scheme is fully materialized, there would be found about twelve national parks. about forty Rakhs, hundreds of miles of shelter belts and nine hundred village forests,—all these combined will bring prosperity to this area. They will give fertility and stability to the Thal Soil. They will save the people and the crops by the scorching heat of the sun by reducing the temperature and providing them with shade which they never had for the

last few centuries. When these forests would be fully grown up and developed they are estimated to yield about seventy five lakh cubic feet stocked wood per annum. This is considered enough to meet the requirements of the new settlements in the Thal. In addition to this there would be a continuous supply of thin wood from thinning fellings which will be available for supply to the surrounding areas of the forests.

The national parks will provide work for an average of ten thousand labourers daily. It would be possible to maintain 20000 cattle with the grass produced in these forests. Their economy can be judged by comparison. Take the 10000 acres Changa Manga plantation of the Punjab Forest Department. It is feeding the well established sports Industry of Sialkot and many other wood working centres in Lahore, in addition to small scale industries within the forest like basket making, silk rearing and extraction of honey. The National Parks in the Thal have a potential value which is ten times greater than the above mentioned plantation with all its productive capacities.

In spite of having such a potential value, it should be remembered that these 1.5 lakhs is not so big an increase in the forest resources of our country. It has been found by various calculations that for the stability of the agricultural economy, 25% of the area should be under forests. As compared to this our country has a very low percentage. The following tables will bring forth the contrast in forest resources between our country and some European centuries.

Province	Forested area	% to total area
Sind	1161 sq. miles	2.3%
Punjab	1872 sq. miles	3.2%
N.W.F.P.	592 sq. miles	4.0%
Baluchistan	1805 sq. miles	3.2%
East Bengal	4447 sq. miles	9.7%
Total	9877 sq. miles	4.4%

Country	% of forested to total area	Country	% of forested to total area
Austria	33	Italy	20
Belgium	18	Norway	31
Czechoslovakia	34	Poland	23
Finland	74	European Russia	44
France	19	Sweden	55
Great Britain	6	Switzerland	23
German Reich	19		

Now it is clear from the above table that Pakistan's percentage of forested to total area *i.e.*, 4.4%, as compared to the European countries is very low. Now these forests in the Thal will increase the percentage of the area under forests to the total area in the Punjab only from 3.2% to 3.6% and of Pakistan from 4.4% to 4.5%, (4.5) *i.e.*, the increase will be only .4% in the case of Punjab and .1% in the case of Pakistan as a whole. This conclusion is very depressing because it shows that our country is extremely under forested and we are required still to grow forests over an area of about 35 million acres to get that 25%. This is an estimate of the work still to be done, however, the reclamation of the Thal and the dynamic spirit by which the afforestation work was started and the speed by which the afforestation operations are being carried on, show the realisation both of the Government and the public of the forest's role in the agricultural economy, and let us hope that in other areas, being reclaimed by the new projects in Pakistan, the forests will be given their due share and in this way will increase the forests wealth of the nation as a whole catering for the whole requirements of it.

TOBACCO IN CHACH

BY

A. H. RATHOR, SARGODHA

East of Attock, a modest settlement on the bank of the Indus where Grand Trunk Road crosses the river, extends a strip of low-plain country bounded, north and south, by the river and the road respectively, rising gradually to the eastern heights of moderate elevation. These stretch along much of the boundary between the districts of Hazara and Attock, the plain under reference being a portion of the latter.

This lowland patch of limited dimensions has assumed more importance than its size would warrant. North to south it is hardly 8 miles with its eastern and western limits not more than 22 miles apart ; yet it is steadily outweighing other parts (tehsils) in its contribution to the economy of the district.

Locally the plain is known as Chach, a modification of the word 'cheech'* meaning a lake. In fact the local usage of the word is of wider import. It signifies a level gently sloping plain between the river and the foot-hills. In this sense Chach covers much that is excluded from the present survey. The surface formations and the nature of the soil suggest the probability that the area was once a part of the much wider bed of the river. Sedimentation detached it from the main course giving shape to a shallow lake and the subsequent indrought of water into the river exposed the bed. A fertile stretch thus emerged amid rough barren surroundings.

To an observer travelling west of Hasan Abdal, a fertile and fascinating spot, the entire country appears to bear a bleak and monotonous aspect ; broken irregular surface dotted with clayed mounds and sandy ridges in between which trench-like depressions carry dry courses of seasonal streams ; here and there some plants stand in the wind-swept farms ; but as he approaches Chach on the right bleak gives place to green ; vegetation appears and also cultivated fields.

