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EFFICIENCY OF AGRICULTURE IN WEST PAKISTAN[1]

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I have selected the subject "Efficiency of Agriculture in West Pakistan" for this address, because, though first priority is given to the development of agriculture in all the progressive plans of West Pakistan, adequate research work has been wanting in this field.

Though the cultivated area in West Pakistan has increased by ten per cent between 1953-54 and 1962-63 it has failed to keep pace with the food requirement of our fast growing population.[2] The declining land-man ratio[3] with almost no improvement in the yield of many crops, has drawn the attention of the authorities toward improving the general conditions of agriculture in the country. *Report of the Pakistan Sugar Commission* 1959, *Land Reforms* 1959, *Report of the Food and Agriculture Commission* 1960, and *Census of Agriculture* 1960 are a few preliminary steps in this direction.

In order to plan for the future and discover the best uses of land for stable and optimum returns it is necessary that the efficiency of agricultural land my be measured and studied under the present set of physical and economic conditions and partiuclar national needs.

The Method

Efficiency of agriculture reflects the influence of varied physical, economic, social and historical factors. Many methodological approaches based on different single or multiple quantitative and qualitative criteria for measuring the efficiency of agriculture are possible. Productive equivalence in terms of possible normal yields of staple crops has

[1]Presidential Address given at the Geology, Geography and Anthropology Section of the Seventeenth Annual All Pakistan Science Conference, Karachi, Febraury 15, 1965.

[2]2.16 per cent per annum compound rate of increse.

[3]M. K. Elahi, "Agricultural Land Use in West Pakistan", *Pakistan Geographical Review*, Vol. 18, No. 2 (1963) p. 61.

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been used as basis of land classification in Germany.[4] This system did not take into account the human and economic factors that can change the basic quality of land.

M. G. Kendall of the London School of Economics and Political Science devised a highly mathematical method based on per acre yield of crops. A much more practical and simplified version of this method of 'Ranking Coefficient' of per acre yield was later introduced by him. It was adopted and exemplified by L.D. Stamp, in his book *Land for Tomorrow*'.[5]

No doubt that yield per acre is one of the best criteria for such a study but intensity of cropping[6] also is a fairly good index to the efficiency of agriculture. Kendall's method of ranking coefficient has, therefore, been used in a modified form. To get a composite production index double criteria of yield per acre and intensity of cropping have been used.

Ten years' average acre-yields of nine widely grown crops of West Pakistan have been taken on district basis (Table 1). Ranks according to the yield and intensity of

TABLE 1—YIELD IN MAUNDS/ACRE—WEST PAKISTAN (AVERAGE 1953-54—1962-63)

Serial No.	District	Wheat	Grams	Barley	Rice (cleaned)	Maize	Jowar	Bajra	Cotton (Lint)	Sugar-cane (Gur)
1		2	3	4	5	6	7	8	9	10
1	Peshawar ..	8.5	3.6	8.3	8.0	16.5	9.4	3.8	1.4	32.9
2	Hazara	6.1	4.5	6.2	6.6	8.4	5.6	4.6	1.3	25.8
3	Mardan	8.2	3.9	9.6	10.3	14.7	7.0	..	1.5	34.1
4	Campbelpur ..	5.5	4.5	5.9	..	16.2	3.5	3.6	1.4	23.7
5	Kohat	5.4	3.2	5.4	7.7	9.8	3.9	5.6	..	23.7
6	Bannu	5.6	3.9	4.7	10.0	9.5	4.1	4.4	1.7	26.9
7	D. I. Khan ..	5.2	4.1	4.1	8.0	7.9	2.9	3.1	.9	25.0
8	Mianwali ..	5.4	3.6	5.0	8.8	7.0	3.1	3.6	1.5	26.5
9	Rawalpindi ..	6.5	5.3	5.8	8.5	9.1	3.7	3.9	..	27.2
10	Jhelum	6.7	5.5	5.4	5.1	9.2	3.8	4.1	1.2	19.5
11	Sargodha ..	10.0	4.9	7.5	8.6	9.3	4.1	5.7	2.5	38.3
12	Gujrat	8.3	5.5	7.1	10.2	10.6	4.9	5.2	2.2	28.9
13	Sialkot	7.4	5.3	6.6	9.6	7.5	4.7	4.6	1.3	24.9
14	Gujranwala ..	9.2	6.5	7.0	10.7	10.3	5.1	5.3	2.0	28.7
15	Sheikhupura ..	9.1	6.4	7.0	10.2	9.5	4.9	5.7	2.0	26.9

[4]C. O. Sauer, "Problems of Land Classification", *Annals*, Association of American Geographers, Vol. 11 (1922) p. 4.

[5]L. D. Stamp, *Land For Tomorrow* (Bloomington : Indiana University Press, 1940) p. 99.

[6]Represents the ratio of total cropped to net sown area.

TABLE I—*Continued*

Serial No.	District	Wheat	Gram	Barley	Rice (cleaned)	Maize	Bajra	Jowar	Cotton (Lint)	Sugar cane (Gur)
1	2	3	4	5	6	7	8	9	10	11
16	Lahore	9.4	6.8	7.5	8.2	8.8	6.0	5.7	2.2	26.4
17	Montgomery ..	11.7	6.8	8.0	8.4	11.0	6.7	8.0	2.6	34.1
18	Lyallpur	13.1	8.9	9.6	9.5	13.8	3.9	6.8	2.8	34.9
19	Jhang	9.0	7.0	7.7	8.6	10.5	4.1	6.3	2.3	29.2
20	Multan	12.0	7.4	9.2	6.7	9.9	5.7	5.6	2.6	35.2
21	Muzaffargarh ..	8.2	5.4	6.5	6.9	8.3	5.4	5.3	1.6	26.4
22	D. G. Khan ..	7.2	4.1	6.0	4.6	10.9	4.5	3.9	1.5	24.9
23	Bahawalpur ..	8.9	7.0	7.1	8.1	8.1	5.8	5.8	2.1	33.0
24	Bahawalnagar ..	8.8	6.7	5.3	7.3	6.8	6.2	5.6	2.0	33.2
25	Rahimyar Khan ..	9.2	6.4	7.3	8.1	6.9	5.7	5.8	2.5	29.5
26	Khairpur ..	7.8	6.5	7.3	10.3	4.4	6.6	5.7	2.0	40.3
27	Jacobabad ..	6.4	6.1	6.0	11.8	5.2	5.2	5.0	1.7	28.7
28	Sukkur	7.6	7.1	8.3	10.9	4.9	5.5	5.8	1.8	26.4
29	Nawabshah ..	7.7	3.4	4.9	8.8	6.3	7.6	7.9	2.2	42.9
30	Larkana	6.8	4.9	10.0	10.5	5.0	5.6	..	1.9	33.5
31	Sanghar ..	8.5	5.9	..	7.1	6.2	5.2	5.1	2.6	41.6
32	Tharparkar ..	8.0	7.3	4.6	6.7	4.9	4.6	2.8	2.6	53.6
33	Dadu	6.7	4.5	6.4	11.1	4.2	6.6	4.5	1.5	37.5
34	Hyderabad ..	8.6	5.2	5.6	7.5	5.1	3.1	6.1	2.6	48.3
35	Thatta	4.7	4.8	4.6	5.2	4.5	4.4	5.1	..	33.9
36	Quetta	5.3	..	7.0	..	6.6	..	..	..	..
37	Zhob	3.2	..	7.2	..	6.8	..	..	..	..
38	Loralia	6.3	..	4.5	..	6.4	3.1	3.0	..	..
39	Sibi	6.1	6.2	5.6	8.7	8.4	5.6	3.3	..	..
40	Chagai	3.2	..	..	..	..	1.4	..	..	..
41	Kalat	6.7	..	6.7	6.2	..	..	..	..	..
42	Kharan	5.2	..	..	..	..	..	..	..	..
43.	Lasbela ..	3.4	..	..	..	..	5.3	..	..	..
44	Makran	2.8	..	..	..	..	..	..	..	..
45	Karachi	..	..	..	..	..	..	..	..	—
	West Pakistan ..	9.3	5.4	7.0	8.9	10.4	5.3	4.3	2.5	31.5

Sources : 1. *Statistics of West Pakistan, Agricultural Data*—1958-59, Bureau of Statistics, Planning and development Department, Lahore, West Pakistan.

2. Data supplied by the Department of Agriculture, Lahore, Government of West Pakistan.

cropping have been marked in each case (Table 2). Ranking coefficient has been calculated by averaging all the ranks for each district. For example in the case of Peshawar district the ranks according to per acre yield of various crops are entered in columns 2 to 10 in Table2. In column 11 of the same table the ranking position of Peshawar district according to the intensity of cropping has been entered. The summation of the entries from column 2 to 11 is 111 which when divided by the number of cases (10) gives 11.1 as the ranking coefficient of Peshawar district. In the case of western hilly divisons of Quetta and Kalat, ranking

TABLE 2—RANKS ACCORDING TO CROP YIELDS IN MAUNDS/ACRE (AVERAGE 1953-54—1962-63)

Serial No.	District	Wheat	Gram	Barley	Rice	Maize	Jowar	Bajra	Cotton	Sugar cane	Ranks according to intensity of cropping	Ranking co-efficient
	1	2	3	4	5	6	7	8	9	10	11	12
1	Peshawar	12	22	4	18	10	1	18	13	15	7	11.1
2	Hazara	26	19	16	25	17	10	13	14	24	6	16.8
3	Mardan	14	21	2	6	3	3	..	12	10	10	8.9
4	Campbellpur	28	19	17	..	21	25	19	13	27	28	19.5
5	Kohat	29	24	20	19	11	22	8	..	27	18	19.6
6	Bannu	27	21	24	8	12	21	15	10	21	27	18.5
7	D. I. Khan	31	20	27	18	20	27	21	16	25	29	23.3
8	Mianwali	29	22	22	11	22	26	19	12	22	28	21.2
9	Rawalpindi	23	15	18	14	15	24	17	..	20	16	17.8
10	Jhelum	22	13	20	28	14	23	16	15	28	22	20.0
11	Sargodha	4	17	7	13	13	21	7	3	6	17	10.7
12	Gujrat	13	13	10	7	7	16	10	5	18	13	10.2
13	Sialkot	19	15	13	9	21	17	13	14	26	9	15.4
14	Gujranwala	6	8	11	4	9	15	9	7	19	14	10.1
15	Sheikhupura	7	9	11	7	12	16	7	7	21	11	10.7
16	Lahore	5	7	7	16	16	7	7	5	23	8	10.0
17	Montgomery	3	6	5	15	5	4	1	2	10	12	6.2
18	Lyallpur	1	2	2	10	4	22	3	1	9	15	6.7
19	Jhang	8	5	6	13	8	21	4	4	17	17	9.4

TABLE 2—*Continued*

Serial No.	District	Wheat	Gram	Barley	Rice	Maize	Jowar	Bajra	Cotton	Sugar-cane	Ranks according to intensity of cropping	Ranking co-efficient
	1	2	3	4	5	6	7	8	9	10	11	12
20	Multan ..	2	2	3	24	10	9	8	2	8	18	8.6
21	Muzaffargarh ..	14	14	14	23	18	12	9	11	22	20	15.5
22	D. G. Khan ..	14	20	17	29	6	19	17	12	25	25	18.9
23	Bahawalpur ..	9	5	10	17	19	8	6	6	14	19	11.1
24	Bahawalnagar ..	10	7	21	21	24	6	8	7	13	21	13.7
25	Rahimyar Khan..	7	9	8	17	23	9	5	3	16	29	12.6
26	Khairpur ..	16	8	8	6	34	5	7	7	5	14	10.9
27	Jacobabad ..	24	11	16	1	29	14	12	10	19	1	13.6
28	Sukkur ..	18	4	4	3	32	11	5	9	23	3	11.2
29	Nawabshah ..	17	23	23	11	27	2	2	5	3	24	13.6
30	Larkana ..	21	17	1	5	31	10	..	8	12	2	12.1
31	Sanghar ..	12	12	..	22	28	14	11	2	4	29	14.9
32	Tharparkar ..	15	3	25	24	32	18	22	2	1	30	17.1
33	Dadu ..	22	19	15	2	35	5	14	12	7	10	13.9
34	Hyderabad ..	11	16	19	20	30	26	5	2	2	29	15.9
35	Thatta ..	32	18	25	27	33	20	11	..	11	23	22.1
36	Quetta .	30	.	11	..	25	..	..	.	..	26	22.5
37	Zhob ..	34	..	9	..	24	..	..	..	..	27	22.5
38	Loralai ..	25	..	26	..	26	26	23	..	..	21	24.3
39	Sibi ..	26	10	19	12	17	10	20	..	..	18	16.3
40	Chagai ..	34	..	..	..	..	28	..	..	..	30	30.6
41	Kalat ..	22	..	12	26	..	..	..	..	..	32	22.5
42	Kharan ..	31	..	..	..	..	..	..	..	..	31	31.0
43	Lasbella ..	33	..	..	..	..	13	..	..	..	32	26.0
44	Makran ..	35	..	..	..	..	..	..	..	..	31	33.0

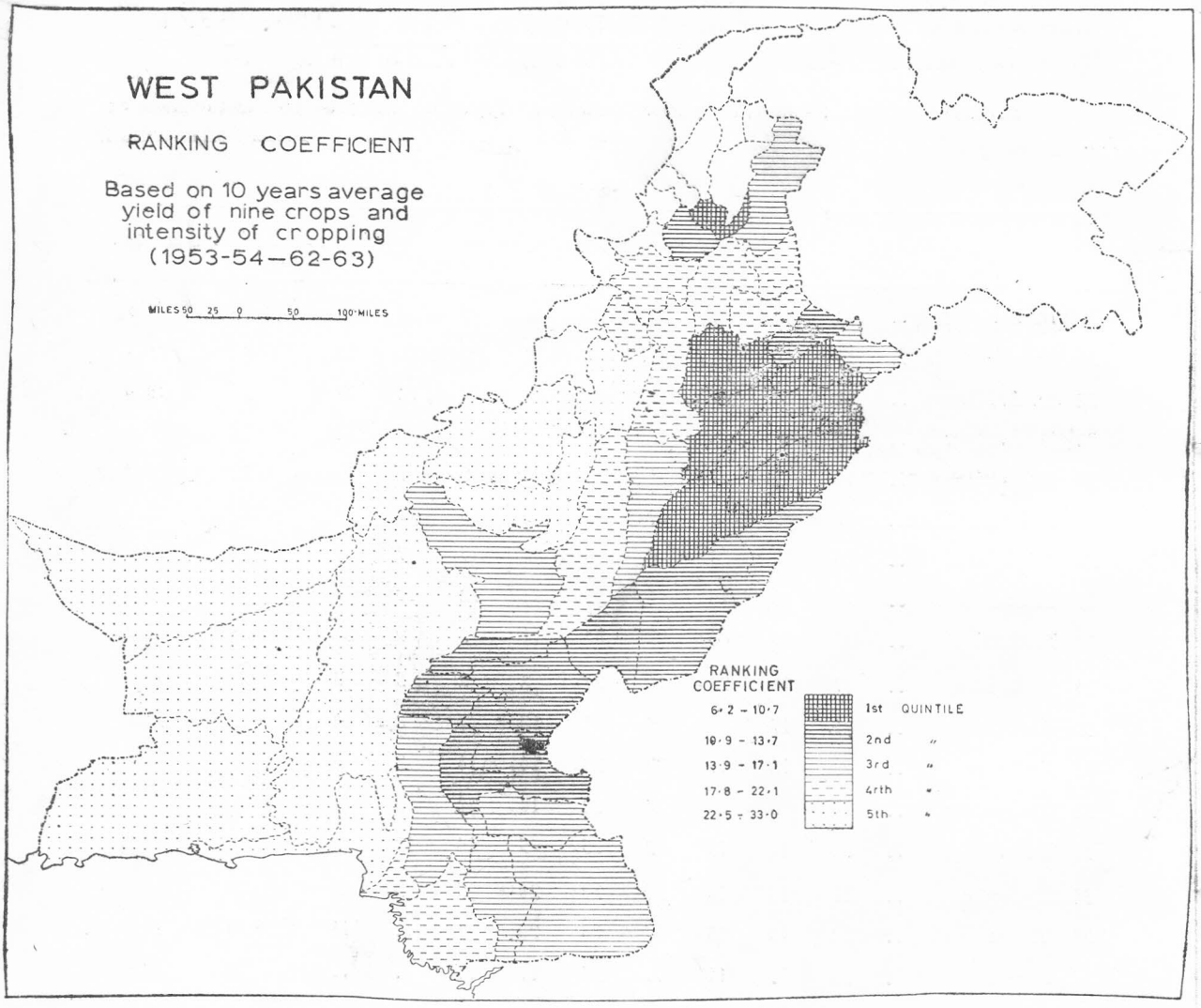

FIGURE 1

coefficient is based on the yields of only two crops which are grown there. The results have been plotted in quintiles[7] (Fig. 1).

Figure 2 shows the percentage deviation of crop yields on district basis assuming West Pakistan average yield (1953-54—62-63) for each crop to be 100. Percentage deviation of yield of nine crops has been calculated for all the districts. Finally these values have been averaged for each of the districts (Table 3). The areas of relative efficiency in West Pakistan have been shown by combining the results of the figures 1 and 2, taking

[7]By arranging all cases according to 'ranking coefficient, and dividing them into five equal parts,

into consideration both the ranking coefficient and percentage deviation (Fig. 3). The districts showing higher deviation are obviously the ones with lowest ranking coefficient. Tribal areas and Karachi are not included in the study for want of sufficient data.

It may, however, be pointed out that such a statistical method can sometimes be misleading unless it is supported by field studies. Familarity of the conditions in the area under study is indispensable for the best desired analysis and interpretations. It may also be mentioned here that the scrutiny of the available statistics is equally necessary.[8]

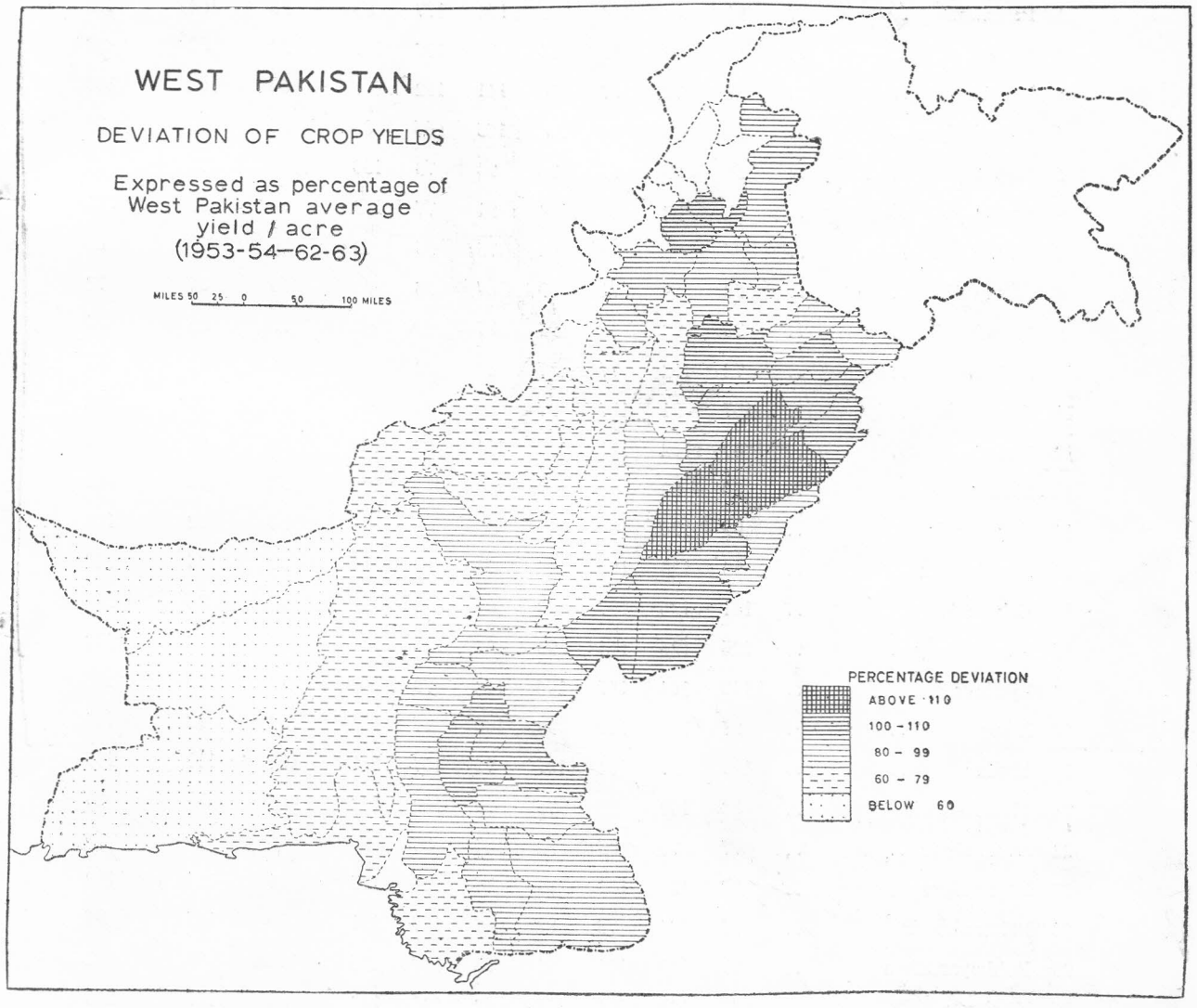

FIGURE 2

[8]While processing the statistical data for this study many of the published figures were found to be incorrect.

TABLE 3—PERCENTAGE DEVIATION OF CROP YIELDS (AVERAGE 1953-54—1962-63 = 100)

Serial No.	District	Wheat	Gram	Barley	Rice	Maize	Jowar	Bajra	Cotton	Sugar cane	Average deviation of all crops
	1	2	3	4	5	6	7	8	9	10	11
1	Peshawar	91	66	118	90	158	177	83	56	104	103
2	Hazara	66	83	89	74	80	105	107	52	82	82
3	Mardan	88	72	137	116	141	132	..	60	108	107
4	Campbellpur	59	83	84	..	155	66	83	56	73	82
5	Kohat	58	59	77	86	94	73	130	..	73	81
6	Bannu	60	72	67	112	91	77	102	66	85	81
7	D. I. Khan	56	76	59	90	75	55	72	36	79	66
8	Mianwali	58	66	71	99	67	58	83	60	84	72
9	Rawalpindi	70	98	83	95	87	69	90	..	86	84
10	Jhelum	72	102	77	57	88	72	95	48	62	75
11	Sargodha	107	91	107	97	89	77	134	100	121	102
12	Gujrat	89	102	101	114	101	92	120	88	91	99
13	Sialkot	80	98	94	108	72	89	107	52	79	86
14	Gujranwala	99	120	100	120	99	96	123	80	92	103
15	Sheikhupura	98	120	100	114	91	94	134	80	85	102
16	Lahore	101	126	107	92	84	113	134	88	83	103
17	Montgomery	126	126	114	93	105	126	186	104	108	122
18	Lyallpur	140	164	137	106	132	73	158	112	110	126
19	Jhang .. .	97	129	110	97	100	77	146	92	92	104
20	Multan	129	137	134	107	95	107	131	104	111	117
21	Muzaffargarh ..	88	100	93	75	79	102	122	64	83	89
22	D. G. Khan	77	76	85	52	104	85	90	60	79	79
23	Bahawalpur	95	129	101	91	77	106	135	84	104	102
24	Bahawalnagar ..	94	124	75	82	65	117	131	80	105	97
25	Rahimyar Khan ..	99	120	104	91	66	107	135	100	93	102
26	Khairpur	83	120	104	115	42	124	132	80	127	103
27	Jacobabad	68	113	85	132	50	98	116	66	91	91

TABLE 3—*Continued*

Serial No.	District	Wheat	Gram	Barley	Rice	Maize	Jowar	Bajra	Cotton	Sugar-cane	Average deviation of all crops
1	2	3	4	5	6	7	8	9	10	11	12
28	Sukkur	81	131	118	122	47	96	138	72	83	98
29	Nawabshah .. .	82	63	70	99	60	143	183	88	136	102
30	Larkana .. .	73	90	143	119	48	105	..	76	103	95
31	Sanghar	91	109	..	80	59	98	118	104	132	98
32	Tharparkar	86	78	65	107	47	87	65	104	120	89
33	Dadu .. .	72	83	91	125	40	124	104	60	119	91
34	Hyderabad	91	96	80	84	49	58	141	104	153	95
35	Thatta	50	89	65	58	43	83	118	..	107	78
36	Quetta .. .	57	..	100	..	63	..	.	..	..	73
37	Zhob .. .	33	..	103	..	65	.	.	..	..	67
38	Loralai .. .	68	..	64	..	61	58	70	..	..	6
39	Sibi .. .	65	114	80	98	80	105	76	..	..	88
40	Chagai .. .	33	..	..	..	..	27	.	..	..	30
41	Kalat .. .	72	..	95	70	..	..	..	..	..	79
42	Kharan	56	..	..	..	..	..	..	..	..	59
43	Lasbella	37	..	..	..	..	..	..	..	..	68
44	Makran	30	..	..	..	..	..	..	..	..	30
	West Pakistan ..	100	100	100	100	100	100	100	100	100	100

REGIONS OF AGRICULTURAL EFFICIENCY

Figure 3 brings out five distinct regions of varying agricultural efficiency in West Pakistan.

Region	*Ranking Coefficient*	*Percentage Deviation*
1) Region of Highest Efficiency ..	10 or under 10	Above 110
2) Region of High Efficiency ..	10.1-15	100-110
3) Region of Moderate Efficiency ..	15.1-20	80-99
4) Region of Low Efficiency ..	20.1-25	60-79
5) Region of Lowest Efficiency ..	Above 25	Under 60

Region of Highest Efficiency

It comprises six districts : Lahore, Montgomery, Multan, Lyallpur and Jhang in the Bari and Rechana Doabs of the Punjab Plains and Mardan in the north. These districts have a ranking coefficient of 10 or below 10 and a percentage deviation of crop yields above 110. The percentage deviation in Mardan is slightly below 110 (Fig. 2), but its ranking coefficient is 8.9 for which reason it has been included among areas of highest agricultural efficiency. Moreover, actual conditions have confirmed that it deserves to be grouped in a class higher than Peshawar.

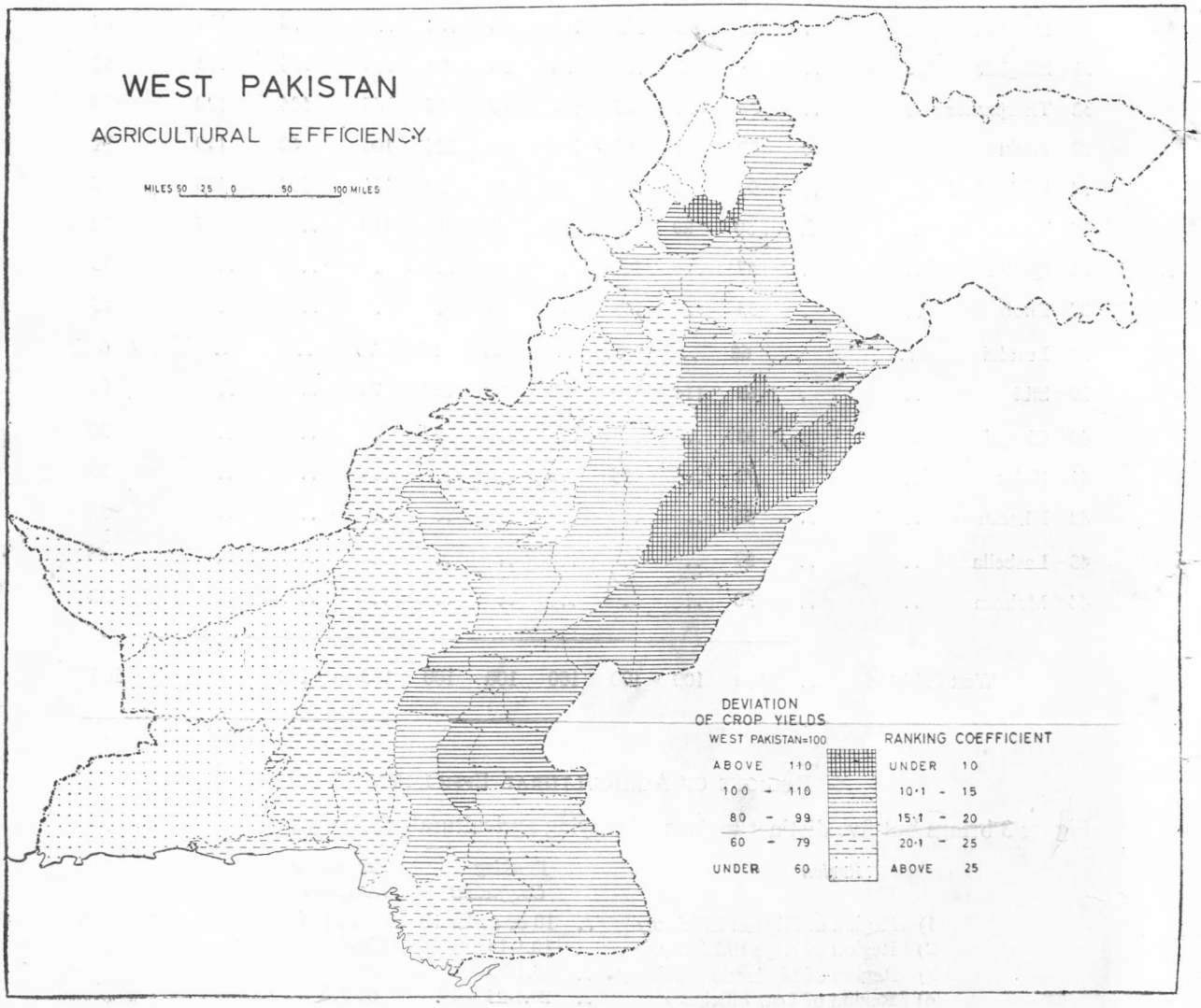

FIGURE 3

Region of High Efficiency

It includes Gujrat, Gujranwala, Sheikhupura and Sargodha districts of the Rechna and Chaj Doabs; Bahawalpur, Bahawalnagar and Rahimyar Khan districts in Bahawalpur Plain; and Sukkur, Jacobabad, Larkana, Nawabshah and Khairpur in the Upper Sind Plain. Most of these have a ranking coefficient between 10.1 and 15 and a percentage deviation between 100 and 110. However, a few exceptions had to be made. Gujrat, Larkana, Bahawalnagar, Jacobabad and Sukkur which have a percentage deviation slightly less than 100 but have a ranking coefficient much below 15, are included in this category.

Region of Moderate Efficiency

It covers the submontane districts of Hazara, Kohat, Bannu, Rawalpindi, Campbellpur, Jhelum and Sialkot in the north and west; Muzaffargarh in the southern part of Sind Sagar Doab and Dadu, Sanghar, Hyderabad and Tharparker in the Lower Sind Plain. This area of moderate efficiency has a ranking coefficient between 15.1 and 20, and a percentage deviation of crop yields between 80 and 99. Dadu and Hyderabad with a ranking coefficient of slightly less than 15 are included in this class because of the percentage deviatilon of much less than 100.

Region of Low Efficiency

This covers the largest area of all the regions. It comprises Quetta, Zhob, Loralai, Kalat, Lasbela, Dera Ismail Khan, Mianwali and Thatta districts. Here the percentage deviation of crop yields is between 60 and 79 and a ranking coefficient of 20.1 to 25. The only exception made is in the case of Lasbela, where the ranking coefficient of twenty-six is more than compensated by the percentage deviation much above sixty.

Region of Lowest Efficiency

The cultivated areas in Chagai, Kharan and Mekran show the lowest efficiency. Here the crop yields are lowest and the ranking coefficient above twenty-five.

Relationship of Efficiency With Physical and Non-Physical Factors

It is clear from the previous discussion that there are great variations in agricultural efficiency from one area to the other (Fig. 3). Sometimes contiguous areas show great differences in efficiency which could be accounted for by the differences in the landforms, soil, climate and other human and economic conditions that affect the intensity of land use and cropping. The relationship of these factors to the agricultural efficiency in each of the five regions has been brought out in detail.

Region of Highest Efficiency

This region forms the 'agricultural heartland' of West Pakistan (Fig. 3). The whole area is conspicuous for the great intensity of land use and cropping (Fig. 4.) The cultivated

area in all these districts ranges from sixty-five to seventy-eight per cent of the total geographical area, the highest being in Lyallpur (Table 4). The intensity of land use is further evident from the relatively low percentage of land left fallow which varies from 5.7 per cent in Lyallpur to 13.4 per cent in Mardan. The intensity of cropping varies from nineteen to thirty-four per cent. The extent of culturable waste is small in all these districts, except Jhang where still twenty-five per cent of the area can be added to the existing cultivated land.

The area produces a variety of cereals and cash crops. Wheat, gram and fodder are the chief *rabi* crops, whereas cotton, sugarcane, maize, rice and tobacco are the main crops grown in *kharif* (Table 10).

The high intensity of land use and cropping and the high yields have been possible in this heartland because of several favourable factors.

The greater part of this region in the Punjab Plains is comprised of the southern Rechna Doab (Jhang and Lyallpur) and whole of Bari Doab (Lahore, Montgomery and Multan). Most of the area is built of old and new alluvium with almost nothing to distrurb the monotony of relief. Low sand dunes are found only in those parts of the interfluve where irrigation facilities have not been extended yet. Shallow basins, sand bars and other riverain features formed by extensive sheet floods, are found in the cover flood plains[9] of Ravi and Chenab. Generally there is considerable uniformity of soil texture from scalloped interfluves,[10] in the central parts of Doabs to the cover flood plains on the margins. The soils vary from moderately coarse to medium-textured with silt and sand as the predominent constituents. Only in the meander[11] and active flood plains[12] which are confined to a relatively narrow zone along the rivers, soils are relatively fine-textured.

The rainfall received within this area varies from five to twenty inches from south-west to north-east, and a greater part of it falls during the summer months of June to September. The high thermal efficiency in all seasons, and high evapotranspiration results in water deficiencies to the amount of 100 to 130 cms. (Fig. 7).[13] This necessitates the supply of irrigation water both in *rabi* and *kharif* for better returns.

The almost level land and naturally fertile soils have been very responsive to the advantages of copious perennial irrigation. Figure 4 shows that there is hardly any notice-

[9]The flood plain long abandoned by rivers.

[10]Exiremely level plains with almost no traces of meanders or sheet floods.

[11]Recently abandoned active flood plains.

[12]'Bet' lands lying adjacent to rivers usually inundated during summer.

[13]K. S. Athmad and M. L. Khan, "Variation of Moiture Types and Their Bearing on Soil Erosion in West Pakistan", *Pakistan Geographical Review*, Vol. 14, No. 1 (1959) pp. 1—13.

TABLE 4—INTENSITY OF LAND USE AND CROPPING (AVERAGE 1958-59—62-63)

Seria No.	District	Culturable waste (percentage of the total geographical area)	Total cultivated (percentage of the total geographical area)	Fallow (percentage of the total cultivated)	Net sown (percentage of the to al cultivated)	Intensity of cropping	Irrigated (percentage of the total sown)
1		2	3	4	5	6	7
1.	Peshawar ..	23.6	47.3	5.7	94.3	135	95.3
2.	Hazara ..	51.1	28.9	6.8	93.2	137	15.2
3.	Mardan ..	5.1	69.4	13.4	86.6	132	91.2
4.	Attock ..	7.2	41.4	9.1	90.9	107	6.7
5.	Kohat ..	9.8	20.1	6.4	93.6	119	13.5
6.	Bannu ..	20.7	48.1	13.4	86.6	108	35.6
7.	D I. Khan ..	46.6	26.6	25.4	74.6	105	29.1
8.	Mianwali ..	28.4	47.9	14.0	86.0	107	21.8
9.	Rawalpindi ..	8.5	50.5	10.4	89.6	122	2.7
10.	Jheum ..	10.3	39.4	5.9	94.1	115	4.4
11.	Shahpur ..	16.7	65.4	3.8	96.2	120	61.4
12.	Gujrat ..	12.0	73.5	1.9	98.1	126	47.5
13.	Sialkot ..	3.9	81.1	4.6	94.4	133	41.7
14.	Gujranwala ..	22.4	65.3	8.5	91.5	125	104.6
15.	Sheikhupura ..	26.7	63.3	10.2	89.8	129	100.0
16.	Lahore ..	10.0	67.5	11.2	88.8	134	47.3
17.	Montgomery ..	14.7	73.5	10.8	89.2	127	105.8
18.	Lyallpur ..	12.7	78.3	5.7	94.3	124	113.8
19.	Jhang ..	25.5	65.5	10.1	89.9	120	90.7
20.	Multan ..	16.5	69.9	9.8	90.2	119	111.3
21.	Muzaffargarh ..	53.1	29.7	14.6	85.4	117	82.5
22.	D. G. Khan ..	16.5	24.2	54.7	45.3	110	62.2
23.	Bahawalpur ..	3.1	12.2	11.5	88.5	118	96.1
24.	Bahawalnagar ..	11.8	55.7	9.0	91.0	116	93.1

TABLE 4—*continued*

Serial No.	District	Culturable waste (percentage of the total geographical area)	Total cultivated (percentage of the total geographical area)	Fallow (percentage of the total cultivated)	Net sown (percentage of the total cultivated)	Intensity of cropping	Irrigated (percentage of the total sown)
1		2	3	4	5	6	7
25.	Rahimyar Khan ..	12.3	43.2	0.9	99.1	118	108.1
26.	Khairpur ..	5.2	15.3	26.2	73.8	125	93.7
27.	Jacobabad ..	16.0	74.0	45.9	54.1	157	93.7
28.	Sukkur ..	14.1	34.0	45.3	54.7	141	124.4
29.	Nawabshah ..	4.1	58.7	28.9	71.1	112	86.0
30.	Larkana ..	8.7	51.1	39.0	61.0	154	105.9
31.	Sanghar ..	8.7	37.9	35.1	64.9	105	99.4
32.	Tharparkar ..	11.5	34.0	39.8	60.2	102	99.3
33.	Dadu ..	26.6	18.3	47.7	52.3	132	99.0
34.	Hyderabad ..	18.7	56.2	40.9	59.1	105	100.0
35.	Thatta ..	29.8	14.3	49.5	50.5	113	91.9
36.	Quetta ..	5.0	8.1	62.9	37.1	109	67.2
37.	Zhob ..	0.7	1.2	54.7	45.3	108	28.1
38.	Loralai ..	6.3	4.2	39.4	60.6	116	23.7
39.	Sibi ..	1.9	3.6	77.2	22.8	119	39.0
40.	Chagai ..	28.1	1.0	56.0	44.0	102	25.0
41.	Kalat ..	0.002	0.39	19.5	80.5	100	..
42.	Kharan ..	0.005	0.4	27.3	72.7	101	..
43.	Lasbella ..	90.7	3.2	68.5	31.5	100	..
44.	Makran ..	0.6	0.4	25.9	74.1	101	..
45.	Karachi ..	..	..	..	..	140	..
	West Pakistan ..	13.6	22.7	21.6	78.4	120	80.2

Sources :

1. *Statistics of West Pakistan Agricultural Data*, 1958,59, Lahore, West Pakistan, Bureau of Statistics, Planning and Development Department.
2. *Pakistan Census of Agriculture*, Vol. 2, 1960.
3. Data supplied by the Department of Agriculture, Lahore, Government of West Pakistan.

able dry-cropped area in all these districts except Jhang. The extent of irrigated area varies from 90 to 113 per cent of the net sown area. The shortage of water supply during winter from the Dipalpur and Upper Bari Doab canals in Lahore and Multan is to some extent made up by irrigation from wells but result is lesser intensity of land use during that period.

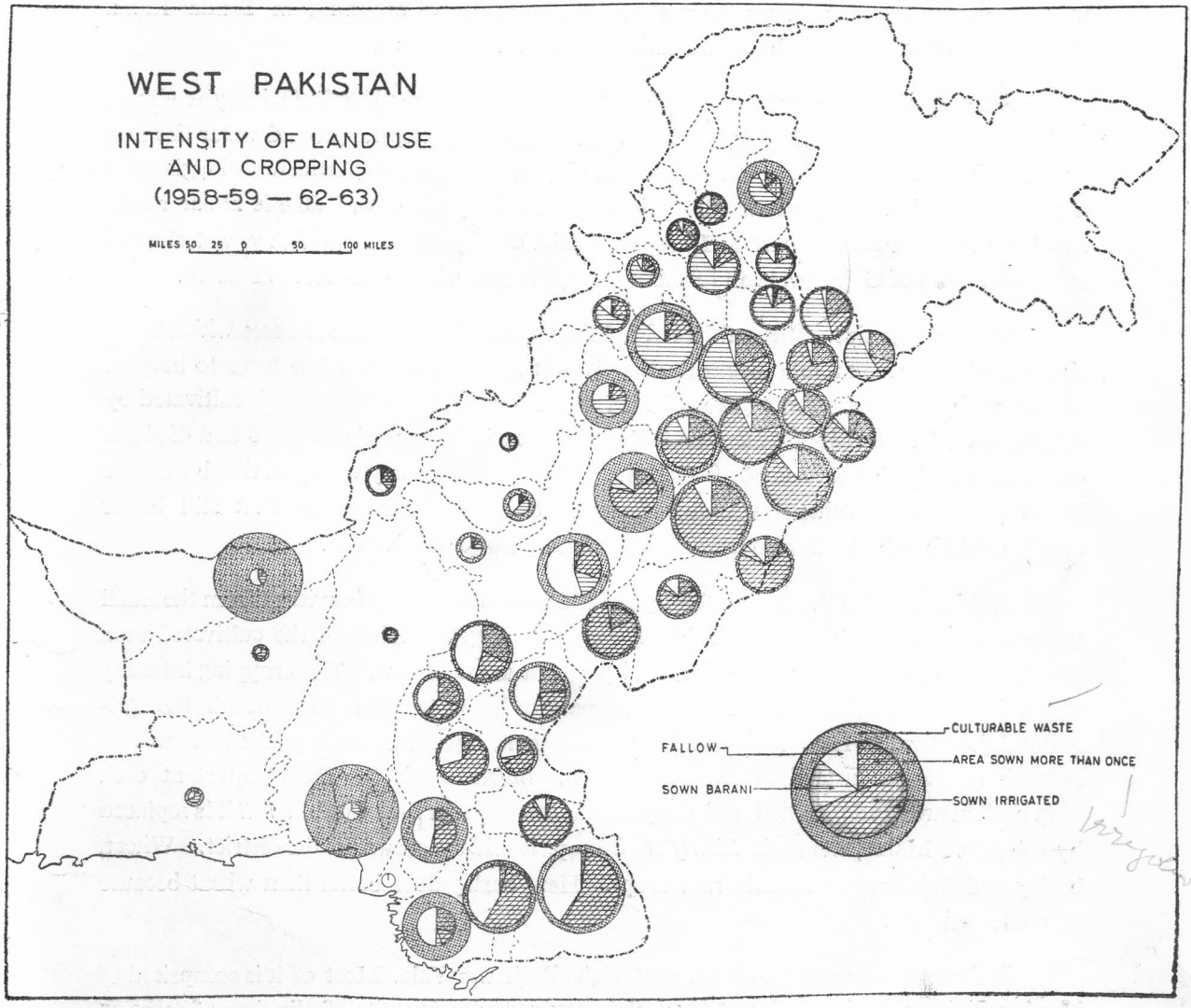

FIGURE 4

Detailed study of cropping pattern in these areas have revealed that fodder, fruits and vegetables occupy about one-thirds of the total cropped area. This in association with exceptionally large number of livestock holdings improves the fertility of the soil. Livestock provide large quantities of cow-dung and urea which are supposed to be very effective fertilizers. Fodder crops like berseem and shaftal fit in the crop rotation during winter, yield at least two to three cuttings and also provide green manure.