*The root of this word is in obscurity ; some take it as of Greek or Hindi origin.

It may well be characterised as an oasis where agriculture is the mainstay : but one cannot fail to observe difference between the type of cultivation and the range of crops associated with Chach and the type typical of other parts of the Punjab. Cultivation though much influenced is not conditioned as much by climate as by soil and water. Climatically Chach lies in the sub-humid, sub-montane north but does not escape some of the influences of semi-arid sub-montane north-west upon which it borders. Mean temperature ranging from above 65 F as maximum to round about 36F as minimum and precipitation hardly exceeding 20", severity becomes a conspicuous feature. Spells of hot weather in summer and cold in winter are not infrequent. It is generally free from Frost. Winter is the season of longer duration and maximum precipitation, rainfall generally coming in storms. But even the moderate rainfall suffers high variability resulting often in crop failures. Moderateness and uncertainty of rainfall, coupled with lack of perennial streams are reflected in the distribution of cultivated land which chiefly depends on the fertility of soil and availability of water. Climate, therefore, has made agriculture in Chach an enterprise of a complex character. To rest content with food-grains and a couple of items more is to remain on the verge of economic insolvency. Farmer must get as much in variety from the soil as the conditions in different parts of the year permit.

As to the formation of soil, climate and geology appear to have closely collaborated. Mixture of sand and clay is wide-spread. Although both derive from the parent rock much of sand element has been deposited here by stormy winds from the highlands of the Frontier Province.

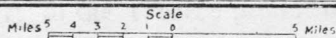
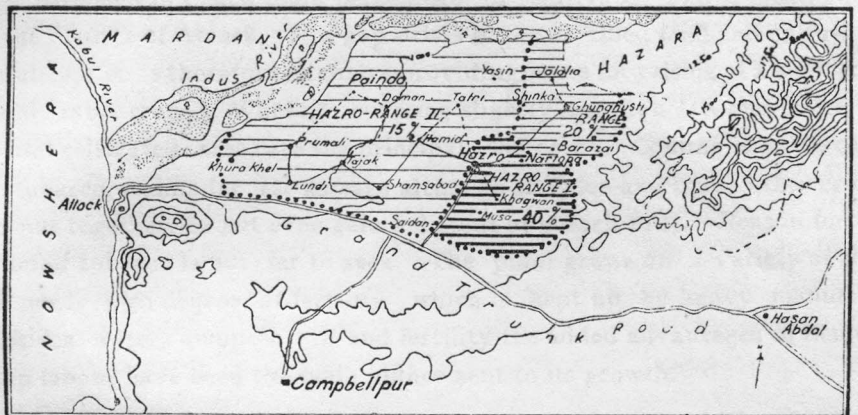
Water, more than soil, is the important factor and is obtained mostly from wells† so numerous in the area. Some seasonal canals too exist. Chach is rich in the reserves of sub-surface water the cause of which appears to be the existence of a sub-surface layer of hard rock upon which seepage from the river and percolation of much of rain water result in enormous accumulations. Water-table has come up to an easily accessible depth making sinking of wells in the soft surface-layers quite convenient. In some parts water is just near the surface.

But well-irrigation naturally sets a limit to the agricultural operations. It is not practicable to irrigate vast estates or farms of large size so numerous in districts served with canals like Lyallpur, Montgomery etc. This

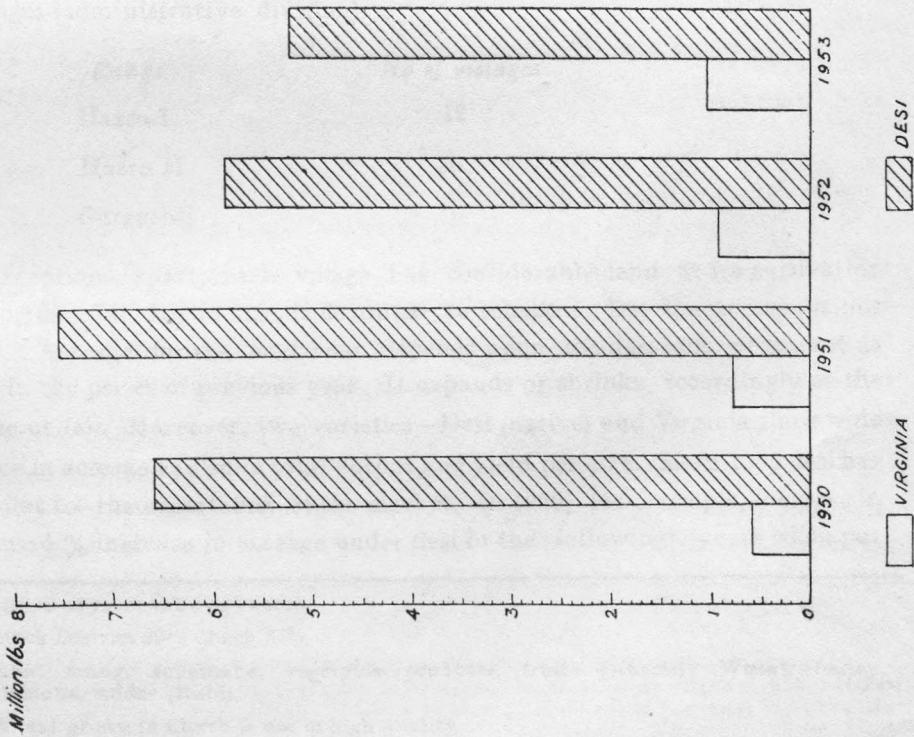
*Climatic Regions of West Pakistan. By K. S. Ahmed (Pakistan Geographical Review 1951).

†Importance of wells may be judged from the fact that if a certain waste area is ploughed watered and brought to a state of production, reference to it is made not in terms of the 'utilization of land' but of the 'development of well, !

TRI-RANGE TOBACCO PRODUCING AREA OF CHACH
 PERCENTAGE OF CULTIVATED LAND UNDER TOBACCO



PRODUCTION



in combination with the disproportion between population and the extent of land under cultivation is the basic cause of small holdings, usually of 7 to 8 acres, and the major reason for people's concentration on crops that bring fat returns. Although in Chach plain percentage* of cultivated land is much above that of the district of Attock, yet a gap exists between tilled land and culturable waste. Cultivation is therefore intensive providing scope for raising of a number of kharif and rabi crops. † Wheat, ‡ covering slightly less than 1/2, and maize 1/6 of the total cultivated area, are the principal food crops. Coming next, in comparison, tobacco, claims far less acreage although in value and trade other crops, singly or put together, do not even gain a distant approach to it. Reason for the cultivation of tobacco is not far to seek. The plant grows on a variety of soils but still needs high degree of fertility which is kept up by heavy manuring. Here, besides water, temperature and fertility the added advantages of manure and cheap labour have been the main inducement to its growth.

At present a large part of the tobacco producing area of West Pakistan lies on both sides of the Indus north of the G. T. Road. In it Chach plain, comprised of 84 villages in not less than 72 of which tobacco is cultivated, is most prominent in that it is the single instance of a unit-area where this non-food crop dominates the agricultural pattern. The villages have been grouped into three ranges (administrative division).

<i>Range</i>	<i>No of villages</i>
Hazro I	12
Hazro II	50
Gurgushti	10

Exceptions apart, each village has considerable land fit for cultivation and a portion of it, fair in size, is devoted to tobacco. But the acreage is not constant. Acreage for the next year depends upon the demands of market as reflected in the prices of previous year. It expands or shrinks accordingly as the prices rise or fall. Moreover, two varieties—Desi (native) and Virginia show wide divergence in acreage as also in total output and yield per acre. Since 1950 desi has been subject to the uncertainty of the market. In 1950, for example, increase in prices caused % increase in acreage under desi in the following* years when put

*Addition of more than 600 acres,

**Attock District 39% Chach 65%.

**Maize, mung, sugarcane, vegetable products, fruits (Kharif); Wheat, barley, vegetable, melons, fodder (Rabi).

***Wheat grown in Chach is not of high quality.

in, 1951 prices remained the same, next year that a reduction of % in acreage*. Further cut the fall in prices 1952 acreage for 1953 to half of 1951 and less than that of 1952.

Virginia, however, has gained in popularity and coverage of tilled land. From a meagre area of 252 acres in 1950 it was estimated to cover more than 900 acres in 1953.

As with acreage, so it is with production. In the table are shown figures of production and of acreage for four years preceding 1954. Virginia shows a steady upward trend, yield rising from slightly above half a million to more than 1½ million lbs. It is of interest that the rate of rise in production is in keeping with the increase in acreage. Decrease in the production of desi has not been proportionate to reduction in average per acre as yield in most cases has gone up due to improvement and care. Of the three ranges, Hazro I, by virtue of early settlement and start, more fertile soils and facility of water and transport, has the leading position in acreage as well as in production followed by Hazro II and Gurgushti. In Hazro I tobacco claims more than 40% of cultivated land; in Gurgushti percentage falls to 20 and in Hazro II to 15.