The high degree of urbanisation in this region has also a great impact on the intensity and pattern of cropping. Vegetable farming on the intensively cultivated land and fruit culture are the main characteristics of the land use around large cities like Lahore, Multan and Lyallpur. Intensity of cropping higher than 150 per cent have been recorded in such areas. Figure 8 shows the pattern and intensity of cropping in Sanda Kalan and Sanda Khurd located about two miles north-west of Lahore.

Another important factor contributive to the high agricultural efficiency is almost entire freedom from waterlogging and salinity. In most parts, the ground water lies at a depth of about fifteen feet or more. There are only two areas where partial waterlogging and high concentration of salts have affected the productivity of land. One is in Jaranwala *tehsil* in the north-eastern part of Lyallpur district contiguous to the highly waterlogged and saline areas of Gujranwala and Sheikhupura, the other lies south-west of Lahore.

The average size of the cultivated holdings varies from 5.1 to 9.3 acres which in the absence of any accountable mechanization is neither too small nor too large to become unmanageable or uneconomic (Table 6). More than one-thirds of the land is cultivated by tenants (Fig. 5). In Montgomery and Multan the ratio is even higher (58.6 and 49.4 per cent respectively) but it has not affected the agricultural efficiency to any noticeable degree in the presence of other favourable factors. However, it is certain that still better results could be obtained from the same area under owner cultivation.

In Mardan also the great intensity of land use and cropping is evident from the small percentage of culturable waste (Table 4) and a high proportion of the cultivated area amounting to 69.4 per cent of which 13.4 per cent is left fallow. The cropping intensity of 113 is a common feature. The cropping pattern however differs from that in the agricultural heartland. Here maize and sugarcane fields are the most important features of summer landscape instead of rice and cotton. Sugarcane is the most important cash crop both in area and production. Only in the eastern part of the Swabi *tehsil* it is replaced by tobacco. Maize, the main *kharif* food crop, is widely grown in the district. Wheat, barley and fodder are the main *rabi* crops. Here barley does better than wheat because of cooler winters.

It forms the most prosperous part of the Peshawar Vale. Most of it is comprised of Mardan Plain which is an almost level plain covered with deposits of alluvium of more or less uniform texture. Light brown sandy loam covers the greater part of this plain. Only in the piedomont zone in the north and Sar-i-Mar ridge in the east, soils are rather coarse-textured.

Perennial irrigation is provided to 91.4 per cent of the net sown area from the Upper Swat, Lower Swat and Abazai canals. In Swabi *tehsil*, well irrigation is the pre-dominant

TABLE 5

Serial No.	District	Area under Fruits (percentage of net sown area)	Area under vegetables (percentage of net sown area)	Area under Fodder crops (percentage of the net sown)
1.	Peshawar	2.2	1.6	18
2.	Hazara	0.2	0.4	12
3.	Mardan	1.1	0.9	11
4	Campellpur	0.01	0.04	15
5.	Kohat	0.1	0.1	12
6.	Bannu	0.2	0.2	21
7.	D. I. Khan	0.6	..	12
8.	Mianwali	0.05	4.3	21
9.	Rawalpindi	0.4	0.5	14
10.	Jhelum	0.08	0.3	11
11.	Sargodha	1.2	0.4	29
12.	Gujrat	0.7	0.6	22
13.	Sialkot	0.4	0.8	18
14.	Gujranwala	0.1	2.3	21
15.	Sheikhupura	0.5	0.3	24
16.	Lahore	0.3	1.24	34
17.	Montgomery	1.1	0.5	39
18.	Lyallpur	0.5	0.6	28
19.	Jhang	0.1	0.2	28
20.	Mutan	1.0	0.6	28
21.	Muzaffargarh	0.7	0.4	26
22.	D. G. Khan	0.3	0.3	20
23.	Bahawalpur	0.9	0.6	24
24.	Bahawalnagar	0.5	0.7	21
25.	Rahimyar Khan	1.0	0.5	21
26.	Khairpur	1.9	1.2	22
27.	Jacobabad	0.04	0.2	39
28.	Sukkur	0.9	0.9	9

TABLE 5—*Continued*

Serial No.	District	Area under Fruits (percentage of net sown area)	Area under vegetables (percentage of net sown area)	Area under Fodder crops (percentage of the net sown)
29.	Nawabshah	1.4	0.09	25
30.	Larkana	0.9	0.6	21
31.	Sanghar	0.2	2.2	22
32.	Tharparkar	0.5	0.1	25
33.	Dadu	0.05	..	26
34.	Hyderabad	2.1	2.0	21
35.	Thatta	0.6	2.2	18
36.	Quetta	6.6	4.2	10
37.	Zhob	4.1	6.1	7
38.	Loralai	2.0	0.3	8
39.	Sibi	1.1	0.3	18
40.	Chagai	0.1	..	17
41.	Kalat	4.4	..	10
42.	Kharan	5.3	..	..
43.	Lasbella	1.0	2.6	18
44.	Makran	7.0	..	27
	West Pakistan ..	..	..	25

Sources : 1. *Pakistan Census of Agriculture*, Vol. 2, 1960.
2. Data supplied by the Department of Agriculture, Lahore : Government of West Pakistan.

feature of the intensively cultivated fields. Recently it has been supplemented by canal irrigation. Dry-cropping is practised only in the south-eastern part.

Unlike the agricultural heartland, the area under fodder crops occupies only eleven per cent of the cropped area. The natural high fertility of the soil has been partly maintained by leaving the land fallow and partly by relatively higher use of chemical fertilizers on account of the great incentive of higher yields of sugarcane and tobacco, the two important cash crops.

Region of High Efficiency

This region covers a very large area extending from the Peshawar Vale and parts of Rechna, Chaj and Sind Sagar Doabs to the northern part of the Lower Sind Plain with Bahawalpur, Bahawalnagar and Rahimyar Khan in the middle. For differences in the conditions and cropping patterns, the area is divided into three sections for detailed study.

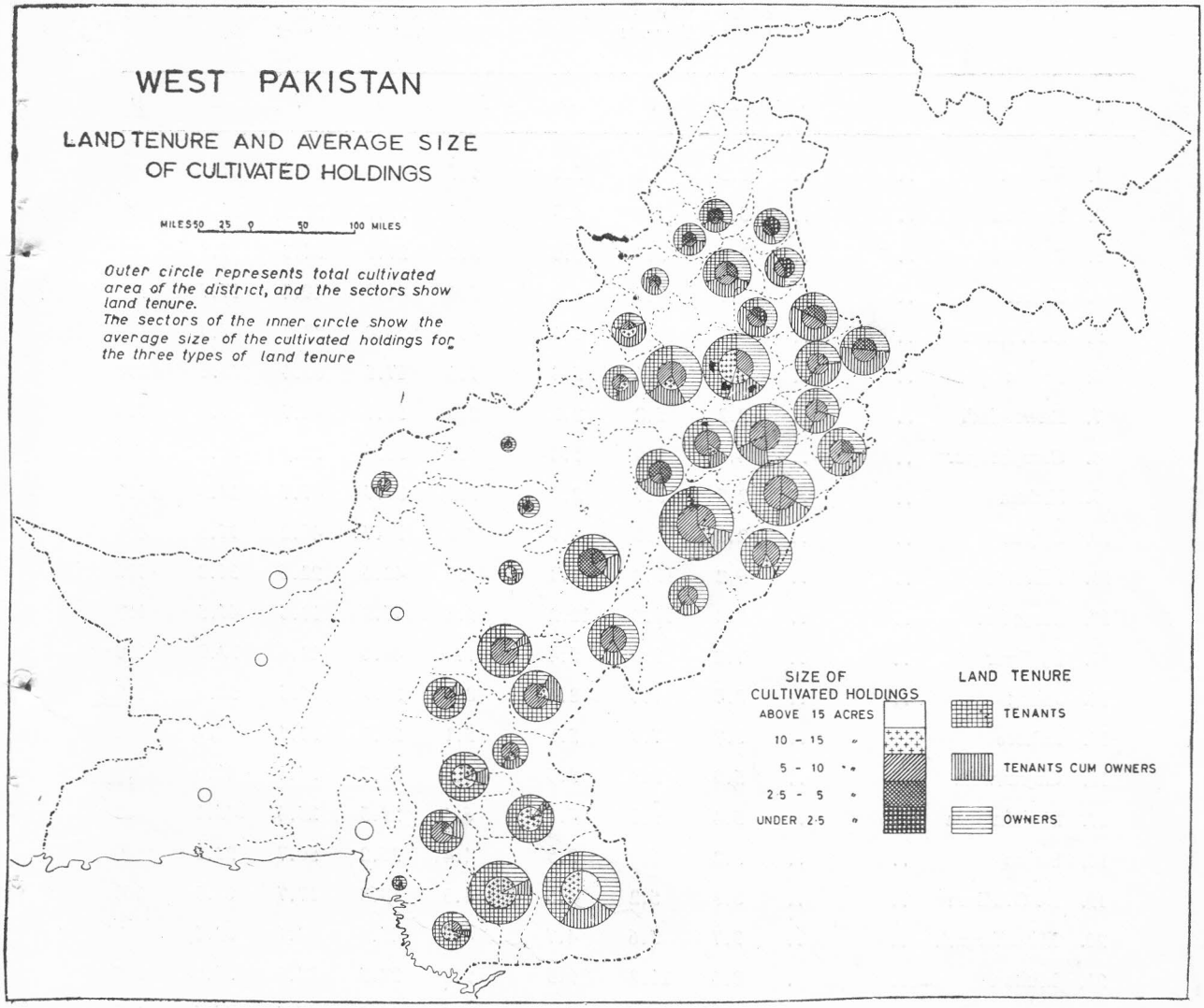

FIGURE 5

a) Peshawar district in the north, though contiguous to Mardan, shows lower agricultural efficiency because of the differences in terrain, soil and irrigation facilities. Most of it lies outside the fertile Peshawar Vale. The piedmont zone in the south-west of the

TABLE 6—AVERAGE SIZE OF CULTIVATED HOLDINGS AND LAND TENURE IN WEST PAKISTAN

Serial No.	District	Size of holdings by types (in acres)			Total cultivated holding	Cultivated land operated by types of holdings (as percentage of the total cultivated)			
		Owner cultivator	Owner-cum-Tenants	Tenants		Owner cultivator	Owner-cum-Tenant	Tenants	Total
1		2	3	4	5	6	7	8	9
1.	Hazara	1.3	3.1	2.0	1.7	46.8	28.3	24.9	100
2.	Mardan	3.9	7.0	4.3	4.7	33.7	31.3	35.0	100
3.	Peshawar	2.5	5.3	3.6	3.6	27.9	34.3	37.8	100
4.	Kohat	4.7	8.7	4.8	5.8	41.9	40.4	17.7	100
5.	D. I. Khan	5.9	14.1	8.0	8.4	23.4	28.7	47.9	100
6.	Bannu	3.6	14.4	5.4	7.5	17.5	59.4	23.1	100
7.	Rawalpindi	2.2	5.2	2.3	2.9	50.0	40.7	9.3	100
8.	Campbellpur	4.5	9.9	5.8	6.3	30.5	38.9	30.6	100
9.	Jhelum	2.5	5.7	2.9	3.5	37.7	47.7	14.9	100
10.	Gujrat	2.8	6.3	3.7	4.0	36.7	46.0	17.3	100
11.	Mianwali	9.2	13.8	9.8	10.2	42.6	22.6	34.8	100
12.	Sargodha	8.8	11.5	10.2	9.8	35.9	18.6	45.5	100
13.	Lyallpur	7.2	9.9	8.4	7.9	49.4	18.6	32.0	100
14.	Jhang	8.7	11.4	8.4	8.9	33.9	15.5	50.6	100
15.	Lahore	3.7	7.9	5.1	5.1	26.8	32.5	40.7	100
16.	Gujranwala	5.9	9.3	5.6	6.6	23.7	35.3	41.0	100
17.	Sheikhupura	5.4	9.1	6.1	6.4	29.5	25.4	45.1	100
18.	Sialkot	3.2	6.5	3.5	4.4	26.2	50.7	23.1	100
19.	D. G. Khan	3.3	5.2	4.5	4.3	18.8	17.7	63.5	100
20.	Muzaffargarh	3.7	5.6	4.7	4.3	45.4	22.1	32.5	100
21.	Multan .. .	8.4	11.8	9.5	9.3	28.5	12.6	58.6	100
22.	Montgomery . .	6.2	10.0	8.6	7.8	33.2	17.4	49.4	100
23.	Bahawalpur	6.8	9.7	8.6	7.9	39.3	19.2	41.5	100
24.	Bahawalnagar	9.1	12.6	9.7	9.7	42.5	13.2	44.3	100
25.	Rahimyar Khan ..	5.4	8.7	7.4	6.5	45.4	13.2	41.4	100

TABLE 6—*continued*

Serial No.	District	Size of holdings by types (in acres)			Total cultivated holding	Cultivated land operated by types of holdings (as percentage of the total cultivated)			
		Owner cultivator	Owner-cum-Tenants	Tenants		Owner cultivator	Owner-cum-Tenant	Tenants	Total
1		2	3	4	5	6	7	8	9
26.	Hyderabad	14.1	20.8	12.2	12.9	17.5	9.2	73.3	100
27.	Dadu	5.2	16.7	9.9	9.6	12.0	18.1	69.9	100
28.	Sanghar	16.9	19.4	12.9	13.4	9.9	4.8	85.3	100
29.	Tharparkar	16.6	34.8	13.7	17.2	35.1	23.3	41.6	100
30.	Khairpur	8.5	12.4	8.6	9.2	34.2	23.4	42.4	100
31.	Jacobabad	10.0	16.4	9.8	10.0	13.5	5.1	81.4	100
32.	Nawabshah	12.4	15.2	10.9	11.5	18.6	11.6	69.8	100
33.	Sukkur	5.0	12.2	7.9	8.1	8.8	21.1	70.1	100
34.	Larkana	6.0	9.8	7.6	7.6	9.6	10.3	80.1	100
35.	Sibi	12.7	29.5	15.1	15.3	26.7	13.2	60.1	100
36.	Loralai	4.0	10.0	5.8	4.8	61.2	16.4	22.4	100
37.	Zhob	3.1	5.5	9.6	3.8	66.1	12.9	21.0	100
38.	Quetta	7.3	11.3	13.6	9.1	54.6	13.8	31.6	100
39.	Karachi	10.9	20.3	17.5	14.6	37.0	14.4	48.6	100
	West Pakistan ..	5.2	8.8	7.6	7.8	31.7	23.1	45.2	100

Source : *Pakistan Census of Agriculture* 1960, Vol. 2 (Karachi; Ministry of Food and Agriculture).

district and the hilly area of Nowshera *tehsil* limits the cultivation to less than half of the total area. The piedmont zone is built of coarse-textured deposits of the alluvial fans. The piedmont plain between the cover flood plains of Kabul and the piedmont zone, is covered with outwash material which is not so productive. This whole area suffers from the ravages of the seasonal streams which frequently change their courses.

Except in the irrigated parts of Peshawar Vale and the northern part of the piedmont plain, moisture for the summer crops is not sufficient. Wheat, barley and fodder occupy the greater part of the sown area in winter. Maize, sugarcane and cotton are the crops grown in summer only on the perennially irrigated land. However, great intensity of cropping

is achieved in the area between Peshawar and Nowshera, which grows much of the vegetables and fruits for the nearby urban markets in Peshawar and Nowshera.

Besides the roughness of terrain, the small size of the cultivated holdings of under four acres and a relatively high proportion of land cultivated by tenants contribute to the relatively lower efficiency than in Mardan (Fig. 5).

b) Four districts (Sargodha, Gujrat, Gujranwala and Sheikhupur) are included in the northern parts of the Chaj and Rechna Doabs. This part is similar to the agricultural heartland regarding soil and intensity of land use. All these districts have a cultivated area ranging from 63.3 to 73.5 per cent and a cropping intensity between 120 and 130 per cent. The only area that differs in soil texture is the Himalayan Piedmont zone that covers the north-eastern part of Gujrat. Here coarse-textured soil replaces the medium-textured soils of the scalloped interfluves and cover and meander flood plains.

The main feature of the area is the perennial and non-perennial irrigation supplemented by well irrigation especially during winter. The canal water is sparingly supplied during winter months for the danger of spreading waterlogging and salinity. The ratio of irrigated land varies greatly from 41.7 per cent in Gujrat to 104 per cent in Gujranwala. In Gujrat a substantial proportion of the sown area is dry-cropped.

Rice, cotton, sugarcane and fodder are the main *kharif* crops; wheat, millets and gram are widely grown in *rabi*. Fodder crops which occupy between twenty-one to twenty-nine per cent of the total cropped acreage give a better crop rotation. Figure 9 shows the land use pattern near Sargodha which is fairly a good representative of the type in canal irrigated areas of the region.

Waterlogging and salinity are the great problems of this area. Eastern part of Sargodha, south-western part of Gujrat, and a greater part of Gujranwala and Sheikhupura are most severely affected by waterlogging and salinity.[14] The damage done can be seen from the much lowered yield of some crops. Wheat and cotton are adversely affected crops in almost all these districts. Wheat yields have gone down by six to twelve per cent since 1936-37, when waterlogging and salinity were not widespread. In Sheikhupura, even rice which is more tolerant of salinity shows a decrease of fourteen per cent in its yield during the same period (Table 7). Cotton yields also show the same downward trend.

But for the adverse effects of waterlogging and salinity which have negated all the favourable physical, economic and human factors the area could have compared favourably with the agricultural heartland in its agricultural efficiency.

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[14]Waer and Power Development Authority, *Working Paper on Waterlogging and Salinity in West Pakistan* (Lahore: Government of West Pakistan, 1964) Plates 1 and 2.

c) The third section of the region comprises Bahawalpur, Bahawalnagar and Rahimyar Khan. This is a far less extensively and intensively cultivated area in contrast to the one already discussed. About half of the total area is under plough in Bahawalnagar and Rahimyar Khan districts whereas in Bahawalpur, where Thar desert encroaches on the meander flood plains of Sutlej, only twelve per cent of the total area is cultivated. The intensity of cropping shows that only sixteen to eighteen per cent of the cropped area is sown more than once.

TABLE 7—PERCENTAGE DEVIATION OF CROP YIELDS IN AREAS AFFECTED BY WATERLOGGING AND SALINITY BETWEEN 1936-37—61-62

District	Crop		
	Wheat	Rice	Cotton
1	2	3	4
Sheikhupura	—12	—14	—16
Gujranwala	—11	+1.3	—11
Sargodha	—6	+7	+17
Gujrat	—22	—3	No Change
Sukkur	—18	+13	—49
Jacobabad	—10	—17	—37
Larkana	—28	No change	—29
Nawabshah	—32	—40	—18
Hyderabad	—26	—40	—8

Much of the area in the flood plains is built of the alluvial deposits of Sutlej. The southern part is a rolling sandy plain with sand dunes and sand hills as the only feature of landscape. All the cropped area is perennially and non-perennially irrigated. Very low rainfall of under ten inches with a high thermal efficiency at all seasons results in great water deficiency which makes dry cropping impossible. More drought resistant crops like gram, oilseeds, and pulses are grown in areas of precarious irrigation. In the perennially irrigated areas cotton is the most important cash crop and is grown in rotation with wheat and fodder. The area is almost free from waterlogging and salinity except in the eastern part of Bahawalnagar. Limited water supply especially during winter greatly restricts the intensity of cropping.

d) Most of the upper part of Sind Plains constitutes the meander and cover flood plains of the Indus. Soil texture varies from coarse to medium. Almost all the sown area is irrigated by perennial and non-perennial canals. Large areas are left fallow because

of the paucity of perennial water supply in parts of Larkana, Jacobabad and Sukkur. Inundation canals supply water only during the summer months. Autumn watering, however, supplies enough moisture for the *rabi* sowing. This situation is likely to change as the non-perennial canals are to be linked with the Gudu Barrage.

Cotton, millets, rice and sugarcane are the chief summer crops; wheat, gram and fodder are grown in winter. Rice is the most important crop in Jacobabad and Sukkur both in area and production. The land use becomes distinctly intensive near urban centres where vegetables and fruit orchards occupy a substantial proportion of the cropped area.

The productivity is, however, adversely affected by more than one factor. Water-logging and salinity are prominent in Jacobabad and Larkana. Fallow land is usually affected by *kallar*.

The area is the hottest part of West Pakistan with lowest annual rainfall of under five inches (Fig. 6). The water deficiency is greatest here more than 140 cms (Fig. 7). Much more water is, therefore, needed to attain higher efficiency. Moreover, copious irrigation at all seasons shall help in draining the salts to lower soil horizons.

The land tenure map shows that a much larger proportion of the cultivated area is held by tenants. This factor also contributes to lower efficiency than otherwise possible (Table 6).

Region of Moderate Efficiency

It covers a very large part of West Pakistan. Though great diversity of landforms, climate and the land use patterns from the submontane areas in the north to the Lower Sind Plain in the south is met with in this region, relatively lesser intensity of land use and cropping and large extent of fallows and culturable waste are common to all parts. The area is divided into three parts with distinctly different characteristics :

a) The submontane area in the north includes the districts of Hazara, Bannu, Kohat, Campbellpur, Rawalpindi, Jhelum and Sialkot.

Generally speaking, rough terrain limits the cultivated area in most of these districts to the valleys and a few sizeable plains. Large areas of cultivated land alternate with vast stretches of hilly and unused parts. Only in Rawalpindi and Sialkot districts the cultivated area becomes relatively extensive. Irrigation facilities are limited. Small stretches of land are irrigated by diverting stream and torrent water with the help of small inexpensive *bunds* (dikes). Comparatively higher rainfall in most parts except in southern Bannu allows *barani* (depending on rainfall) cultivation over vast areas. Over most of the area wheat, gram and oilseeds are commonly grown in winter and *jowar* and *bajra* in summer. On

the irrigated patches maize, sugarcane and rice are grown in summer and wheat and fodder in winter. Agriculture is precarious and failure of crops are associated with the failure of rainfall.

In Bannu relatively higher proportion of cultivated land is due to the large extent of rolling plains. Bannu Doab consists of fine-textured river alluvium and exhibits high intensity of land use and cropping. It is perennially irrigated by canals but the area under summer crops is much less than under winter crops for want of adequate water supply. Some dry-cropping is practised in the southern part of the Doab and in the sandy plains of Lakki and Marwat.

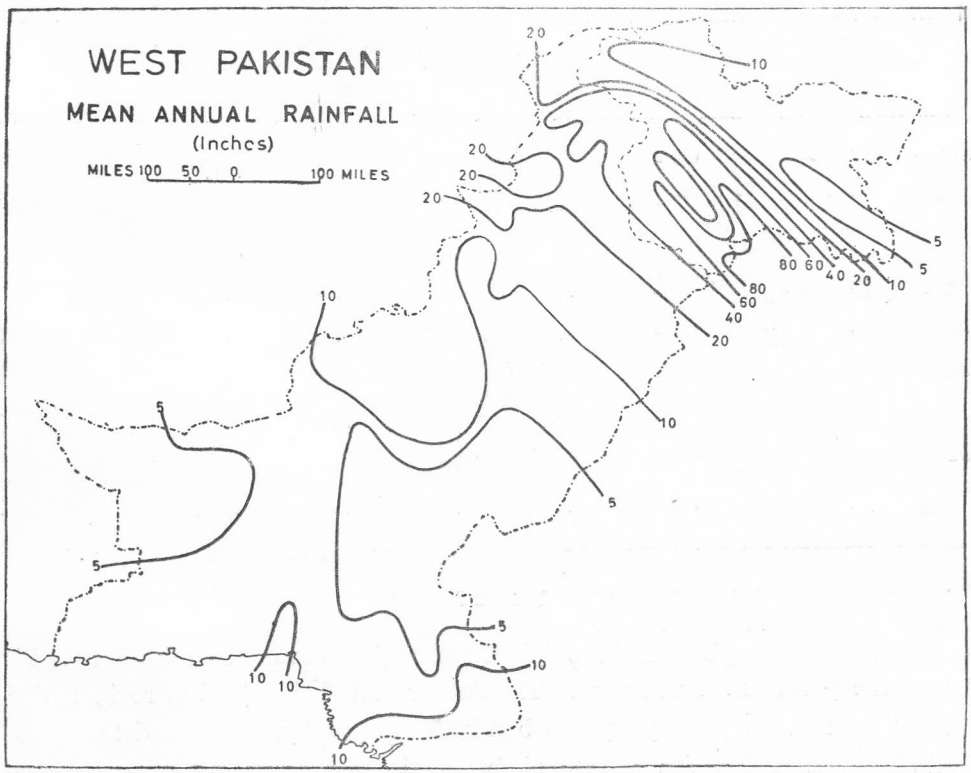

FIGURE 6 *After K. S. Ahmad and M. L. Khan*

Kohat is a hilly district badly dissected with only a few valley plains. Most of the cultivated area lies in Miranzai plain, Kohat plain, Teri-toi plain and Chantra plain. Small dams are constructed to divert the stream water for irrigation. Most of the cultivated area is dry-cropped. Lack of water supply is the main cause of low returns.

In Hazara, too, less than one-thirds of the total land is cultivated, which is limited to the lower slopes and narrow valley bottoms and a few sizeable plains. Direct irrigation

from streams and high summer rainfall allows the widespread cultivation of maize and some rice (Fig. 10), winters are too cold for large scale cultivation of wheat.

Most of the area is owner cultivated but the holdings are too small (under 2 acres) to promote greater efficiency (Fig. 5.).

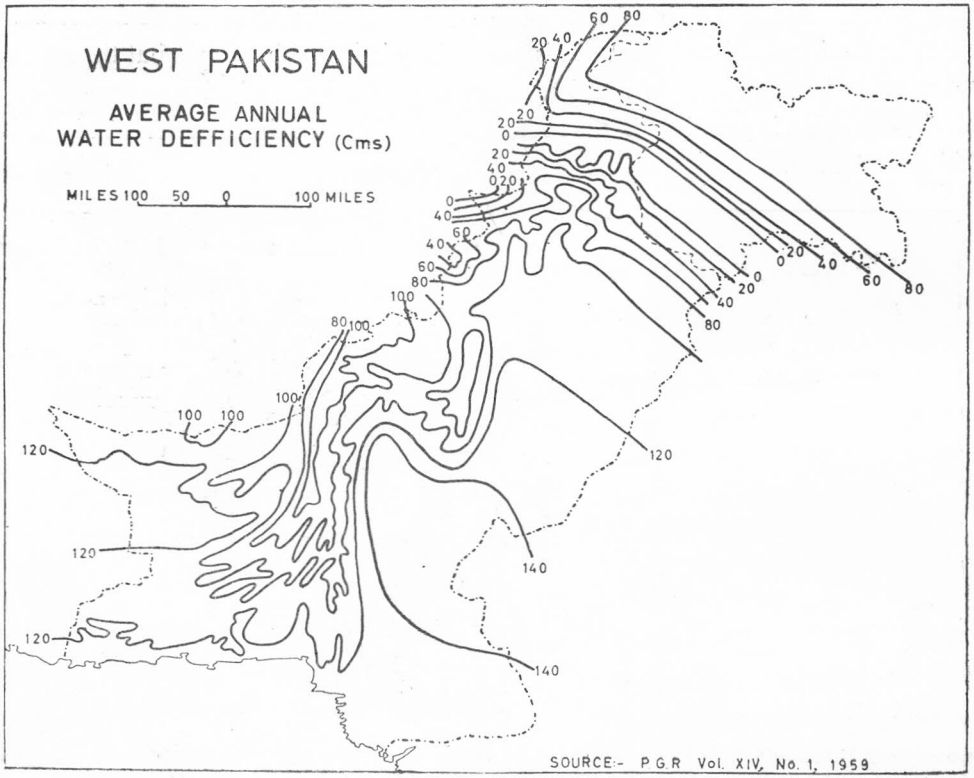

FIGURE 7

Districts of Campbellpur, Rawalpindi and Jhelum cover the entire Potwar Plateau and a greater part of the Salt Range. The Potwar Plateau is a land of rock, ravine and rapid soil erosion. It portrays typical bad-land topography. Haro and Soan, the two main drainage channels which lie deeply imbedded in the Potwar, are useless for irrigation purposes. Coarse and moderately coarse alluvium is widespread in the western and central parts whereas silt loam and silt clay is more common in the eastern parts.

Cultivation is limited to patches of level land and ravine beds which are often dotted with wells. Rainfall in most parts is well over twenty inches which makes dry cropping also possible. Usually crops like *jowar* and *bajra* which are more drought resistant are grown in summer. Wheat remains the largest winter crop in areas of relatively higher winter rainfall from western disturbances.

In contrast to the low intensity of cropping in most parts, Chach plain and Pindi plain are the scenes of intensive cultivation. Chach plain is a generaly sloping plain covered with fine-textured alluvial deposits and represents a continuation of Swabi plain across the Indus. Water table is high and well irrigation is economical. It specializes in the cultivation of tobacco.

In the Rawalpindi plain where also relatively more fertile soils and better facilities of water supply from wells exist the cultivated land is more extensive. The pattern of land use is likely to record great changes in the uplands of Rawalpindi due to the impact of the growing capital of Islamabad and availability of irrigation water from Rawal Dam. The vegetable gardening and mixed farming have already begun taking place of the cereal cultivation in the surrounding villages.

The Salt-Range plateaus have some cultivated land which is mostly dry-cropped or torrent-watered.

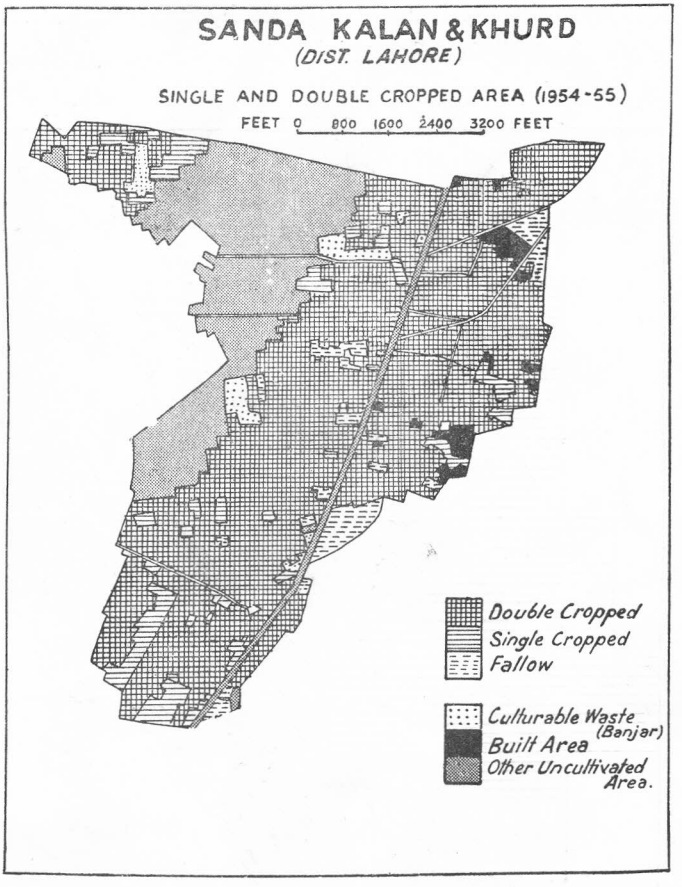

FIGURE 8

The southern part of Jhelum district outside the Potwar Plateau is comprised of the Salt Range Piedmont and the active and meander flood plains of Jhelum. In the piedmont zone the salt outwash and the coarse-textured soils make agriculture precarious. Figure 9 provides a sample of land use in the Salt Range Piedmont near Khewra. The only part where some area is irrigated by canals is near the river but crops are insecure because of frequent floods.

As a result of the rough terrain, precarious dry-cropping and small size of the holdings, returns are far from being satisfactory.

The submontane district of Sialkot, which forms a part of the Rechana Doab, has much lower agricultural efficiency as compared to the contiguous areas of Gujranwala

and Sheikhupura. This is mainly due to a large area under dry-cropping in the piedmont zone, the frequent floods caused by several *nalas* (ditches) and waterlogging in the low-lying and ill-drained areas.

The higher rainfall of more than thirty-five inches makes the dry-cropping securer than in the Potwar, but the whole of the piedmont zone is built of coarse-textured deposits of low fertility and is badly dissected by numerous *nalas*. This area is capable of growing only pulses and some wheat in winter and maize and fodder in summer. No cash crops are grown.

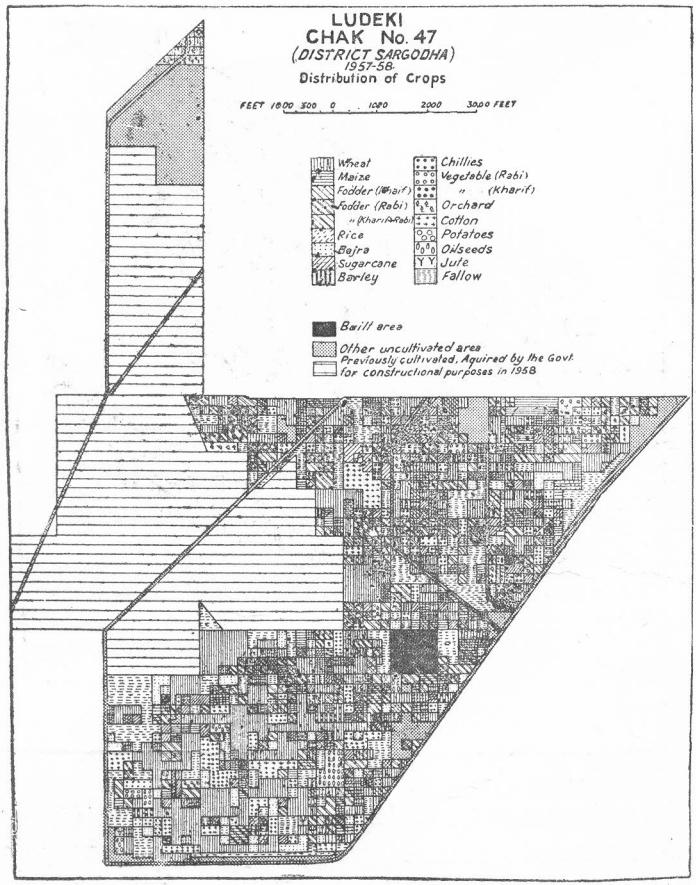

FIGURE 9

In the Sialkot Plain conditions are better. It is a more or less level plain built of Chenab alluvium in the north and deposits of Deg, Basantar and Bein *nala* in the south. Wells are the main source of irrigation water, especially the Charkari *tehsil* is known for intensive well irrigation. Rice, sugarcane, maize and millets are grown in summer and wheat, fodder and vegetables in winter.

b) Submontane areas of Sibi, Dera Ghazi Khan and most of the southern part of Sind Sagar Doab in Muzaffargarh districts present somewhat different land use patterns from that in the northern submontane areas already discussed. The cropping intensities are very low due to the rough terrain and paucity of irrigation water especially in Sibi where only 3.6 per cent of the total area is cultivated. Because of very low rainfall dry cropping ceases to be an important type of land use.

The western part of D. G. Khan and a greater part of Sibi comprises the piedmont area with coarse-textured soils. The cultivated areas, therefore, are limited to the narrow

zone of the cover and meander flood plains on either side of the Indus in D. G. Khan and Muzaffargarh and a small part of the Kacchi Plain in Sibi. Flood canals provide summer irrigation in the flood plains. Torrent irrigation is practised in parts of the piedoment zone. Figure 12 shows a marked change in the land use pattern and intensity from the torrent watered fields of the piedmont zone to the canal irrigated areas of the village Gadai near D. G. Khan.

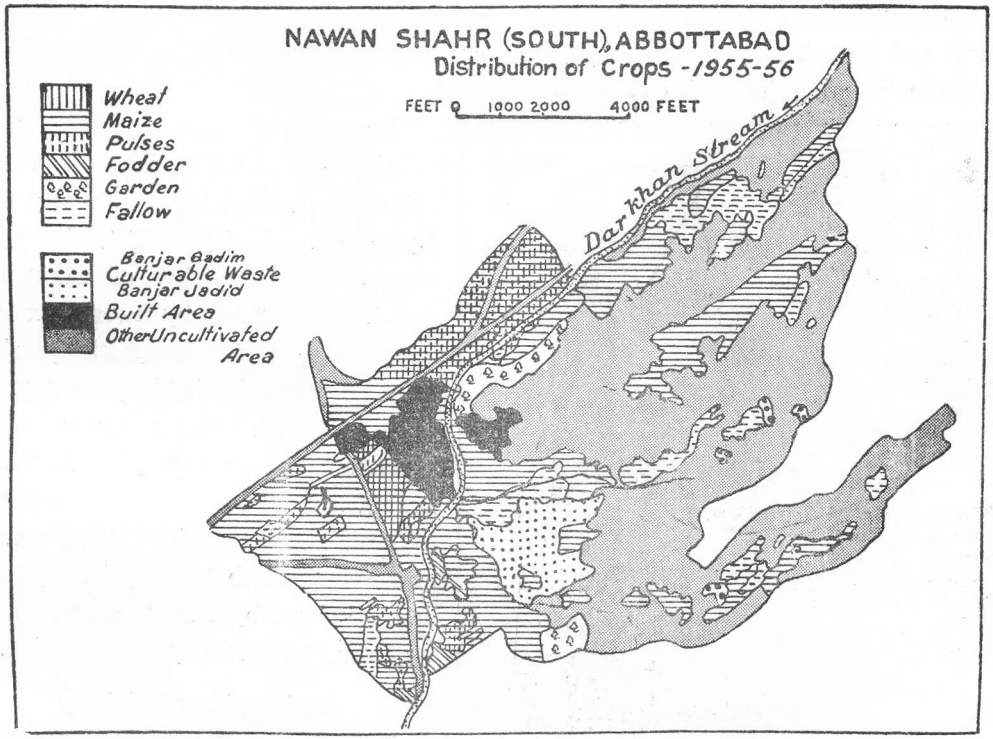

FIGURE 10

Kacchi Plain of Sibi is an almost barren and featureless area. It is traversed by seasonal streams, Nari, Bolan and Suklej from the north and west; and Chakar, Lahri and Chhatr from the north-east. The low rainfall of three to five inches along with high thermal efficiency makes dry-cropping impossible. The only cultivated patches are found in the torrent watered or *sailaba* lands[15] which grow some *jowar* and *bajra*.

On the whole, the agriculture is very insecure for want of perennial water supply and frequent floods which sometimes wash away the entire crop in the affected areas.

c) In the Lower Sind Plain in Hyderabad, Sanghar, Tharparker and Dadu districts the conspicuous features of land use resulting in low efficiency are the large extent of

[15] Land with sufficient subsoil moisture for the crops to grow without irrigation.

land (40 per cent or more), relatively low intensity of cropping, complete absence of dry-cropped area, and an exceptionally large proportion of land cultivated by tenants (Tables 4 and 5).

Most of the area is covered with moderately coarse to fine-textured alluvial deposits of the extensive cover flood plains. Only in the western part of Dadu, in the Kirthar Piedmont, the soils are coarse-textured. All the cutivated area is canal irrigated. Cotton, rice and millets are the main summer crops, but some sugarcane is also grown. In winter, wheat and oilseeds are generally grown on land which receives irrigation water from the flood canals during the sowing period in autumn.

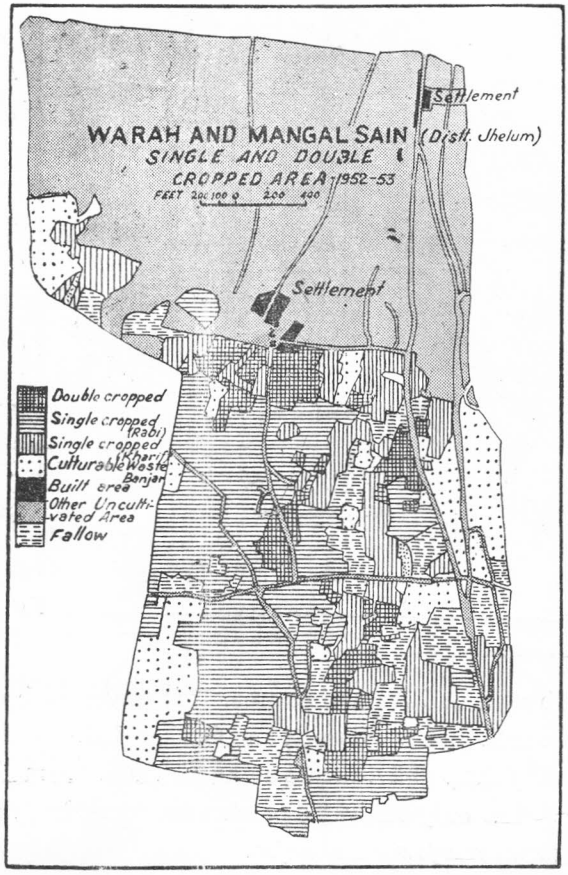

FIGURE 11

Large areas are suffering from salinity and waterlogging which have affected the yields adversely. In Hyderabad district, which is more severely affected, yields of wheat and rice have declined by twenty-six and forty-one per cent respectively since 1936-37. Situation is likely to improve in future with larger quantities of perennial water supply from Kotri Barrage.

Holdings are fairly large, usually above ten acres, but exceptionally large area cultivated by tenants comes in the way of better efficiency of agriculture.

Region of Low Efficiency

This region covers the largest area of West Pakistan, but has a very small proportion of the cultivated area (Table 8). Only 7.4 per cent of the total area is cultivated. The only districts with a larger extent of cultivated land are Mianwali and Dera Ismail Khan where forty-seven per cent and twenty-six per cent of the total area is cultivated respectively. Cropping patterns in these latter districts differ from those in the mountainous districts of Quetta, Zhob, Kalat, Lasbela and the deltaic area of Thatta.

a) The submontane area in D. I. Khan and the northern part of Mianwali have extensive cultivation with a large part of cultivated land left fallow but only 6.7

per cent of the area is double-cropped. About two-thirds of the sown area is dry-cropped.

In D. I. Khan landforms are developed more or less on a similar pattern as in D. G. Khan with a much wider piedmont zone and much finer soils of the meander flood plains of the Indus. It is seasonally irrigated by the inundation canals. The rolling sandy plains of northern Thal in Mianwali, however, have both perennial and seasonal irrigation. Sugarcane, cotton and rice are grown in summer on perennially irrigated lands. Wheat and millets are the usual winter crops. Salinity and waterlogging have appeared in the northern part of Thal in a few localities.