PROCESS.

As regards process of cultivation, tobacco bears close resemblance to paddy in so far as transplantation and labour are essential for both. Virginia as well as Desi entail careful hand-work and close watch from the moment seed is thrown in the soil to the cutting of last plant. A little disparity occurs in the periods of sowing. Desi seed is sown in late October to mid-November; Virginia by the middle to the third week of October. Seed-beds are first laid. One tea-spoonful of virginia seed for an acre is sown broadcast in 1/20 kanal bed; in case of desi 1 to 2 ozs in 1/10 kanal bed suffice for an acre. The plot or nursery, normally 4 to 6 feet broad, is frequently irrigated after sowing which partially accounts for completion of germination within a period not exceeding 3 weeks. Upon it a fence of sarkanda plants, lying east-west invariably on the north, is so bent as not to hinder sunshine but secure germination and protect budding plants from frost. Such measures are necessary after November or earlier if cold waves reduce temperature before time.

*Price per maund.

	Rs.
1950	Rs. 20 to 48
1951	52
1952	38

∪ Addition of more than 600 acres.

* By more than 900 acres.

In case growth is unsteady rotten manure is applied. After germination weeding must be done frequently till the plant has attained enough height to be ready for transference to another farm. Best time for transplantation is when the plant is between 6" & 9" high and bears 5 to 7 leaves. Hoeing is done frequently and not too deep for fear of injury caused to the rootlets. Desi seedlings are transplanted in well ploughed, highly manured and irrigated farms at the end of January and the process lasts till the end of March. Irrigation usually done with intervals of 7 to 10 days needs a bit care. Each row is submerged in water but, unlike a paddy field, water should percolate in the soil to make it soft and moist and not stand in the farm. Such measures are necessary for the development of leaf, its size and thickness; for the thicker the leaf the more bitter it gets and therein lies its value. Spreaded plants give more yield of leaves than the stalks. The plant when 2½ to 3 feet high should be topped before the first blossoms open; but the favourite practice is to pick off and discard 3 to 4 bottom leaves and top the plant leaving about 8 leaves on each. The aim is that each plant may bear only such number of leaves as it may bring to the fullest development and to ensure that, as far as possible, plants will mature at about the same time. Suckers developing on axils are removed as often as they appear.

Harvesting time beginning at the close of May, when crop is mature, extends into the first half of June. Ripening is indicated by a change in leaf colour from dark green to a lighter, reddish shade, thick leaves taking on a mottled appearance and giving a soft leathery feeling, snapping when creased.

After harvest crop is heaped up in the field in stack as exposure to sun is necessary for fermentation to take place in the moist plants. A couple of days after stacks are dismantled and then restacked. Repetition of this process 2 or 3 times leads to perfect fermentation and the crop is ready for being taken to the cultivator's premises and thence to mandi for disposal to the purchaser.

As to virginia, process is much the same. Seedlings are transplanted in well ploughed, intrinsically rich soil away from the village dwellings to avoid application of 'night soil'. Plants are 2½ to 3 feet apart, each farm thus carrying a limited number. In case soil is not very fertile or has suffered exhaustion, rotten manure is generally applied; aluminium sulphate too may do well at a later stage if the growth is steady.

Crop when mature has, plants about 3 yards high, bearing thin, soft, yellowish leaves. Picking of leaves starts in mid-May and is completed in most of the fields by the end of August. Leaves are then cured in barns.

* More than 900 acres.

Virginia is immune from the depreddating substance that collects at the root of the desi plant when water is scarce and soil dries up and from which a shoot—Khum—rises to sap the energy of the plant turning it yellow. Watering the field is only a partial remedy but in such a circumstance harvesting the crop is the safest course.

Desi tobacco, also called balakhi, is the typical variety of Chach. It grades from fine into inferior stuff, difference depending upon the nature of soil, quantity as also quality of manure applied, intensity of irrigation and post-cultivation operations. Sandy loams or light sandy soils, because of low soluble mineral matter, tend to produce leaves of large size light colour and weak aroma. Heavy soils containing more silt and clay produce dark heavy leaves of small size and strong aroma. In the range of grades white leaf is a finer stuff. The crop in this case is cultivated in not-heavily manured canal-irrigated farms where seasonal canals exist, and is left in the open, after harvest, for about a fortnight resulting in the change of dark leaf colour to light whitish shade.