TABLES 8—LAND USE (1958-59—62-63)

Region	Total Geog. Area (000 acres)	Total cultivated Area (%of total area)	Culturable waste (% of total area)	Not available for cultivation (%of total area)
1	2	3	4	5
1. Highest Efficiency	12,988	71.1	15.6	13.3
2. High Efficiency	32,669	42.4	11.3	46.3
3. Moderate Efficiency	46,971	3.01	16.9	53.0
4. Low Efficiency	49,378	7.4	16.2	76.3
5. Lowest Efficiency	39,125	0.6	9.1	90.3
	181,131	22.7	13.9	63.4

These two districts are similar in landscape and general conditions to the two southern districts of D. G. Khan and Muzaffargarh but have a much lower agricultural efficiency partly on account of relatively higher proportion of dry-cropped area and restricted water supply in the perennially irrigated portions and partly due to waterlogging and salinity.

b) In the predominantly upland areas of Quetta, Zhob, Loralai, Kalat and Lasbela small patches of cultivated land are restricted to narrow valley plains. Vast areas of dry and rough mountains are of little agricultural value. Wheat and millets are the only crops grown on irrigated or torrent-watered land. This receives most of its rainfall in winter months which is of great help for these crops. In some of these irrigated valleys and plains, however, great intensity of cropping is recorded. Figure 11 shows that in the village of Ahmad Khan Zai, availability of irrigation water and the impact of the large urban centre of Quetta at a distance of about four miles, have resulted in a large area under vegetables and fruits and a high proportion of double-cropped land.

(*c*) Thatta district consists of the deltaic flood plains and the tidal flood plains. It is traversed by numerous braided channels of the Indus. The cultivated area is only limited to the north in the Thatta Plain, a greater part of which is irrigated by perennial canals. Rice is the main crop in summer while pulses, oilseeds and some wheat are grown in winter.

Region of Lowest Efficiency

This region comprises the western most districts of West Pakistan in the Baluchistan Plateau—Chagai, Kharan and Mekran. Most of it consists of hills and deserts with inland drainage, like Hamuni-Lora and Siah-Reg in Chagai near the Afghanistan border, Khargoshkan and Kharan deserts near the Iranian border which merge in the deserts of Hamun-i-Mashkel and Dasht-i-Tahlab. Very meagre rainfall, lack of surface drainage and generally saline ground-water have resulted in the small extent of cultivated area (less than 1 per cent of the total) which lies in small valleys and foothills. Wheat and millets are the only crops grown.

TABLE 9—ACREAGE AND PRODUCTION OF SOME CROPS (EXPRESSED AS PERCENTAGE OF WEST PAKISTAN TOTAL) 1958-59—1962-63

Region ..	Wheat		Gram		Barley		Rice		Maize	
	A.	P.	A.	P.	A.	P.	A.	P.	A.	P.
1	2	3	4	5	6	7	8	9	10	11
1. Highest Efficiency	29.1	32.2	15.6	21.7	27.0	48.5	10.1	9.3	41.4	38.8
2. High Efficiency	27.7	28.2	46.5	48.9	27.9	21.6	58.6	61.9	28.6	26.0
3. Moderate Efficiency	33.5	36.9	15.8	11.7	36.8	25.6	39.5	26.3	27.9	34.3
4. Low Efficiency	7.1	2.4	21.8	17.6	8.1	4.2	1.7	2.3	2.0	0.7
5. Lowest Efficiency	0.5	0.2	..	..	..	..	..	..	..	..

Region — ..	Jowar		Bajra		Cotton		Sugarcane	
	A.	P.	A.	P.	A.	P.	A.	P.
	12	13	14	15	16	17	18	19
1. Highest Efficiency	11.0	8.1	6.0	12.9	42.5	43.9	44.8	40.4
2. High Efficiency	46.7	51.2	27.0	33.6	29.9	31.4	40.7	46.6
3. Moderate Efficiency	39.9	34.9	62.2	48.7	27.0	24.4	11.7	10.9
4. Low Efficiency	11.4	5.7	4.6	4.6	0.3	0.2	2.6	1.9
5. Lowest Efficiency	0.2	0.4	..	..	..	..	..	..

A = Area P = Production

Source: Data supplied by the Department of Agriculture, Lahore; Government of West Pakistan.

TABLE 10—CROPPING PATTERNS IN ORDER OF IMPORTANCE ACCORDING TO AREA OCCUPIED IN EACH REGION. PRINCIPAL CROPS ONLY

Region	Crops
1. Highest Efficiency	Wheat Cotton Sugarcane Gram Maize Rice Bajra Barley Jowar.
2. High Efficiency	Wheat Rice Gram Cotton Jowar Bajra Sugarcane Barley Maize.
3. Moderate Efficiency	Wheat Bajra Cotton Rice Jowar Gram Barley Sugarcane Gram.
4. Low Efficiency	Wheat Gram Jowar Bajra Rice Barley Sugarcane Maize Cotton.
5. Lowest Efficiency	Wheat Jowar.
West Pakistan	Wheat Gram Rice Cotton Bajra Jowar Sugarcane Maize Barley.

COMPARISON WITH SOME OTHER COUNTRIES

A comparison with some other countries of the world places West Pakistan among countries of very low agricultural efficiency. Average yields in West Pakistan for almost all crops remain below the world average (Table 11). Wheat yield is half of that in U.S.A., three-quarters of that in Australia, one-thirds of that in Japan and U.A.R., rice yield is about one-thirds of that in U.S.A., less than one-quarter of that in Australia and one-thirds of that in Turkey. In case of cotton and sugarcane also, the picture is no less gloomy. Figure 14 shows that the average yields of six crops (wheat, barley, rice, maize, cotton and sugarcane) are fifty five per cent of the average world yields.

TABLE 11—YIELD OF SOME CROPS MAUNDS/ACRE (AVERAGE 1959-60—1961-62)

Sr. No.	Countries	Wheat		Barley		Rice	
		Yield	Percentage deviation from the average world yield	Yield	Percentage deviation from the average world yield	Yield	Percentage deviation from the average world yield
	1	2	3	4	5	6	7
1.	France	27.2	212	27.2	186	40.4	83
2.	Canada	12.1	94	18.1	123	..	..
3.	U. S. A.	17.2	133	17.2	118	40.9	85
4.	Australia	12.8	99	30.3	208	68.4	141
5.	Brazil	6.1	47	8.8	60	18.1	38
6.	Turkey	10.9	85	12.9	88	41.7	86
7.	Iraq	5.2	40	8.2	56	15.4	32
8.	U. A. R.	25.8	200	2.68	174	53.9	109
9	Indonesia	..	..	..	..	19.2	39.7
10	Japan	27.3	212	28.3	194	51.1	105
11.	India	8.6	68	9.0	62	15.8	33
12.	Pakistan	8.6	68	7·1	48	16.9	35
13.	West Pakistan	8.7	68	7.0	47	14.4	30
	World	12.9	100	14.6	100	48.4	100

TABLE 11—*Continued*

	Maize		Cotton		Sugarcane		
	Yield	Percentage deviation from the average world yield	Yield	Percentage deviation from the average world yield	Yield	Percentage deviation from the average world yield	Average deviation for all crops
		9	10	11	1%	13	14
1. France	30.4	138	..	..	..	..	155%
2. Canada	43.0	196	..	..	..	..	..
3. U. S. A.	37.9	172	5.3	151	602	122	130%
4. Australia	27.1	123	1.6	46	727	145	128%
5. Brazil	13.9	63	1.9	55	455	92	59%
6. Turkey	15.8	74	3.2	88	..	..	84%
7. Iraq	6.4	29	2.4	69	..	..	45%
8. U. A. R.	23.4	106	6.3	180	1049	211	163%
9. Indonesia	9.8	44.5	2.4	68	812	164	79%
0. Japan	26.7	122	..	..	400	81	158%
11. India	9.8	44.5	1.0	28	434	88	51%
12. Pakistan	10.5	48	2.4	68	332	67	56%
13. West Pakistan ..	10.4	49	2.4	68	..	..	55%
World	22.0	100	3.5	100	493	100	

Source : (1) F. A. O., *Production Year Book*, 1962, Vol. 16.

(2) Data supplied by the Department of Agriculture, Lahore: Government of West Pakistan

A study of Tables 1 and 10 shows that for most of the crops yields obtained, even from the best agricultural lands in West Pakistan, do not compare favourably with other countries. Only Lyallpur, Multan and Montgomery near the world average in wheat yield alone.

A much more important aspect of the problem concerns with what we are doing to our present agricultural land in the way of increasing its productivity. In the decennium 1951-61 a study of trends in yields shows that Pakistan does not touch the world mark in the percentage increase of yields. Wheat and maize yields show a downward trend (Table 12). The only crops that seem to have made some progress are cotton and sugarcane. In the

case of cotton and sugarcane yields have increased by thirteen per cent and thirty per cent respectively. U.S.A., France and U.A.R. show the greatest increase in yields during the same period. Even Turkey, Brazil and Argentina show better results than West Pakistan (Table 12).

TABLE 12—PERCENTAGE DEVIATION OF CROP YIELDS/ACRE—1961, (1951-100)

Country	Crop					
	Wheat	Barley	Rice	Maize	Cotton	Sugarcane
1	2	3	4	5	6	7
France	133	150	125	..	..	..
W. Germany	124	100	111	..	..	..
Italy	111	114	150	126	..	..
U. S. A.	145	109	146	169	166	148
Argentina	109	110	102	135	..	139
Brazil	92	90	113	100	143	NA
Japan	135	132	127	180	..	..
India	121	122	136	150	100	NA
Turkey	100	93	114	103	125	..
Egypt	131	136	160	120	113	124
Australia	110	90	146	..	..	136
U. S. S. R.	122	90	114	172	200	..
West Pakistan	96	100	101	90	113	130
Pakistan	91	100	130	105	114	173
World	109	108	125	125	148	NA

Table 13 shows that in West pakistan the quantity of chemical fertilizers used is one of the lowest—0.02 maunds per acre. In most of the agriculturally advanced countries much larger quantities of chemical fertilizers are used. Experiments have shown that the arable land in West Pakistan has given a very encouraging response

TABLE 13—QUANTITY OF THE CHEMICAL FERTILIZER AND TRACTORS

Country	Quantity of Chemical Fertilizers used mds/ acre	Number of Tractors per 1000 acres of cultivated land
France	1.14	83
Italy	0.61	44
U. S. A.	0.43	60
Argentina	0.21	9
Brazil	0.14	8
Indonesia	0.01	0.15
Japan	3.1	4
Turkey	0.01	4
U. A. R.	0.9	1.8
Pakistan	0.02	0.15
India	0.02	0.07

Source : F. A. O. *Production Year Book* 1962, Vol. 16.

to the application of chemical fertilizers on experimental farms. The soils of West Pakistan are generally deficit in phosphorus and nitrogen. Application of thirty pounds of nitrogenous fertilizers (in the form of ammonium sulphate) has raised the yield of wheat by twenty-five per cent[16] which amounts to two to three maunds per acre. In hilly and dry cropped areas the application of nitrogen and phosphorus has raised the yield by fifty per cent. The total requirements of fertilizers for all the existing cropped acreage is calculated to be four million tons, which amounts to about three maunds per acre almost equal to the amount used in Japan. It shall require great effort to provide even half of this amount from the fertilizer factories at home. Moreover unless and until chemical fertilizers are supplied at a subsidized rate (which at present keeps changing) the farmers are reluctant to use these for economic reasons apart from their ignorance.

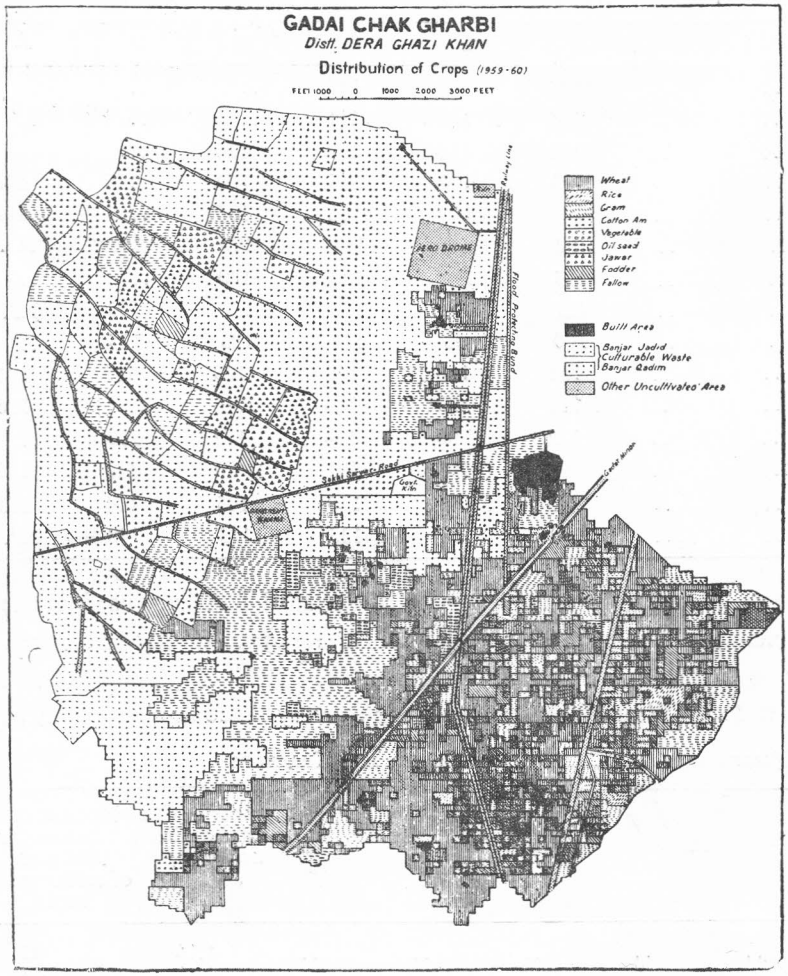

FIGURE 12

Unlike the large Farms in some countries like Canada, U. S. A. or Argentina average size of the cultivated holdings in West Pakistan is only 7.6 acres, and varies from under one acre to over 150 acres. Less than one thirds of the cultivated land is in farms of 12.5[17]

[16]Pakistan Food and Agriculture Commission, *Report of the Food and Agriculture Commission* (Karachi: Ministry of food and Agriculture, 1960) pp. 74-75.

[17]According to Land Reforms Report a holding of 12.5 acres of irrigated and 25 acres of unirrigated land has been considered to be economic.

to 25 acres. Larger farms of over 150 acres only hold five per cent of the cultivated area. These small-sized farms in general are not inducive to the mechanization of agriculture on individual basis. At present there are only 1,768 tractors and 8 combined harvesters and thrashers in the country (Table 12). The mechanization of agriculture can be planned and practised on co-operative basis along with an all round economic development in our country so that the extra farm population be consumed in other productive occupations. Apart from this aspect, old farming implements need to be replaced by better ones. This, done on individual basis, would also go a long way in increasing the efficiency of agriculture. The experimental farms have shown the healthy results of co-operative farming with better agricultural implements.

Inadequate irrigation water especially in winter is also a factor in lower agricultural efficiency. At present farm deliveries of surface water in the Northern Zone (Punjab and Bahawalpur Plains) are estimated to be on the average 1.8 acre feet per acre (2.2 acre feet per acre during summer and 1.6 acre feet per acre during winter). In the Southern Zone (Sind Plains) an average of 3.3 acre feet of water per acre is supplied. These supplies are generally too small to ensure the optimum intensity of cropping in the culturable commanded area and avoid

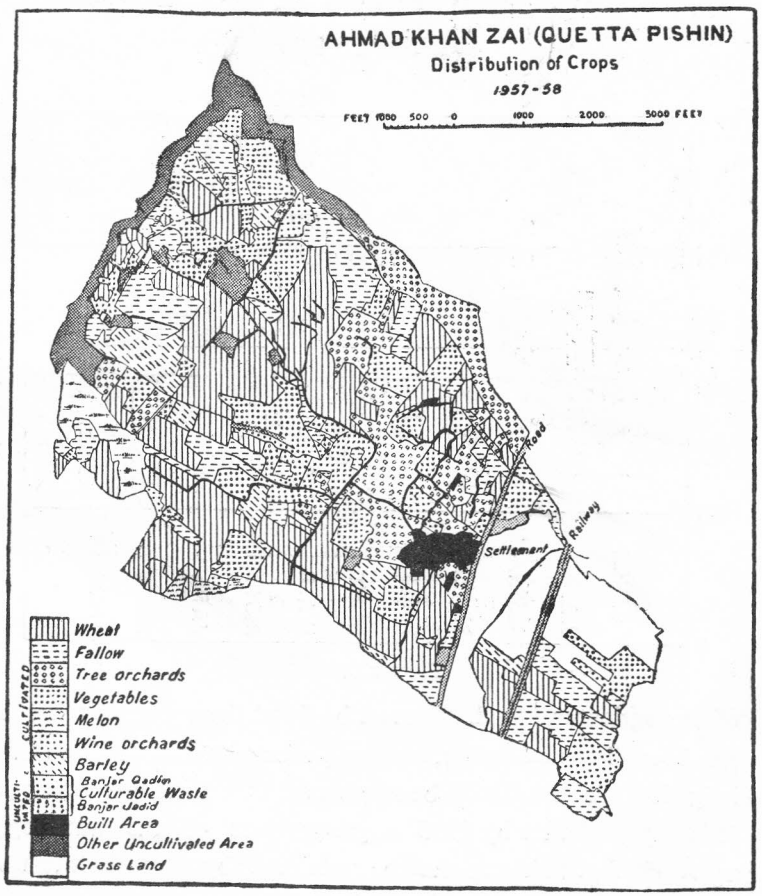

FIGURE 13

salinization of the soil. Keeping in view the water deficiencies in these zones, 2.7 and 2.4 acre feet of water should be supplied in summer and winter respectively in the

Northern Zone.[18] The Southern Zone which includes areas of greatest water deficiencies (Fig. 7) should receive between four and five acre feet of water per acre. This shall not only increase the efficiency of land use but also help in flushing the salts to lower soil horizon.

Conclusion

It is clear from the previous discussion that the low efficiency of agriculture in West Pakistan is not an incurable disease, and that the present-day land use even in our best lands is not the optimum. It is needless to say that with human efforts even the bad lands can become very productive and with negligence the best lands can deteriorate.

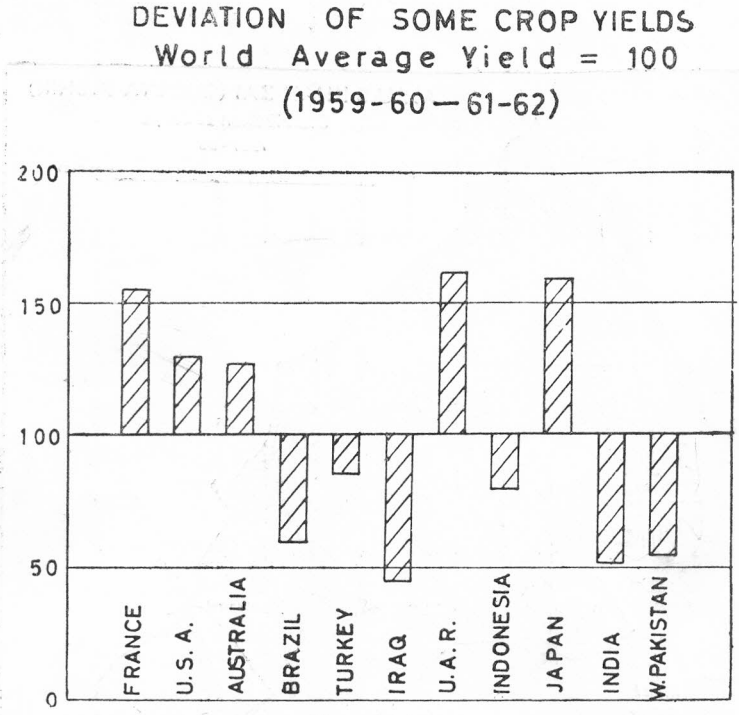

Figure 14

In most of the countries, in general, stress is laid on greater intensity of cropping rather than on the expansion of the arable land. As has been stated earlier, West Pakistan has expanded its arable land by ten per cent between 1953-54—62-63 which in view of the declining yields of important cereals seems to be no remedy for the growing food demand of our population. However, the efficiency of agriculture in West Pakistan can greatly be improved if attention is paid to some of the urgent needs of our agricutural land. It must be freed from waterlogging and salinity. At present as has been discussed earlier, some of the best land suffers from this blight. Moreover, the new irrigation schemes should be so planned that further waterlogging and salinity be checked. It is expected that by 1975 a greater part of the waterlogged and salinity infected areas of West Pakistan shall be reclaimed by several schemes launched by the Water and Power Development Authority.

[18]Hazara Engineering Company, *Programme of Water and Power Development in West Pakistan Through* 1963---75 (Lahore: WAWDA).

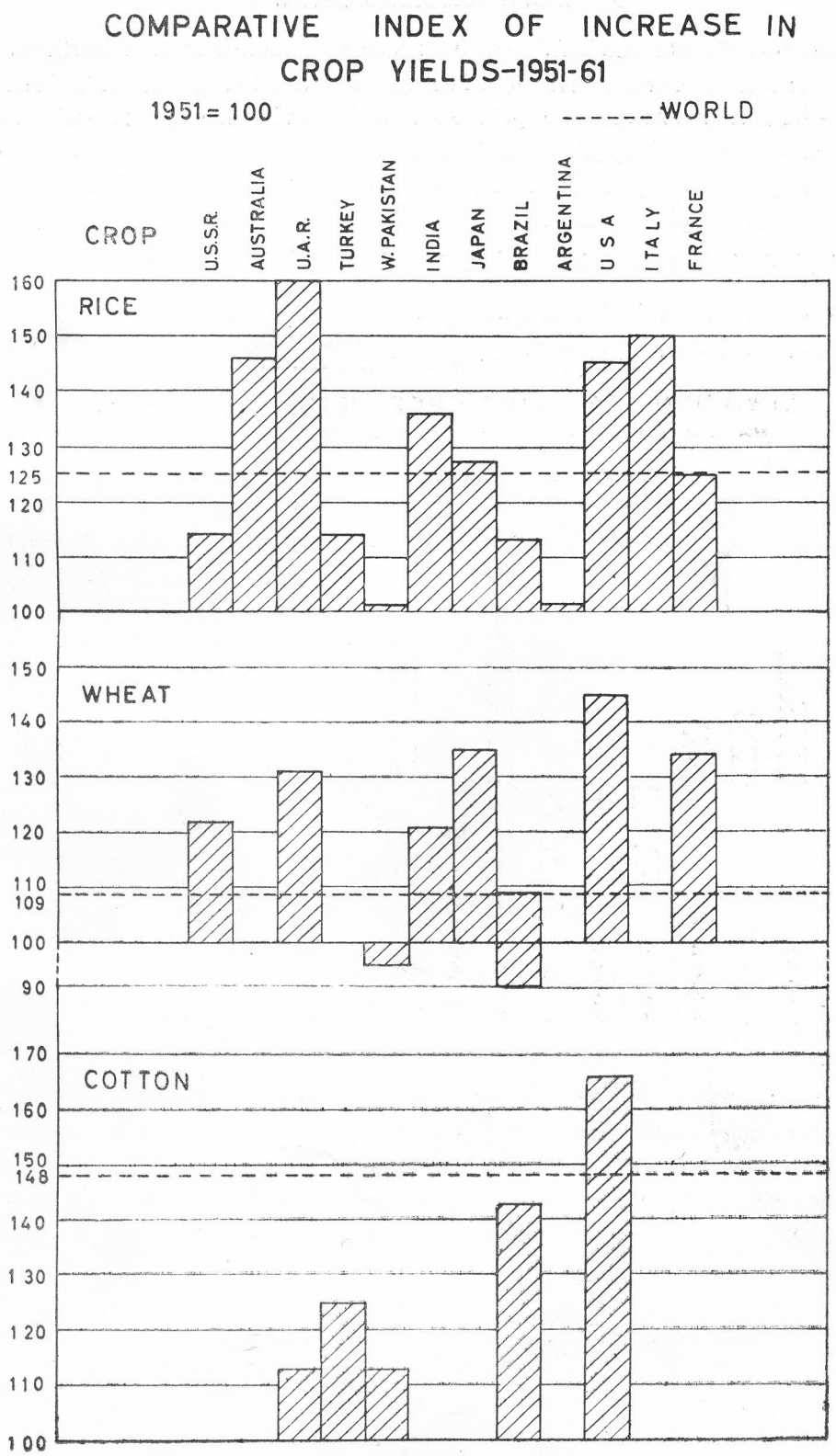
COMPARATIVE INDEX OF INCREASE IN CROP YIELDS-1951-61
1951 = 100
------ WORLD
CROP
U.S.S.R.
AUSTRALIA
U.A.R.
TURKEY
W. PAKISTAN
INDIA
JAPAN
BRAZIL
ARGENTINA
U S A
ITALY
FRANCE
RICE
160
150
140
130
125
120
110
100
WHEAT
150
140
130
120
110
109
100
90
COTTON
170
160
150
148
140
130
120
110
100

FIGURE 15

Examples of Japan and U.A.R. can be encouraging where in spite of dearth of arable land, great intensity of cropping has eased the food situation to a great extent. It shall be more befitting that more attention be paid to our existing land than bringing more land under cultivation for our existing agricultural land is the first class land whereas the culturable waste in many parts is only marginal. This would certainly need reorientation of our irrigation system and cropping patterns.

Agriculture in West Pakistan needs 'AID'

{ Agricultural Extension,
Intensity of Land Use and Irrigation,
Drainage of the Waterlogged Areas.

REGIONAL CO-OPERATION FOR DEVELOPMENT: A SOCIO-POLITICAL ANALYSIS

KANIZ F. YOUSUF

INTRODUCTION

OF the many consequences of the Second World War one is the tumbling down of the three hundred years old world order of Western political and economic domination. A large number of Afro-Asian countries have obtained their freedom from Western colonialism, but their heritage from the colonial past is a stagnant society, in which no natural socio-cultural or ideological development has taken place. This is making it difficult for the newly independent countries to define a political and economic philosophy for themselves. A revival of the pre-colonial systems means going back in time and adoption to Western systems is producing problems of maladjustments. Hence a varying degree of confusion presists in the political economic and social spheres of national life.

World Economic Trends

However, it is the economic development which has become the most critical issue. The crux of the problem is that during the colonial period the economic systems of these countries were geared to provide raw materials to the Western Industrial Nations and serve as a market for their manufactured products. After independence the so-called under developed countries had to face the difficult problem of renovating an economic system which was characterized by low productivity, large scale unemployment, low standards of living and a critical shortage of food. The circumstances demanded the quickest answer to the problem of economic development. Asian, faced with a choice of an economic philosophy, considered the two major ideologies, Capitalism and Communism, with human labour as their only surplus resource, and with capital at the lowest level, these countries were inclined to consider and adopt the socialistic approach of utilizing population reserves. Since the basic appeal of communism is its claim to solve the duel problem of unemployment and low productivity simultaneously it soon becomes evident that if capital was not supplied to the under developed countries, they may be attracted towards communism. Thus, the U. S. A., which became the undisputed leader of democratic capitalist world at the end of the second World War, launched a programme of loans and aid for the developing States. Later, some European nations, Canada and the U. S. S. R. also followed the example.

The aid to the newly independent nations came in various forms. The situation re-

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mained unchanged to a very great extent. There are two main reasons for the continued poverty in these lands. The first and foremost reason is the intellectual subjugation of the newly independent nations. During the three hundred years of Western ascendency Afro-Asian nations have not been able to contribute much in the realm of progressive ideas in various walks of life. New ideas are like strategic plans conceived by the intellectuals of the nations to meet the challenge of the time. When such ideas are not growing from within a society nations are prone to accept ideas and beliefs from the world outside them. Thus, the under-developed nations accepted whatever ideas came from the West.

Among many others they also accepted that the prosperity of the Orient is secreted in raising more cows and growing more turnips. This hypothesis was sold in the east to keep the ex-colonies geared to pre-colonial agricultural economies. Thus the economists and planners of the under developed countries remained unaware of a simple principle that agricultural economy is superior to pastoral economy and industrial economy is superior to agricultureal economy. An example from the most highly mechanized country will explain this point. In the United States, according to the Agriculture Department *Report*, the net income of forty-four per cent of the agricultureal families averages dollars 217 a year, whereas the non-farm income averages dollars 2,884 per family.[1]

A large sector of population engaged in industrial and allied to more productive pursuits means that *per capita* income is high and so is the national income. Overall capital accumulation is abundant and when invested and reinvested results in the desired economic growth of the country. The opposite of the above prevails in the under-developed countries, where a large sector of population is engaged in agriculture. It means low *per capita* income, low national income and thus a low rate of economic development. If any country today wants to get rich she must industrialize quickly. Agriculture will soon become an industry in an industrial economy. Giving priority to the improvement of agriculture, thinking that it will bring foreign exchange enough for the industrialization of the country is not only too winding a road to success but simply a milage.

An unnecessary emphasis on the development of agriculture prior to industrialization is deterimental in another way also. There are certain fields which lend themselves to mechanization and planning more easily and economically than others. Agriculture cannot be as economically mechanized as most industries could. There are too many natural contingencies to be met with which still are beyond human control. The truth of the statement is proved by Russia where, since the Revolution, industrial production has increased at an exceptionally high rate, agriculture has been defying the soviet planners. Even in the U. S. A., the Government spends seven million dollars a year to subsidize agriculture.[2] In short, under-developed nations have to comprehend and appreciate this fact.

[1] *Time Magazine* (July 19, 1963) p. 7.

[2] *Ibid.*

The economic development of a country depends upon a host of factors, *i.e.*, the availability of raw materials, power, cheap labour, technical know-how, capital and market. A couple of decades ago great importance was attached to raw material, power and capital. However, the relative importance of these factors has changed over the past years. Raw materials can be imported because they are available at competitive prices in the international market. Sellers outnumber the buyers by a considerable margin. Japan and Switzerland are examples of countries which import the raw materials even for heavy industry. Then coal is not the only source of power for industry ; oil, gas and electric power are becoming more popular, and the use of atomic fuel for power has recently become competitive. It may be pointed out that whereas the distribution of coal was in favour of the West, the distribution of oil is in favour of the so-called underdeveloped countries. Technical know-how is discovering other sources of power as well and the underdeveloped countries must be vigilant to make use of the latest discoveries. Research is expensive and state patronage and even state enterprise is required to mobilize the benefits of modern research in aid of the developing countries. Modern research and some types of industry are so expensive that small countries are unable to undertake them.

Almost all the under-developed countries are densely populated. The problem is unemployment and not of the availability of cheap labour. The economic theories about capital accumulation have changed. It has been agreed that capital accumulation is the function of economic development and not that economic development is a function of capital accumulation. Thus the determining factors for large scale industrialization today are technical know-how and the size of the market. Sometime ago technical know-how was restricted to the Western Nations. Now this too is available to any nation that may have the desire to acquire it. It needs intelligence, persistence and hard work. It needs creative, energetic, daring and tenacious minds to grasp and capture great new ideas in every order of life. In the words of Ortegay Gasset, " a creative life implies a regime of strict mental health, of high conduct, of constant stimulus, which keep active the consciousness of man's dignity ".[3] But in this modern world of hyper democracy, the most difficult thing to achieve is a disciplined life. People have become too conscious of their rights and too oblivious of their duties. Such a state of affairs does not allow an atmosphere of consciousness of authority. Hence creative work is still at a very low level in almost all the developing countries. Even the exponents of Democracy and Capitalism have admitted that certain social and political conditions are prerequisite for making even Capitalism work for the growth of a nation. W. W. Restow—the writer of the non-communist Manifesto says :

> "Until a definite political transformation occurs—which harnesses national energies, talent and resources around the concrete task of economic growth—the fall off is likely to be

[3]J. Ortega y G., *Revolt of the Masses* (London: George Allen and Unvin, 1961) p. 110.

> postponed : negatively, because of the thin layer of modern technical and administrative talent in the society (as well as a society's margin of spending) is likely to be dissipated in activities of low or negative productivity : positively, because the Government is unlikely to play its role effectively in the three sectorial development—in social overhead capital, agriculture, and trade necessary to create the matrix for sustained industrial growth."[4]

However the problem of market has always been the most crucial one, though it was least presented in its real perspective. Till the end of the nineteenth century vast colonial markets were extensive enough to absorb the production of the industrialized European nations. In the twentieth century the competition among the producers became so intense that world had to go through two wars of unprecedented magnitude within a period of thirty years. However, the significance of market is based on the fact that mechanization implies mass production and it has to be equalized by mass consumption to give the "take off" stage to the developing countries. Mass consumption means an extensive market. A large state with a large prosperous population provides the necessary market for the large scale mechanization.

After the second world war when overseas colonial markets shrank in size, European nations were searching for a remedy. They found this single economic factor strong enough to create the European Common Market and European Free Trade Association. Thus, it is clear that in the present day world, economical mechanization and competitive industrialization can be sustained only by a large scale home market. America, Europe, Russia, China and India are large enough to sustain a reasonable rate of economic growth on their home markets. However, the small countries have to follow the European example and form a large tariff-protected regional market to ensure a reasonable pace of industrial development.

The events of the twentieth century have shown that in future, there will be no purely agricultural or purely industerial economics. International trade of pre-war pattern cannot be continued. A trade between nations, one exporting processed and the other unprocessed goods, create an imbalance that cannot be compensated. New developments are suggestive of an international trade mostly in semi-processed goods of equal advantages to the importer and the exporter. In such a pattern the important role will be that of the international price structure, and the ability of a country to produce goods at the lowest cost to compete in the international market.

Current Political Trends

There are yet more powerful forces for internationalism to become the order of the day. Socio-political life of man has been growing since its very inception. Small groups continued to amalagamate and form groups. Human society developed from family to a clan and clans formed tribes and various tribes, though socio-cultureally different, fused to

[4]W. W. Rostow, *The Process of Economic Growth* (Oxford : Clarendon Press, 2nd. edn., 1960) p. 316.

form a nation. Human capacity for fusion is unlimited. Thus, the formation of a national state means a fusion of all socio-cultural or ethnic classes into one political body. It all depends on the people who make the decision to form a state. That is why it has been said that:

> "There is no possible creation of a state unless the minds of certain peoples are capable of abandoning the traditional structure of one form of common life, and in addition, of thinking out another form not previously existing. That is why it is a genuine creation. The State begins by being absolutely a work of imagination. Imagination is the liberating power possessed by man. A people is capable of becoming a State in the degree in which it is able to imagine. Hence it is that with all people there has been a limit to their evolution in the direction of a State, precisely the limit set by nature to their imagination".[5]

It is the nature of things to grow and sustain life, hence it cannot be accepted that the national state is the ultimate end of human socio-political evolution. Nations must grow or they will degenerate and disintegrate. They must enter into bigger enterprises to awaken the hidden capabilities in man and thus grow not horizontally (in area) but vertically (in ideas). Internationalism therefore is a natural socio- political development of the modern times.

It is apparent now that the world is moving towards internationalism. A challenge has been imposed by the economic and political supremacy of the large states. The small nations can only meet in togetherness. Such a situation imposes a question as to which nations may collaborate or cooperate for enterprises based on the factor of mutual benefits and over-all economic growth. Obviously nations with similar background and goals will be inclined to enter into cooperative enterprises. Contiguity and accessibility between cooperating states is of importance from development point of view. Co-operation will therefore be in some kind of regional units. In the East, South East Asia and the Middle East comprise small states while the remaining part of Asia is in two massive units—India and China. The aim here is to analyse the situation in the Middle East for a Regional Co-operation for Development (RCD).

Historical Background of RCD

The region lying between India and the Mediterranean Sea is usually referred to as the Middle East. Socio-culturally speaking it is a region lying between the Orient and the West. The most important feature of the history of this area is that for short periods European powers swept across this area but most of the time Asians ruled this area. The change in political pattern was often accompanied by wars and large scale migrations. As a result homogeneous ethnic group are exceedingly small. The iniroduction of ethnic nationalism in the area has created the problem of internal strife between groups. The force which can unite the diverse groups into a nation is Islam. And Islam does not merely bind the people of a state but it brings the people of the entire region into the fold of the greatest fraternity of all history.

[5]Ortega, *op. cit.*, footnote 3, pp. 118-119

A brief study of the salient historical event of this region needs appraisal. Aryan migrations started from 2500 B. C. and continued till 1000 B.C. Various Aryan tribes settled in the region from North West India to Eastern Europe. They had their own language and religion as well as political organization. These tribes settled in the foot-hills of mountain valleys of the various rivers as dictated by the geography of the area. Extending from the shores of the Mediterranean to the Sutlej river, was the first big Empire established by the Persians (Fig. 1). Alexander the Great conquered the Persian Empire from Macedonia

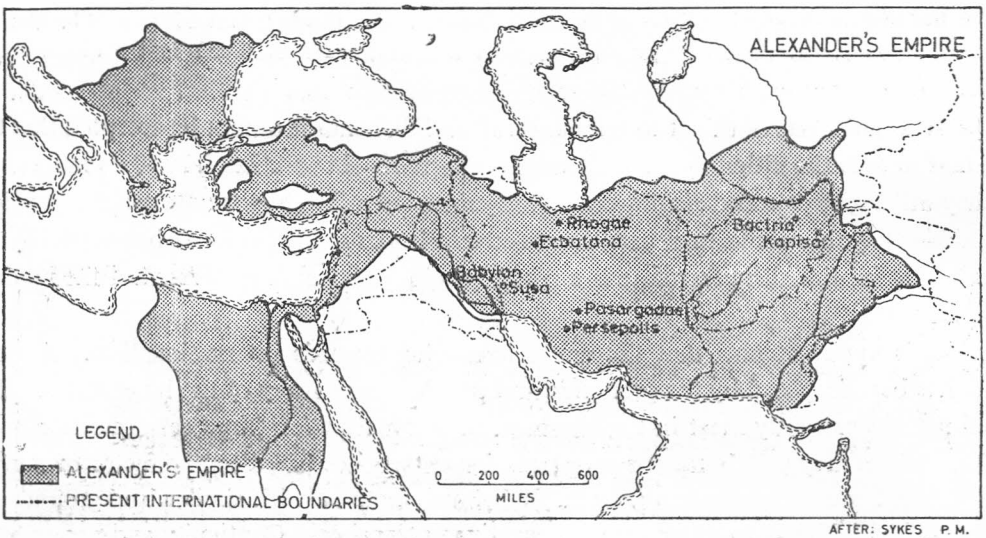

FIGURE 1

to Bias River (Fig. 2). From the first century onward two powers established themselves in the Middle East, one Western (the Romans) and the other Eastern, (the Parthians). The Levant and the modern state of Turkey were a part of the Roman Empire and the remaining part of the Middle East with the exception of the Arabian Peninsula, was Parthia. The too were equally strong empires ; active hostilities between them lasted 400 years. The Romans and the Parthians were replaced by Byzantine and the Sassanian Empires. The Arabian peninsula was a multi-states unit at that time.

Islam infused a new spirit in this region. Muslim Arab expansion at the end of the eighth century extended from the Jhelum to South Eastern Turkey and from Syr Darya to the Arabian Sea. It also included Egypt and Barqa (present Libya). This pattern of the Islamic State continued during the Umayyad and the Abbasid periods. The disintegration of the Abbasid Muslim state was following by the migrations of Turk tribes from Central Asia (Turan). They accepted the faith of the land they conquered and once again the Middle East was consolidated as a state under the Seljuks. After Abbasids Istanbul came up as the centre of the Muslim World. Byzantine Empire had by that time, been conquered by the Turks.

Ottomon Turks took over from Seljuks; a three unit pattern stabilized after a period of multi-state transitional period in the Middle East. These States were the Ottoman Empire, the Safavi Empire and the Mughal Empire. During the sixteenth and the seventeenth centuries Muslim nations were politically the most powerful. In the century the downfall of the Muslim States came about. Mughals fell first of all and India became a British colony. Russia started moving south and the British North West from India. During this struggle of the two for supermacy, the Middle Eastern people suffered the most. Along her southern border Russia annexed Turkish and Persian territories. The British diplomacy helped the birth of Afghanistan as a buffer state between the British India and the Soviet Union. Ottoman Empire disintegrated, so much so that Turkey came to be known as the sickman of Europe. Iranian political and Economic life was controlled by the Russians and the British. In general Muslims were at their lowest when the First World broke out.

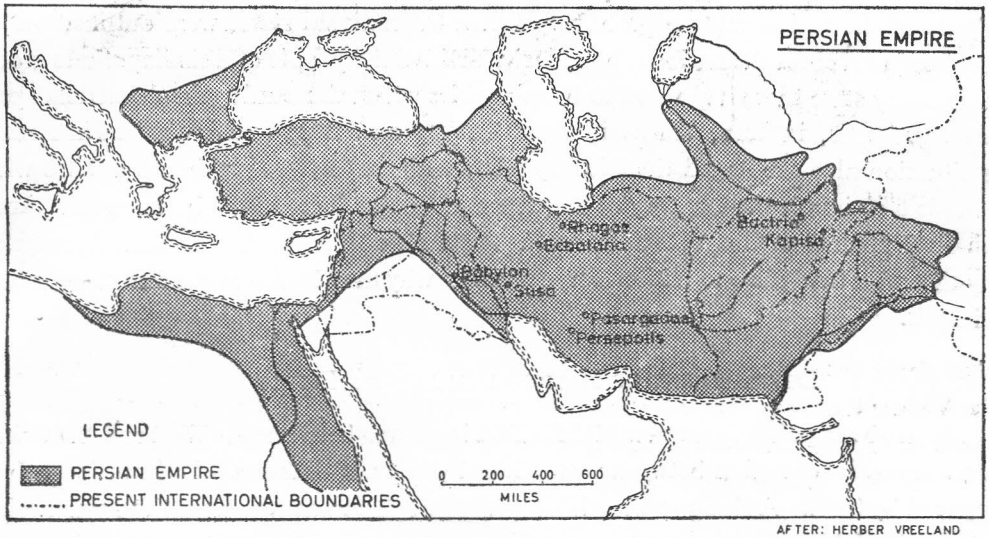

FIGURE 2

This historical account though very sketchy does bring out two outstanding characteristics of the Mddle East. It consists of three civilization Units. The Turks, the Persians and the Arabs. It was Islamic period when all the three united into one. Islamic State existed sometime as a mono-centric state and at others as a poly-centric state. Whenever, there were three units there has been a tough tussel between the continguous states particularly between the western two. In pre-Islamic days the Romans and the Parthians, and the Bzantine and the Sassanian remained at war with each other. Then again Safavi Persia and Ottoman Asia Minor had their dispute over the territory comprising the present province of Azerbijan and Iraq. Surprisingly enough Turko-Iranian border is even today the most guarded boundary in the whole of the Middle East. The

West blames Turks that the Saljuks and the Ottomans looked for conquest towards the heathen West and did not conquer Iran because it was a Muslim State and Iran feels that Turks would never be their friends because their hostilities date far back in the Middle Eastern history.

The second characteristic feature is its ethnic structure. During all this period of history from 2500 B. C. to the end of the seventeenth century, there were no restrictions on the movement of people from East to West and *vice versa.* However, a very generalized system was that from central Asia various Aryan, Turk and Mongol tribes moved westward. During the period of Greek and Arab Superiority, these groups settled wherever the conditions were suitable. Separated by various ranges and under-developed means of transportation these groups have lived in partial isolation and hence have been able to preserve their socio-cultural characteristics. As long as Islam remained the uniting force and the people unaware of ethnic or cultural group systems, the complexity of the ethnic structure of the region was no problem. When the national states were outlined on the basis of cultural cores the national boundaries divided the people of a similar ethnic group. Thus in every state there happened to be minorities which time and again claimed independence *e.g.* Azeris, in Iran, Kurds in Iran, Turkey and Iraq, and Armenians in Turkey. This situation also sabotaged the friendly relations between two neighbouring states when one made a claim on the territory of another national state on ethnic basis *e.g.* the Arabs claim on Persian Gulf Coast Region and the Afghan's claim of Pakhtunistan. It surprises many that after living as one nation for centuries why the Muslim States find co-operation so difficult.