As the plant is strong and makes heavy demands of food on soil, manure is essential. Farm yard manure and sheep-folding are mostly in use. The area round about Chach is not of much value for agriculture. Whatever vegetation, grass or bush is available, it sustains sheep, cattle and camels, a natural condition which should, of necessity, make large supplies of manure easily obtainable at low rates. Normally 20 tons of farm yard manure is applied to an acre.

Weaker soils may need more. Sheep-folding and camel dung have the advantage of imparting fertility to the soil in a measure that one crop does not totally absorb it. Residual nourishing capacity of the soil is sufficient for the succeeding crop (in Chach generally maize). Sheep-folding being rich in the same kinds of nitrogenous and organic ingredients as tobacco is composed of, its importance is evident. Of late aluminium sulphate has been utilized with happy results.

LABOUR.

Labour, as has already been mentioned, is a great factor so far as the production of tobacco on commercial scale is concerned. Not only is hard and careful work by hand a necessary condition at every stage of cultivation, but in barns, in snuff works and in cigarette works cheap skilled labour is a great essential.

Desi tobacco has had to face fluctuations in point of acreage and production whereas virginia, since its introduction into Chach, has thrived amazingly. A maze of barns has thus cropped up throughout Chach for the drying up of

virginia leaves. The process involving careful hand work, more than 10,000 workers, including those working on farms, are employed seasonally (from May to September) in about 800 barns.

As regards consumption, tobacco, in this country, is used either in 'hooka', in cigarette or as snuff. Sunff though widely in use and from ancient times has had a stagnant market and the number of labourers, working on daily wages, mostly in Hazro and Gurgushti, has all through post-partition years remained in the neighbourhood of 600.

Cigarette works, situated outside Chach, consume more than 70% of Chach tobacco. Consequent on ever increasing demand at home, number of workers in cigarette factories has increased. Strength of labour in 1949 stood at a couple of hundred but in 1953 more than 6000 workers were estimated to be in the employment of cigarette works.

DISPOSAL.

Gadi tobacco (loose balakhi plants tied up in small packages) is either brought loose or in mat-covered bundles to the Licenso ware-houses having due approval of the Central Excise Department. Selling is conducted either by open auction or through stores as and when the purchaser comes up.

Having undergone curing process at barn, virginia leaves are graded up generally into 4 to 6 parts, tied up in bales and despatched to the company's premises. Here after ascertaining the correctness of grades the manager fixes the price per lb. of each grade. Prices usually range from Rs. 8 to Rs. 2 per lb. Grades may be more or less in number. It depends upon the physico-operational processes the crop undergoes. Quantity or the percentage content, in the cured leaves, of leaves of different grades also has a range, great or small.

	Price per lb			Percentage content in the cured leaf
	Rs.	a.	p.	
Grade 1	2	0	0	10%
Grade 2	1	8	9	10%
Grade 3	1	8	0	20%
Grade 4	0	10	0	40%
Grade 5	0	8	0	10%
Grade 6	0	6	0	10%

*In N.W.F.P. and N.W. Panjab 'hooka' the form of 'chilam a typical manifestation in everyday life. It is a common sight to find groups of people in the bazar, in hotels and on the roadside sitting round in a ring with 'chilam' in middle. A handful of leaves put in the chilam, half a dozen puffs reduce the leaves to ash; chilam then renewed.

*Leaves with high degree of bitterness are preferred in snuff. Lower grades are consumed in hooka. With the smokers of chilam white leaf is very popular for its 'taste and flavour'.

Even the portion, left in processing, does not go waste and may be sold at annas 4 per lb. Cost of production per lb is annas 13 and the average sale price annas 14 to Re. 1 per lb. Thus the barn holders, each usually owning more than one barn, stand much to gain as an average barn has the capacity to cure five thousand lbs bringing to the owner Rs. 300 to Rs. 1000 in one season.

The position in Post-partition period besides affecting the tobacco industry of Pakistan as a whole, has brought about tremendous change in the economic outlook in Chach. Viewed in the perspective of the sub-continent, Chach was just a patch before 1947. Southern India was its rival. Even the first few years of independence did not lend much hope or encouragement to the industry. Imports from Bharat counted for much. Ban on the imports from Pakistan resulted in the fall in demand as Chach had market mainly in the East Panjab and Utter Pardesh. Government's timely attention however secured the industry from collapse. Restrictions on the import of Indian tobacco, by raising protective duty on it by 50 per cent and reducing the same by equal percentage excise duty on the country tobacco gave a fillip to the industry opening out a future for it.