Development of Nationalism and its Effect

It has been pointed out that Middle East is an area between the West and the Orient. Being a transitional region between two cultural worlds of different elements it has been influenced by both. As long as the philosophy of the East was prevalent this hypothesis of ethnic territorial relationship remained unknown to the people of this region. When the West started progressing and the East became subjugated, Western ideas travelled East. Many of them were accepted and many resisted. During this period, nationalism entered into the political philosophy of the Middle Eastern people. It is rather popular with nationalism to find a racial or cultural base to define a people as a nation. In this effort every state had to dig a period in its past, which was naturally pre-Islamic, to define an ethnic core for its people. Thus they had to revive a forgotten past and forget the immediate past. Turks found this in Hittitian period, Iranian in Sassanian period, Arabs in pre-Islamic Arabism and Egyptians in the times of the Pharaos. Consequently the people once known as the Muslims, became divided into tribal groups under the spell of nationalism. F. S. C. Northrop in his book *The Taming of the Nations*, has discussed why in the Middle East nationalism became culturalism and that its effect was not the evolution of

the society towards the formation of larger groups but the disintegration of a vast people into smaller groups. Very few could understand that Middle East had evolved and progressed in its political organization far ahead of its contemporary civilization as well as cultural state. Nationalism basically is an effort in a direction opposite to that of the principle which creates nations. Thus the force of nationalism helped less evolved states to organize and the more evolved states to distintegrate.

Still more interesting part of the political developments of the twentieth century is that even the intellectual of the Middle Eastern countries advocated the establishment of ethnic-national states. In the modern world, the only example of a civilization state is Pakistan, born on the principles of Islamic Nationalism and Pakistanis are the only people professing Islam as their political philosophy.

It is very interesting to study how the thinkers in Turkey and Pakistan, analysing the same characteristics of people reached different conclusions. Zia Gokalp, for instance, defined culture and civilization as two distinct but essential aspects of social life. Civilizations to him refers to modes of action composed of the 'tradition' which are created by different ethnic groups and transmitted from one to another. Culture, on the other hand, is composed of the 'mores' of a particular nation and, consequently, is unique and *Sui Generis*. "Culture constitutes a system whose elements have an integral connection with one another on the basis of a peculiar logic which constitutes ' ethos', civilization, on the other hand, is a product of detachment from that logic". Without culture civilization, according to Zia Gokalp, becomes a matter of mechanical imitation. "It neither penetrates into the inner life of a people nor gives fruit of any kind ". He also emphasized that many cultural groups may belong to one and the same civilization and that they may accept a common religion. Religion, therefore, cannot be the basis of a civilization, nor civilization the basis of a state. It is only the cultural group which is natural and hence basis to state formation. From this theory evolved Turkism—Turkey with a core of Turkish people, with Turki language and Turk 'mores' of life. This was not sufficient. The impact of the Western Civilization made the Turks feel that everything Eastern was averse to progress and development. He, therefore, added that, " When a society does not take a certain civilization in its entirety as a system, it fails to take its parts also. Even it takes some parts, it fails to digest and assimilate them ". Consequently, Western civilization was to be assimilated in its entirety if Turkey was to progress. " We have to accept the civilization of the West, because if we do not, we shall be enslaved by the powers of the West ". In his final analysis, he sythesized the whole discussion in defining the social polity for Turkey as the Turkish Nation, of Islamic Religion and of European Civilization.[6] With all the emphasis on the cultural group as a core of a national state, his hypothesis took Turkey from Islamic Civilization to the Western Civilization.

[6]Z. Gokalp, *Turkish Nationalism and Western Civilization* (London : George Allen and Unwin, 1959) p. 270.

Allama Iqbal, on the other hand believed that, since a society cannot adopt a system in its entirety, it should not seek to do so. In the words of Allama, "The flame of life cannot be borrowed from others, it must be kindled in the temple of one's own soul".[7]

The difference in conclusions of these two thinkers is due to the difference in historical circumstances in which they were born and lived. The Ottoman Empire was disintegrating. East European countries were claiming independence. The bases were ethnic, *i.e.* Slavs, Bulgarians and Hugarians, etc. The Asiatic part of the Ottoman Empire was divided into British, French, Greek and Italian zones of influence. Under the dures of time, Turkey could only fall back on a Turkish cultural core.

In India, during the British rule, the Muslims of the Sub-continent were under a double subjugation, the English and the Hindus. They looked towards the Muslim States in the Middle East for protection. But the Muslim Nations themselves were in a ferment and could not render any assistance to Indian Muslims. The only assistance which the Muslim of India could see to free themselves from Hindu majority rule (because the British were already talking of granting independence to India) was Pan-Islamism. When the British lent support to the dissolution of Caliphate in Istanbul, the idea of pan-Islamism found stronger support by the Muslims of India. In view of the fact that *Shhudhi* and the *Bhagti* movements which were being carried on in India rather successfully, though on a small scale, this outburst was beyond the wildest expectations of the Hindus. It proved that Islam was yet a very powerful force in the sub-continent. But the Indian Muslims did not get the response they expected from other Muslim Nations. They were left with no choice except to either cooperate with Indian Nationalism or have a separate Muslim State in India. Ethnically and culturally speaking the two communities did have a few common mores of life, but the gap was impossible to be bridged. The Muslims were made to feel that they were outsiders and alien to what was Hindu India. This could only be interpreted that, since the Hindus and the Muslims belonged to two different civilizations, and civilizations having a wider realm and a longer span of life, had survived but alien to one another. Thus Pakistan was to be born as a civilization state. Islam is still thought to be the panacea for all evils in the social life of the country. Pan-Islamism is still a living ideology in Pakistan.

The question of progress and development was an unsolved issue for Pakistanis as well, but the analysis was different. In the words of Allama Iqbal, "the most remarkable phenomenon of modern history, however, is the enormous rapidity with which the world of Islam is moving towards the West. There is nothing wrong in this movement, for European culture, on its intellectual side, is only a further development of some of the most important phases of the culture of Islam. Our only fear is that the dazzling exterior of European culture may arrest our movement and we may fail to reach the inwardness of that

[7]Shamloo, Ed., *Speeches and Statements of Iqbal* (Lahore: Almanar Academy, 1945) p. 56.

culture. During all the centuries of our intellectual stupor Europe has been seriously thinking on the great problems in which the philosophers and the scientists of Islam were so keenly interested."[8]

Allama's fear became a reality. Muslim nations, who decided to westernize, imbibed the outward menifestations of Western Culture. The spirit of the West is in an analytical mind. The secret of progress is in industrialization and discovery of the use of the inanimate power. What the Muslims should have learnt were the Western means of production, but they only copied Western methods of consumption without appropriating it with productions at home. The superiority of the West was recognized in all political, ecomomic and cultural spheres.

For a long time, the state of affairs in the Middle East remained such as to defeat every idea of cooperation of Muslim countries. It was interpreted to be a Pan-Islamic movement which had been repeatedly advocated and extinguished since Jamal-ud-Din Afghani. There is nothing basically wrong with the idea of Pan-Islamism but modern aversion towards religion and popularity of secular states, made this idea unpalatable to many. It has been said that the invisible mental background of the act determines its success or failure. As a matter of fact, those who propagated Pan-Isalmism as a political creed, lacked the conviction of ideas and honesty of purpose: those who had faith that unity of Muslim Nations is their destiny, were not given a chance to disseminate their ideas. A common cultureal heritage, friendly outlook and contiguity of non-Arab Muslim states, were factors which inspired some of the Western thinkers towards the making of a Turko-Aryan confederation. Donald N. Wilber, studied "Prospects of Federation in the Northern Tier." The aim, however, was to consolidate. The Northern Tier, as a line of defence against Russia. This thinking degenerated into military pacts as it did not want anything more than that.

Response to Challenge

However, the recent change in the political outlook of the great powers, points towards a possibility of co-existance between them in certain spheres of international relations. The emerging enemy envisaged by the West, is China and not Russia. Under the circumstances, 'The Northern Tier' has lost its previous significance. Proportionately aid and interest in this region has decreased. Not only that, American rush of arms to India, preferential treatment to Greece in the European Common Market and on Cyprus issue, and oil interests shifting to Arabian from Iranian ones, are definitely against the interests of the three nations: Pakistan, Turkey and Iran. Even the leadership in these countries has realized that however hard they may try to become westernized, they remain Muslims in the eyes of the Western Nations—Muslims who fought the Crusade wars. In short it was this disillusionment which created an atmosphere for some tangible steps to

[8]M. Iqbal, *The Reconstruction of Religious Thotugh* (Lahore: Sheikh Mohammad Ashraf, 1958) p. 7.

be taken in the direction of a cooperation. It was the President of Pakistan, a leader from a civilization state, who grasped that all Muslims had a common destiny. He understood that a civilization has wider realm and a longer span of life.

However, the Arabs have not understood the significance of our ultimate destiny. Their fervour for Arab Nationalism is high. So far it has failed to unite the Arabs but it has certainly undermined the cause of Islam. Nationalism is based on hatred ; it cannot unite ; it can only divide.

On the other hand ideological states continue to thrive and develop into larger communities. It goes without saying that there are systems contending to win over the world today, *viz.*, the Western Capitalism, Communism and Islam. In this ideological war, Islam is second to none. As regards the impact of the concept, it has to accomplish the great task of filling the gap of five centuries of intellectual stupor. Islam has to be interpreted in the understandable language of the time *i.e.*, interpreting the economic system of Islam. As long as this section of statecraft remains weak, all others cannot be practised with any success.

However, the seed of an economic cooperation has been sown. In the Istanbul conferance held in the second week of July, 1964 three nations, Turkey, Iran and Pakistan, have agreed to cooperate for development. It is obvious that common economic interests will necessitate some sort of political cooperation as well. This task is not easy, but progress means conquering the difficult.

Let us go back to the question as to which nations would cooperate. The answer was, those which have common interest and background. In the foregoing pages, it has been fully explained that Turkey, Iran and Pakistan have not been brought together only because of the attitude of the West towards them; they have common socio-cultural background and a common history. Ethnically, all are Turko-Aryan people; Turkey having Turkish people and language, Iran having Persian people and language and Pakistan a reflection of Turko-Aryan mixture of people as well as language. Above all, they all have an awareness of a common destiny.

Finally it is to be seen how a cooperation is to evolve. In all the three states today, seventy five per cent of the population is engaged in agriculture. More than fifty per cent of the state revenue is from the land, except in Iran, where oil royalties change the picture. The three are oriented Westward as regards their import trade, the pattern of aid and membership of military pacts. In order to break this circle, economic independence is to be achieved first of all, political and cultureal independence will be forth coming in its own time.

A few suggestions for the growing cooperation may be given.

1) More roads and railways should be constructed to facilitate the movement of raw materials, finished goods as well as people. Some of the existing roads can be improved in the beginning at relatively low cost, *e.g.*, Tehran-Zahidan rout *via* Yezd. It is half the length of that of the one *via* Meshed. Similarly Erzrum-Tabriz road may be improved; a railway line can also be constructed between these two stations to provide easy transport link between Iran and Turkey. A development of the means of transport and communications will be an important step to stimulate trade and hence production.

2) Industrial planning is to be done very carefully. Fortunately, none of the three is so advanced in her industrial establishment that it will have to be re-oriented to suit the regional cooperative pattern. In European Common Market, for instance, some of the uneconomical industrial units were closed down. Turkey, Iran and Pakistan are in their early stages of industrial development, heavy industry has not yet been installed. So it is possible to allow different sections of this region to specialize in different types of industry in accordance with the relative advantages to the quality and quantity of production.

   All industry may be divided into three classes.

   a) Raw Material localized industry.
   b) Market localized industry.
   c) Foot loose industry.

   Raw material and Market localized industries are not difficult to choose site for, but the 'Foot Loose Industry' needs a careful study. The choice of a site for this class of industry depends upon the cost of assemblage of various requirements of a particular industry. It may also be pointed out that a considerably large sector of industry is 'Foot Loose' type. As a first step, an intensive survey of economic resources in each state is to be done. In the list of resources, human resources are to be more carefully studied. When an industry for a common market of the three countries will be established, relative cost of the transport of labour and materials will be a difficult issue. May be the principle adopted will be that such industry is installed in every state according to the size of its population. This principle may not be incorrect, but the competetive cost of production is the first thing to be cared for.

3) In this respect, one feature is to be given special attention. When industry on co-operative basis will be established, raw materials will move from one state

to the other and so will the finished goods. This means an increased commerce between these states. If private enterprise is allowed in commerce, middle man's profit and inter-state dealings will minimize the benefit to the industrialist as well as the consumer. It will be to the advantage of the states if trade is controlled by the respective governments. It may even be desirable to employ socialistic production technique.

4) In planning various industrial concerns, it must be emphasized that priority is given to strategic and producer industries. It is this branch of industry that brings independence to nations. Turkey, Iran and Pakistan are a unit that needs it the most.

5) Basic industry should be owned by the State. If a larger number of industry is owned by the respective governments, it will help the states to spend more on the development of apparently unproductive sector, *e.g.*, roads and rails. Private capital movement towards this direction is very limited. Many would argue that private enterprise is more efficient and competitive than those owned by the state. It has been so because the conditions for the two had not been the same. In private establishments, the inefficient and the lazy had no chance to continue in the job; in government owned concerns, it was difficult to even point out the ineffecient. Given the same conditions or work, government owned industry is as efficient and more competitive than private industry.

In the end it must be recapitulated that basic to even economic cooperation is a common idealism. This can be furnished by Islamic unity. The people of all these states believe that Islam as a religion, has the elasticity, within its frame work to meet the challenge of any age. A reconstruction of religious thought as directed by Allama Iqbal is essential. Lenin used to say that there cannot be a revolution without a revolutionary theory. The same is true for evolutionary developments too. Without a theory or an idealism, the process of growth becomes directionless. It should be noted that at the moment Western Nations have remained silent over the formation of RCD. It is due to two reasons. Firstly they think, it won't last any longer than say, the unity of Syria and Egypt. Secondly, as pointed out before "The Northern Tier" has become relatively less important to the West. But, when this cooperation begins to precipitate into accelerated pace of development measure of political unity it will certainly attract Afghanistan, may be the Arab World and Africa. The West and Russia will not then remain unconcerned. They will try the dissolution of the cooperation by means of fair and foul. If the cooperation is based on economic benifits only, it will tend to break if such benefits are forthcoming from some other quarters. In the last two decades, all three countries of the RCD have depended heavily on aid from the West for their

development. Let this be known that the reason for the formation of RCD is not the inadequacy of that aid; it is, because aid is not a substitute of trade and that the Muslims all over the world have a common destiny.

At this period in history, the U. S. A. and the Soviet Union are formidable political powers. They are capable of destroying any attempts at Muslim unity. It will require great deal of determination, dedication and sober resolution to attain the ideal. The Muslim nations are still at the mercy of those who have a tradition of living on the blood, tears and toil of others. If they continue in their hangover, and do not learn from their past degradation of European domination, they may be sorry for the second time.

SPATIAL DISTRIBUTION OF THE HOUSING AND LIVING CONDITION OF THE PEOPLE OF KARACHI[1]

AMJAD A. B. RIZVI

INTRODUCTION

As a result of contemporary political unrest, significant international migrations have occurred in certain parts of the world.[2] One of such movements took place in the Indo-Pakistan sub-continent, whose partition in 1947 "enforced movements absolutely unparalled in the history of the world".[3] During this troubled period, India and Pakistan are estimated to have exchanged fourteen to fifteen million persons with almost equal number (about 7 million) coming in and going out.[4] There was, however, one important aspect of this phenomenon while people migrated, both from cities and villages, they settled mostly in cities.[5] Among cities, big cities like Karachi received the biggest impact. In thirteen years' time (1947—1961), it quadrupled its population.[6]

The result was obvious. The growth of services could not keep pace with the growth of population. As would appear in the following pages, certain necessities like houses, community facilities and public utilities became seriously deficient. In short the rapid population growth gave rise to following problems in the area of urban development :

1) lack of housing and related facilities.

2) congestion and overcrowding in the older and central parts of the city.

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[1]The paper was presented at the Geography, Geology and Anthropology section of the 17th All Pakistan Science Conference, Karachi, 1965.

[2]For Example West Germany (Berlin) Hungary, India, Pakistan and Hong Kong.

[3]O. H. K. Spate, *India and Pakistan* (London : Methuen & Co. Ltd., & New York : E. P. Dutton & Co., Inc., 1954), p. 110.

[4]W. Mauldin and S. Hashmi, "Illustrative Estimates and Projections of the Populations of Pakistan 1951 to 1961", *Population Growth and Economic Development with Special Reference to Pakistan*, Editor, M. L. Qureshi. (Karachi: The Institute of Development Economics 1962), p. 62.

[5]M. S. Jillani, *The Resettlement Pattern of Displaced Persons in Pakistan*, An unpublished Ph.D. Thesis (Chicago: University of Chicago, 1962).

[6]By the end of 1947, the population was estimated to be 500,000. In 1961, it crossed the 2 million mark (2,044,044) according to the Second *Population Census of Pakistan*, 1961.

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3) increased traffiic beyond the capacity of existing roads.

4) haphazard growth, and

5) indiscriminate mixture of land use.[7]

Hundreds of slum clusters appeared in the city. This is, however, nothing unusual under the circumstances,".....most dramatic examples of accelerated urban growth are the shanty towns."[8] Besides, no detailed study of housing and settlement problems was made with the result that many more associated problems cropped up. The importance of an adequate knowledge of the socio-economic setting in which the comminity development programmes are to be carried out has been well advocated by Earnest Weisman in his address.[9]

With the help of the data from the "People of Karachi Survey "[10] the housing and living condition as prevalent in various areas of the Karachi Metropolitan Area (KMA) have been studied.

THE TOTAL PICTURE

The quadrupling of the population of Karachi in fifteen years' time gave rise to problems in almost every phase of its development, *i.e.*, planning, communication and community facilities. This imbalance between the need and provision has been the basic concern of city fathers.

The most noticeable lag has, however, been in the area of housing. This is displayed by a survey of shelterless persons carried out in 1959. The survey reported 527,535 persons either homeless or living in pavements or temporary tenements. They lived in 250 slum clusters which were conspicuous by sub-standard *juggis*.[11]

The living condition has been well depicted by Nazir Ahmad. "They live packed like sardines in colonies which are disease-ridden..... a case of gross cultural regression, of

[7]Karachi Development Authority, *Karachi Land Use Pattern*, Report No. MP-17, January 1963. (Karachi: KDA, 1963) pp. 5-6.

[8]United Nations, *Community Development in Urban Areas* (New York : United Nations Department of Economic and Social Affairs, 1961) p. 3.

[9]R. Cabrera (ed), *Proceedings of the* 1960 *World Planning and Housing Congress*, Pureto Rico. May 28-June 3, 1960 (San Jaun: Inter-American Planning Society, Commonwealth of Puerto Rico, 1961) p. 32.

[10]S. Hashmi, *et. al*, *Peoples of Karachi—Data from a Survey of Karachi* (Karachi: The Institute of Development Economics, 1964).

[11]Juggy is a simple hut built of mud, tin, bamboo and straw mats. About 160,000 *i.e.*, 30 per cent of shelterless persons reported in 1959 have been resettled in Korangi and North Karachi Town-ships to date, according to information from the Karachi Development Authority.

dehumanization, of degradation which staggers human imagination".[12]

The congestion of people in space which is expressed in terms of number of persons per unit area (density) indicates, though roughly, the state of crowding in a city. Karachi city is becoming denser and denser with the passage of time. In 1951, a square mile contained 4,628 persons (7.2 persons per acre); in 1961, there were 8,316 persons in a square mile[13] (13.0 persons per acre). This was because of the doubling of population during 1951—61.

There is, however, variation in density between various areas of KMA. The density varies from less than one person per acre in certain rural villages in the Malir valley to as high as 700 persons per acre in the old town. In commercial area, the density exceeds 300 persons per acre and in the south and south-western parts it is around fifty due to marshy land. Notwithstanding the within-city variation, one general tendency is noticed, *viz.*, the gradual diminution as one moves radially outwards from the central business district. This central business unit occupies smallest proportion of the area but biggest proportion of the population of KMA. The same is true in all big cities, *e.g.*, ".....in American cities at least the central business district occupies a relatively small proportion of the entire area of the country".[14]

The generalized predominant land use map indicates the indiscriminate mixture of land uses. This has probably led people living in the central areas of the city to move out to newly developed communities in the outskirts. There, too, housing units are installed more rapidly than shops, factories, schools and hospitals.[15] Consequently, commercial and community functions move into residential units.

The size of a typical household in the KMA is 4.4. This figure when, viewed in relation to the fact that a household contains on an average 1.4 rooms and a room contains an average of 3.7 persons, the state of overcrowding in Karachi becomes clear. Compared in this respect to some of the surveyed cities of the Indo-Pakistan subcontinent, the condition of overcrowding appears still more acute.

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[12]N. Ahmad, *Survey of Shelterless Persons in Karachi* (Karachi: Manager of Publications, 1959), p. 2

[13]Office of the Census Commissioner, Ministry of Home and Kashmir Affairs, Home Affairs Division, *Population Census of Pakistan, District Census Report Karachi*, (Karachi: Manager of Publications, 1963) p. iv-5.

[14]P. Gist and L. A. Halbert, *Urban Society*, (New York: Thomas Y. Crowell Company, 1954), p. 98.