Refugee Bidi industrialists, who formerly imported bidi tobacco, bidi wrapper and bidi in large quantities, carried out successful experiments with the country tobacco for which demand for use in bidi has increased to more than three lakh maunds. In 1950 Pakistan tobacco Company was installed in Karachi. The Company made experiments with virginia seeds on different types of soils in the Attock district especially in Chach. Following the great success of these experiments, increasing attention on the cultivation of virginia is yielding happy result. Improvement in the situation may be judged from the fact that in 1953 country virginia met more than 40% demand of the Company in the manufacture of all brands. To give flavour to some blends white leaf is also used.

TABLE II.
Acreage and Production of Tobacco in 1953-54
(Pakistan)

	Year	Area (1000 Acres)	Yield (1000 lbs.)
TOBACCO	1953-54	193	201,988

All that has had immense impact upon the economy of minutely cultivated and multicropped Chach. In West Pakistan's 27% share in the total output of Pakistan Chach all figures for tobacco area and provision for W-Panjab E-Panjab and whole Pakistan claims not more than 3 to 5 per cent, which quantity [may look small against the background of the total production of the country, but it should mean a lot for the local conditions of a small area. Keeping in view water and many other factors, land available for cultivation is limited and does not permit of a sudden large-scale increase in tobacco area. Farmers, have to increase the tobacco acreage at the expense of other crops as they well know an acre under tobacco is a far greater gain than the same devoted to any other crop. Cash out-turns, in some cases, have increased five fold. For instance, produce worth Rs. 500 in 1950 from the same acre swelled to Rs. 3,000 in 1953. Thus a flow of coppers into their coffers has come to have transforming effect upon the texture of village society. Change though for the present restricted to a small number is beginning to be reflected in the condition of the populace as a whole. Farms have grown into villages, villages into small towns; market places are taking on modern colour with new-design buildings and electricity.

But however much disposed to expansion of acreage under tobacco, they cannot lose sight of the market demands and uncertainty of prices and have to give due consideration to vegetable products, garlies, fruits etc. in regard to which an unbalance in the market will not affect them adversely.

What is required is the increase in the production of tobacco without a disadvantage to other crops. The primary need, therefore, is the co-operation of the Government in devising a scheme for boring more wells. Considerable tracts of fertile land lie untouched for want of water. If this culturable waste is brought under plough, agriculture in Chach will have wider scope and economic out-look still wider horizon.

*East Bengal 70%; former administration units of West Pakistan—Panjab and N.W.F.P. 15% and 12% respectively (Economics of Pakistan By Dr. S. M. Akhtar).

TABLE I*
Acreage and Production in 1950-53.

Range	Acreage								Production (in lbs)							
	Desi				Virginia				Desi				Virginia			
	1950	1951	1952	1953	1950	1951	1952	1953	1950	1951	1952	1953	1950	1951	1952	1953
Hazro I	1150	1229	1136	...	164	220	319	...	35,48,552	37,41,858	34,80,392	...	3,34,364	4,54,342	5,95,955	...
Hazro II	634	959	556	...	48	209	224	...	16,00,773	18,62,823	11,45,207	...	1,69,687	1,51,515	1,64,988	...
Gurgushti	567	808	391	...	40	223	144	...	14,03,239	19,33,426	12,63,929	...	78,642	1,74,926	1,77,500	...
	2351	2996	2083	1550	252	652	687	908	66,42,564	75,38,107	58,89,528	52,32,082	5,82,675	7,80,785	9,20,443	15,64,322

*Courtesy Regional Excise Department, Government of Pakistan, Rawalpindi.

BOOK REVIEWS

AMERICAN GEOGRAPHY : Inventory and Prospect Symposium, Editors Preston E. James, Clarence F. Jones and John K. Wright, Syracuse University Press, Syracuse, 1954. 9x6 inches; XXVI and 590 pp. Maps, ills., bibliogr., indexes (Published for the Association of American Geographers).

Geography is as old a field of study as any and in days of unrecorded history it found its tap root in earliest poetry, folklore and travel tales. Veins of geography thread even the fabulous Odyssey of Homer. Indeed, spoken geography came much earlier than its written version. But in spite of long history and hoary traditions, in our own time, the recognition of its status as a philosophic and scientific field of study was somewhat tardy. Yet today geography has come of age, and it regarded as one of the systematic sciences in all modern and advanced countries. Still there is no dearth of educated laymen who pose questions such as what is geography? What do geographers do? What is the value of their work? This book essays to give some of the answers and demonstrates that geography is today one of the link roads winding through the vista of the ever expanding field of social and applied sciences.

The present work is a symposium sponsored by U.S. National Research Council through its Division of Geology and Geography and edited by three well known American Geographers. There are 26 chapters containing contributions by individual geographers on chosen topics projecting a particular field of geographic study. Before publication the contents were subjected to discussion in detail by the Committee on American Geography. The book contains 25 items of illustrations including diagrams, maps, graphs and sketches and there are 8 pages of selected air photographs. Profuse bibliographic references at the end of each chapter are a special feature of the book and self explanatory chapter outlines are provided in summary form at the beginning of each chapter.

Preston E. James introduced the subject matter by focusing attention on various aspects of modern geography. He emphasises the essential unity of the field of geography in spite of its recognised subdivisions and stresses the

special character of the geographic method and the evolution thereby of a specific discipline. Several chapters are devoted to familiar and well known branches of geography such as the regional concept, historical geography, political geography, military geography, economic geography, agricultural geography, climatology, geographic study of soils, geomorphology, plant and animal geography, cartography and geography of resources and transportation.

New and growingly fascinating fields of study form the subject matter of chapters on medical geography, physiological climatology, geography of population and settlements, field techniques and interpretation of air photographs etc.

But what stimulates thought is the probe into the evolution of the geographic concept itself. Modern geography began to take roots with the writings of Ritter, Ratzel, Vidal De La Blache, Davis, Von Richthofen, Mackinder and L. Febvre. Their heritage has received much embellishment from the scholarship of many second generation French, British and American geographers. Some of the significant geographic studies include such landmarks as Ritter's *Erdkunde* (1859), Ratzel's *Anthropogeographic* (1882), Raymond Beazley's *Down of Modern Geography* 1897, Semple's *Influences of Geographic Environment* (1911), Davis' *Essays* (1904), and Mackinder's *Democratic Ideals and Reality* (1919). Very recent attempts to give shape and concreteness to the geographic concepts are found in Horthshorn's *Nature and Purpose of Geography* (1939), G. Taylor's *Geography in 20th Century* (1951), G. East and Wooldridge's *Spirit and Purpose of Geography* (1951) and Wright's *Geography in the Making* (1952). This book marks the latest milestone in this survey.

Some geographers may find the subdivisions and classifications of geography rather over-simplified and terminology overstretched. One significant omission, however, appears to be a separate chapter on the history of geographical thought. Though this field of study seems to have been confused with certain aspects of historical geography. Another field failing to get specific recognition is the now well established investigation of geographic influences in land use practices. The case for social and human geography also goes by default.

Finally, the title 'American Geography' denotes somewhat limited horizons in attempting this excellent appraisal of the evolution and development of modern geographic philosophy and its scientific conception. Would it not have been better to eschew hemisphericism and present the work as 'Geography: Inventory and Prospect'? Yet all in all, it is a valuable contribution to geography and boon to its modern votaries wherever they may be. Indeed, it is an achievement of American scholarship.

NAFIS AHMAD

INDIA AND PAKISTAN: A general and Regional Geography by Prof. O.H.K. Spate. Mathuen, London, 1954: 827 pages with a half-tone frontispiece, two folding and 158 text maps and diagrams. Price 65 shilings.

Professor Spate's book meets a long felt demand for a detailed geographical study of the Indo-Pakistan sub-continent. It is obvious that he has taken great pains over this book. He has read very widely recent publications on geography and other allied subjects dealing with the two countries. The bibliographical note and the footnotes acknowledge the growing works of young geographers of the sub continent. He has not even missed some of the well known non-geographical books on the countries and for him, they form the 'Back-ground'.

The book is divided into four parts. Part I, The Land, deals with the physical back-ground-structure, relief, climate, vegetation and soils. The soil chapter is based on the system of the famous Russian scholar, Schokalsky. He could not have done better than to depend on Schokalsky, as the Russians have done marvellous work on soil. The soil map has been adopted after the map in the Great Soviet Atlas. It is really a useful chapter since this material is not easily available to any average student of the region.

Part II, The People, is an attempt to describe the social complexities of the sub-continent and deals with population and its problems, ethnic stocks, languages, religions etc. It shows how much of Malthusian, the author is. A typical Western attitude to the Eastern problem: De Castre's conclusions in "the Geography of Hunger", (which has a not unreasonable optimistic study of the population problem in the East) might have been utilised by the author with benefit.....benefit, if not for him, for the readers, at least! He discusses, at length, the 'Net Reproductive Rate' but does not say a word what it actually means and how this rate is determined.

There is also a brief account of the history of the sub-continent from early times to the emergence of the states. The part ends with an interesting and enjoyable chapter on villages and towns. There is detailed study of some towns.

Part III, the Economy, deals with agriculture, industries power and mineral resources, transport and trade, with statistical tables at the end. This part is the least instructive. The treatment of some topics taking the

sub-continent as a whole diminishes the value of the book. Pakistan has not been given adequate attention. Some of the essential points have not been brought out. Some of the maps require correction and more precised location of details. A large part of the statistics is of little practical value. Some portion became out of date before the book was put in the market. This was inevitable because of the fact changing economy and the long time that the book took in print.

Part IV, The Face of the Land, which comprises more than half the book, is a detailed study of the regional geography of the two countries. The field of study is very vast indeed and the author himself states in the preface 'the book is to a large degree no more than a reconnaissance.' This however is an understatement as far as Part IV, is concerned. In his studies of the various regions of the sub-continent Prof. Spate has presented an intimate description of each region. He has dealt with the physical aspects in a very scientific manner. He has wisely avoided the usual method of discussing separately the geography of the different provinces (or states) of the two countries. But his regional study is based on empirical regional scheme which he arrives at after a discussion (quite a sermon on Indo-Pakistan geography) on the 'Basis' Says he, 'our study is far too rich, varied and subtle to be tied down easily by rule and line. 'The Pithawala—Kazi S. Ahmad controversially over the Peninsular littorals and natural divisions has been commented upon. Personal comments should better have been avoided.

Excepting Part IV, the book on the whole is rather sketchy. This perhaps is due to the fact that Prof. Spate has attempted to cover too vast a field and a limited space. A great deal that is vital has been inadequately treated. The chapters dealing with climate, population, agriculture, industries and transport needed treatment in greater detail. There are several portions of the book which could have been omitted without in any way affecting the usefulness of the work to make room for a more detailed study of these topics. The chapter on historical outlines of India and Pakistan is not strictly speaking relevant, but if the author think that it is necessary for a proper appreciation of the problem of these two countries a summary could have been included in an appendix form. The inclusion of a chapter on Ceylon in a geographical study of India and Pakistan is rather difficult to understand. Mr. Farmer's well written account of the geography of Ceylon should have been omitted.

Finally the book which, as the title suggests, is a regional and general geography, includes some un-geographical subjects. The author defends himself. Says he, "I am a man and think nothing human indifferent to me." So far so good. But, then, he goes on to give us his own personal views and hasty conclusions. He does not end there..... he suggests his own Spatian solutions of the problems. The Bazar English is a wasting asset and is an insult to Shakespear's tongue! Urdu is very similar to Hindi!! The Muslim culture is shot through the strands of 'Indianism'!!! (Mr. Spate has very carefully avoided the word "Hinduism"). Partition seems the only way out, in the Kashmir dispute! The weakness, fiscal and military of Pakistan, compelled the evacuation of the military stations in the frontier Agencies!! The Frontier problem is pregnant with difficulty and danger!!! The future of Pakistan depends on a solution of this!!! So on and so forth.

But such comments regarding the arrangement of the book, or inadequate treatment or irrelevancy of certain topics do not in any way take away the value of Prof. Spate's book. The author's treatment of his subject, his lucid style of writing and many useful maps and diagrams make the book indispensable for all advanced students of geography. It is bound to rouse great interest in the geography of this important part of the world and it certainly opens vast field for further work.

A. M. P. & F. R. K.

GEOGRAPHICAL NEWS

" The Eighteenth International Geographical Congress has been tentatively scheduled for August 9—18, 1956. So that the Preliminary Circular may reach the greatest possible number of geographers, the Organization Committee requests that all geographers not included in the World Directory of Geographers published in 1952 by the International Geographical Union please remit their names and addresses to

Prof. Hilgard O'Reilly Sternberg

Secretario Ejecutivo

XVIII Congresso International de Geografia

Av. Presidente Antonio Carlos 40, 9º andar.

Rio de Janeiro, Brasil.

Professor Sternberg should also be notified of any changes of address as set down in the Directory. "