[15]As an isolated illustration, out of the 46 schools provided in the KDA's Development Scheme No. 16 (Federal B Area) only one has been built, although more than half of the planned population (15,000) has started living. Similarly there is not a single hosptail or maternity centre, (Karachi Development Authority, *Karachi Primary and Secondary Schools*, Report No. MP-18 (Karachi: KDA January 1963), p. 22.

In respect of the size of households, type of houses and the amenities therein, the housing condition in the city is poor, poorer than in some of the similar cities of Asia. A sizeable proportion of the people (*i.e.*, more than half) lives in poor houses. Three-fourths of the households lack altogether the essential amenities like water and electricity, etc. From the standpoint of such community facilities as schools and hospitals, the backlog is equally serious. Fifty-nine per cent of children in primary age group and thirty-one per cent in secondary age groups attend school. There are 1.7 hospital beds per 1,000 population as against 5 per 1,000 which is the required standard.[16]

Water supply arrangement is poor. Per capita water consumption was hardly two gallons in 1952 as against thirty-five gallons worked out by experts.[17]

Focus of Study

In the study, eight major spatial groups of the Karachi Metropolitan Area based on geographic and density considerations have been identified : 1) Commercial Area, 2) Industrial Area, 3) Upper Residential Area, 4) Middle Residential Area, 5) Lower Residential Area 6) Military Area, 7) Labour Area, and 8) Rural Area (Fig. 1).

The criteria of division are land use and density. The eight areas which have been identified correspond to the natural area, "characterised both by physical individuality and cultural characteristics of the people who inhabit it"[18]. Such homogeneous areas or natural areas are not typical of Karachi only. The metropolitan areas of New York, Chicogo, Philadelphia, Los Angeles and San Francisco contain a great variety of natural areas, each with its characteristic sub-cultures. Geographic and density considerations have been identified.

The housing condition has been studied with reference to the above division. The condition has been viewed from: 1) the extent to which a household is overcrowded, 2) type of houses in terms of strucutre, 3) tenure of houses and, 4) facilities in a household.

Households

In housing studies, reference to a group, rather than an individual should be of interest, because it is the group who inhabit a house. "Household" has been defined "as a family or group of families or of persons living together and eating from the same kitchen."[19]

[16]The standard has been worked out by the Karachi Development Authority, Karachi.

[17]Bartholomew and Associate, *Karachi Water Supply Problems* (a report prepared for the Karachi Joint Water Board, 1952)

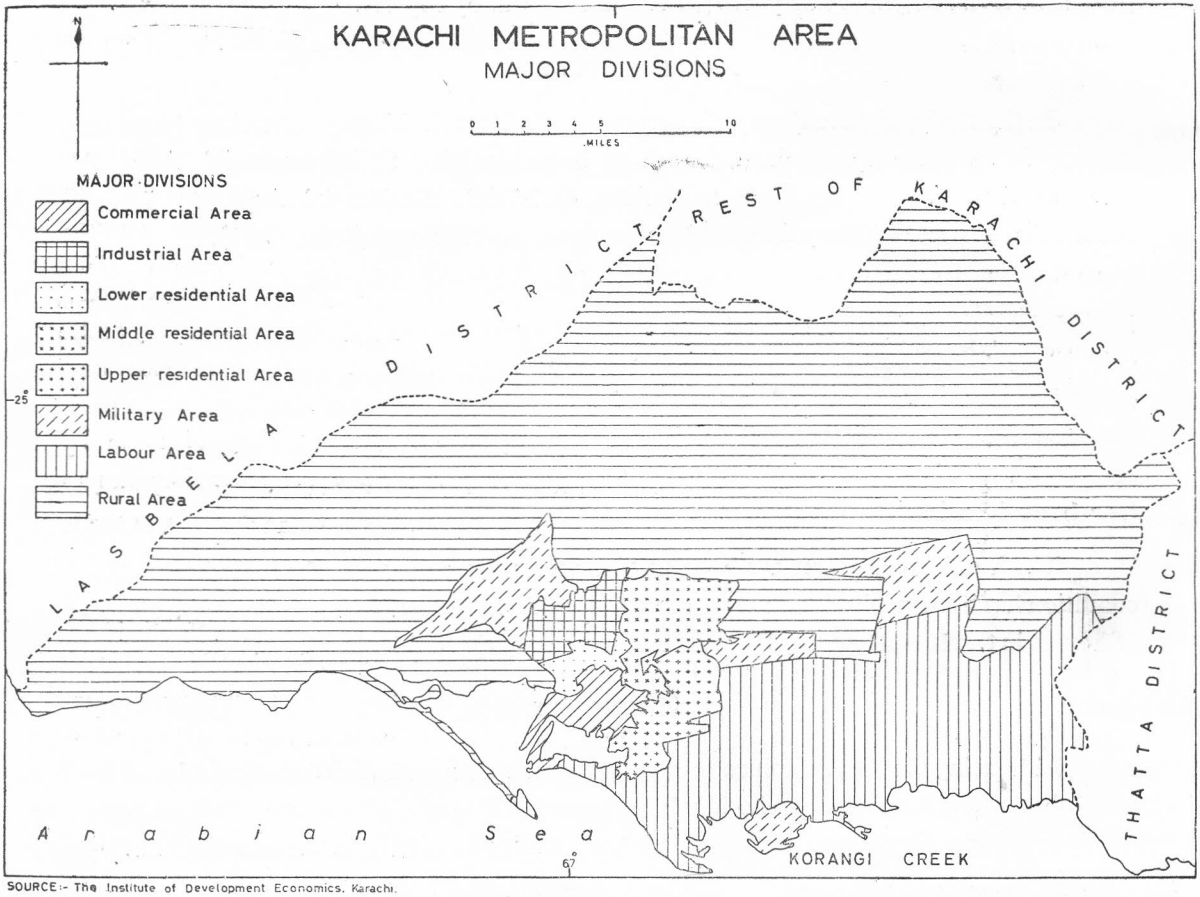
[18]W. Zorbaugh quoted in: E. Merrill and W. Eldridge, *Culture and Society* (New York; Prentice Hall, Inc.) p. 412.

[19]Government of Pakistan, Ministry of Finance, Central Statistical Office, *Report on Sample Survey of Karachi Population*, 1959 (Karachi : Manager of Publications, 1959), p. 46.

This definition of household is the same as that of the United States Census, the Pakistan Census and of such studies like that of Calcutta, Mysore, Ludhyana (India), Amman (Jordan) and Tema (Ghana).

There is a rather low average household size (4.4) for the KMA compared to that of Karachi district (5.3) and the whole of West Pakistan (5.5). In accounting for this disparity, the following points may be kept in view:

1) The 37,000 persons not accounted for in this Survey might belong to a group of big households so as to affect the census figure.



SOURCE:- The Institute of Development Economics, Karachi.

FIGURE 1

2) About 100,000 persons living in newly developed colonies (Korangi, Landhi, etc.) were living at the time of the 1959 Survey in the city's slum clusters. Small *juggi* household group might have turned into big households in more spacious houses,

3) Tendency among *juggi* dwellers to report many household units so as to claim many houses in the rehabilitation schemes, a case not so frequently found in routine census.[20]

4) Some expected lag between a sample and census.

Since, no population displays such a behaviour as to reduce appreciably the household size in a year or so, doubt is cast on the conduct of the survey. The survey records 53,275 single person households; the census figure is 26,370. The former forms 13.2 per cent and the latter 7.2 per cent of the respective totals. This shows wide gap between two figures. Perhaps soldiers in a military barrack eating in a mess were counted as one household in survey and as many households as the number of soldiers in a barrack in sample. They do show a small household size (2.6).

In the presence of this ambiguity, it is safer to take the average of the sample and census figures, *i.e.*, 4.8. This is higher than that of Calcutta and Bombay (4.2) and lower than that of Amman (6.5) which is explainable. Calcutta and Bombay are the two most male cities in the world,[21] the masculinity ratio being 166 and 176 respectively. They consequently contain an exceedingly high proportion (Calcutta 50 per cent) of single person household (Karachi 13 per cent). Noteworthy is also the fact that the immigrant-dominated population of KMA socially and demographically behaves like a settled population.[22]

According to the census figures for Karachi district persons per household and per inhabited dwelling work out to be 5.3 and 5.1 respectively. This is lower than 5.7 and 5.9 for Pakistan and signifies that the peoples of Karachi live less crowded than the bulk of Pakistanis or else dwellings in Karachi are smaller than elsewhere.

This observation should not surprise those acquainted with living condition of big cities in the fast growing countries. However, the closeness of two figures for the metropolis and the country shows that they are both one-household-one-dwelling communities. There is the fear that ".....they (the two figures) under-indicate the true average as they include both the population and the number of institutional households".[23]

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[20]There are reports that during and before the shelterless persons survey, more than usual claims for new ration cards were made.

[21]S. N. Sen, *The City of Calcutta, A Socio-economic Survey* 1954-55 *to* 1957-58 (Calcutta : Bookland Private Ltd., 1960), p. 14.

[22]S. Hashmi, *Demographic Characteristics of the People of Karachi*, 1959 (Karachi: The Institute of Development Economics, 1963).

[23]K. J. Krotki, "First Release from the Second Population Census of Pakistan", 1961, *The Pakistan Development Review*, Vol. 1, No. 2. (1961) p. 76.

Both household and dwelling averages are lower for Karachi than they are for Pakistan as a whole. This may be due to the operation of extended and joint family system to a greater degree in Pakistan.

Significant variation is noticed between major divisions. In typical residential areas people live in big households, the exception being the Upper Residential Area. The skewness of the frequency curve for those areas shows a relative preponderance of middle-sized households. Small households (average 2.6) is the typical feature of Military Area; small households (average 5.0) is the feature of Rural Area.

Following explanations may be advanced for the relatively low household size in the Upper Residential Area.

1) Preponderance of nuclear families in this area.
2) Preponderance of single person households: one-fifths of all single person households of Karachi are in this area.
3) Preponderance of foreigners in this area: almost all the foreigners live in this area.
4) Preponderance of high income and elite class. Small family households and low fertility are their normal socio-demographic characteristics.[24]

The household structures of Commercial Area and Residerntial Area are similar. This may be because the upper storeys of multistoried buildings are residential. In the Military Area the household size is rather low because of the predominance of single person households (61 per cent). Industrial Area is the third claimant of single person households (18 per cent). The people living in these households are in-migrants who come singly from various parts of West Pakistan for economic pursuits.

Two major divisions, Middle Residential and Commercial Area constitute about four per cent of the KMA area, but contain about half of the total households of Karachi. On the other extreme Rural Area, claiming three-quarters of the KMA area, contains only four per cent of its households. This presents the crux of the living problem.

Residential and commercial areas are the most preferred places for living purposes. Rural Area, which is the biggest major division in area, is smallest in terms of population. It contains only a few scattered villages as the dry and waste lands do not attract sufficiently large population.

Type of Habitation

Habitation is identified in this study as a space occupied for dwelling purposes which according to the type of structure is categorised into three: *pucca*, semi-*pucca* and *juggis*.[25]

[24]Hashmi, *op. cit.*, footnote 22.

[25]Besides these, there are two other categories: *a*) "on roof tops" and *b*) "no regular shelter" which have been lumped up under "others"; they are insignificant.

Definitionally a dwelling is "*pucca*" when it is built entirely of bricks, stones or concrete; it is "semi-*pucca*" when it is built partly of "*pucca*" and partly "*kacha*" material. It is *jugi* when it is made of straw, bamboo, sacks and mats,[26] (see footnote 10).

A little less than half of the people of KMA live in *pucca* houses (45 per cent). Of the rest, living in non-*pucca* houses, majority lives in *juggis*. The state of living is further aggravated by the fact that in the slum clusters there is absence of proper roads, open spaces, water and drainage arrangements.

In respect of type of houses, Commercial and Military areas appear superior to other areas; more than three-fifths in the former and four-fifths in the latter area live in *pucca* houses. Commercial Area is the central business district containing multi-storied *pucca* apartments. In large cities like Karachi "business activities of the downtown attract the kind of residents who can pay adequate rents and live in high-rise apartment buildings and value location with convenience access to their place of work".[27] In Military Areas, all structures are *pucca* for obvious reason.

In Industrial Area, houses are poor (*juggis*). This indicates that labourers prefer to live in *juggis* and semi-*pucca* structures near their work places rather than in better houses in a distant neighbourhood.[28]

The fact that three-fourths of the people live in *juggis* in Rural Area should not suggest poor housing. The *kacha* houses which are graded *juggis* by definition are consistent with local needs and are the architectural creation of the peasants. Thus such statistical materials should be substantiated with observation. For example the cities of Mysore State in India have been graded superior to villages because of the relatively large proportion of bricks and stone houses in Banglore city but rightly with reservation: ..... "though more detailed investigations would be required to permit an exact comparison".[29]

In the following table the housing condition in terms of structure of two groups of communities, the residential and functional, has been generalized (Fig. 2).

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[26]Government of Pakistan, *op. cit.*, pp. 46-47.

[27]J. Gottman, *Megalopolis*, (New York: Twentieth Century Fund, 1961) p. 418.

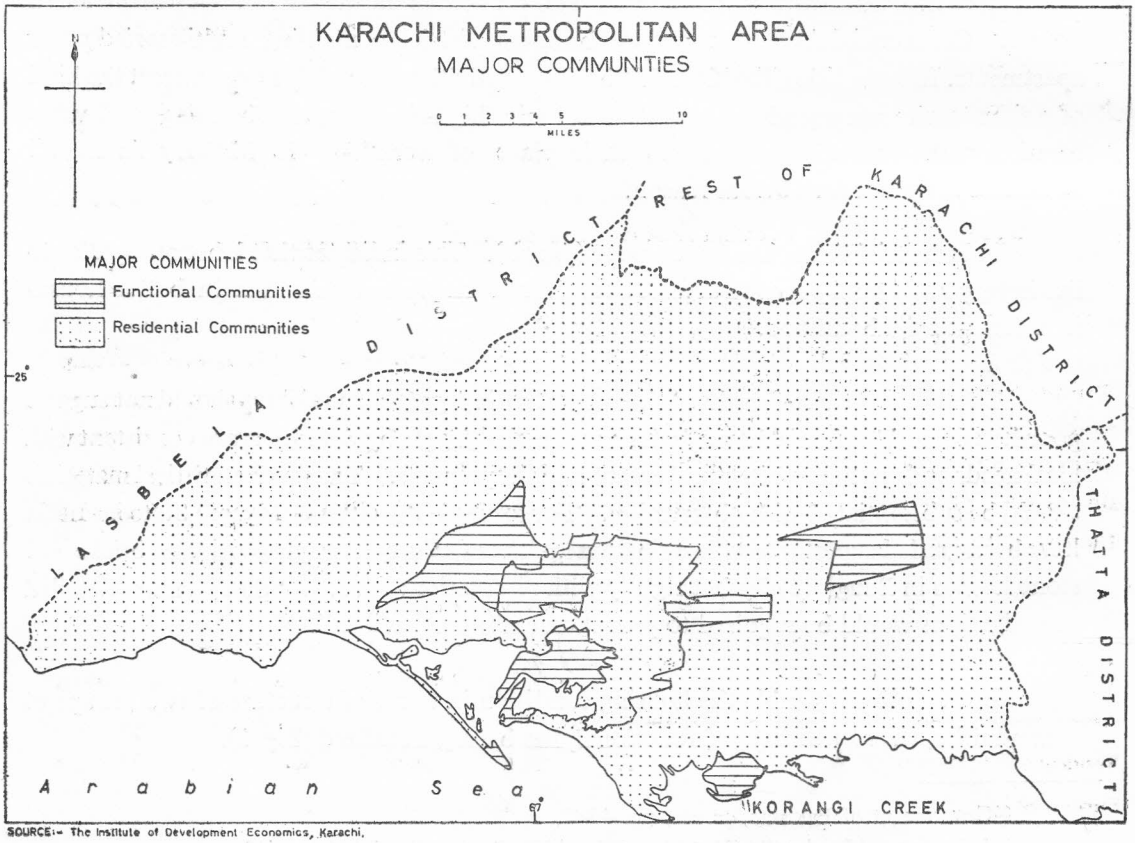
[28]In a survey conducted by the Pakistan Ekistic Training Centre Karachi, great resistence was noticed on the part of the residents of Lyari area against shifting to a new area, The North Karachi Township.

[29]Population Studies No. 34, *The Mysore Population Study* (New York: United Nations Department of Economic and Social Affairs, 1961), p. 75.

Even if an allowance is made for the generalization in the delimitation of major divisions,[30] it appears that the non residential or functional communities have better housing facilities than residential communities.

Tenure of Habitation

Three types of tenure have been identified in this study: 1) self owned, 2) rented and 3) rent free. Their meaning is self-explanatory. It is found that a little more than half (54.3 per cent) of the people of Karachi live in self owned houses, but ownership is confined mostly to poor houses (*juggis*). Residential communities are better than functional communities from the tenure point of view.



SOURCE:- The Institute of Development Economics, Karachi.

FIGURE 2

There is a tendency that in residential areas, people built *juggi* houses mostly for their own living whereas in functional areas (mainly the Commercial Area) houses are built partly for living and partly for renting purposes.

[30]For the sake of keeping contiguous major divisions many groups of chunks were lumped with major divisions under which they were otherwise not qualified for inclusion.

Facilities of Habitation

From the extent of the availability of two types of facilities *i.e.*, water and electricity (facilities I) and bathroom and latrine (facilities II) housing condition appears poor.

It is poorer in terms of facilities I than in facilities II. Among major divisions Industrial, Lower residential, Labour and Rural households are much seriously deficient compared to other major divisions. It is evident that areas which are poor from the standpoint of type of structures are poor from the point of view of facilities too.

Table 1—Type of Habitation by Communities

Communities	All	Pucca	Semi pucca	Juggis	Others
Residential communities	100.00	33.8	21.7	44.2	0.2
Functional communities	100.00	57.6	17.5	24.5	3.0

Source : S.S. Hashmi, The Institute of Development Economics, (Karachi, 1964).

Summary and Conclusion

As a result of the partition of Indo-Pakistan Sub-Continent in 1947, fourteen to fifteen million people were exchanged between India and Pakistan with equal numbers coming in and going out. Among Pakistani cities, Karachi claimed the largest arrivals. In thirteen years it quadrupled its population. The city, unable to cope with such a heavy inflow, displayed serious problems in the area of houses, community facilities, public utilities and their spatial distribution.

Table 2—Tenure of Habitation by Communities

Communities	All	Self Owned	Rented	Rent Free	Others
Residential communities	100.0	60.0	24.8	14.2	0.4
Functional communities	100.0	46.1	34.3	18.3	1.3

Source : Same as in table 1.

One-fourths of the people of Karachi is still shelterless, living in 250 *juggi* clusters. They are twice overcrowded today than they were in 1951. In terms of some indices of overcrowding, today the picture appears poorer than in other surveyed cities of the growing countries of Asia. People live in physical environment characterised by indiscriminate mix-

ture of land uses. Among the new developments, typical residential areas have developed in the outskirts and overcrowding is most common in the central areas of the city.

In the eight major divisions which have been indentified, based on land use and density, the housing condition has been studied. In typical residential areas, people live in big households, the exception being the Upper Residential Area. Small household is the feature of Military Area; big household is the feature of Rural Area. Two major areas, Middle Residential Area and Commercial Area constitute about four per cent of the KMA but contain about half of the total house-holds of the KMA. On the other extreme the Rural Area, claiming three-quarters of the KMA contains only four per cent of its households. Residential and Commercial areas are the most preferred places for living purposes.

In respect of type of house, Commercial and Military areas appear superior to other areas; more than three-fifths in the former and four-fifths in the latter area, live in *pucca* houses. The fact that three-fourths of the people live in *juggi* should not suggest poor housing. The *kacha* houses which are graded *juggis* in the definition adopted are consistent with local needs and are the architectural creation of the peasants. In terms of "type" of houses, the functional communities have better housing facilities than the residential communities, whereas in terms of "facilities" the situation is opposite.

There is an estimated backlog of about 145,000 houses which is an immediate requirement. On the existing rate of house building, we can expect to meet the immediate shortage in twenty years. In order to take care of the immediate need and recurrent demand, arising out of population growth and change from extended to nucleus family system, the rate of house building has to be more than five to six times speedier than what it is today. On the other hand, the plan allocation is extremely meagre. A drastic mobilization of private resources appears to be the only solution.

THE TREND OF INDUSTRIALIZATION IN COLOMBO CITY, THE CAPITAL OF CEYLON

BERNARD L. PANDITRATNA

THE term industry is amenable for various interpretations and implies different shades of meaning. In this paper, the term is applied with certain modifications. Industry includes all those activities involved in the processing of agricultural raw materials effecting a minimum value change of twenty per cent; secondly, those units which use machinery and equipment whose capital value exceeds 50,000 rupees, and power consumption about twenty-five to forty kilowatt hours per day; thirdly those units employing more than eight people (mostly skilled labour) are considered. In respect of power consumption criterion, exceptions are made for labour intensive groups of industries, as those dealing with tea or coconut produce; the textile group, especially tailoring, hosiery, knitting and lace making; furniture all showing variations in scale, but little power consumed.

Historical Perspective

The genesis of industry in Colombo dates far back to about the thirteenth century when Colombo had attained the status of a populous city, the largest in Serendib.[1] Since 1505, it has passed under successive but different colonial regimes; the Portuguese from 1505 to 1658, the Dutch from 1659 to 1795, and the British from 1796 to 1948. The present industrial growth therefore, reflects two distinct phases: the colonial phase, especially the Birtish period after 1830, and the national phase after 1948, especially after 1960 showing a positive policy and vigorous drive in industrialization.

Colombo was a port before it became a city. Some of the first industries such as boat building, repairs, processing of materials used for ships and navigation (sails, cordage, dyes, anchors etc.) were associated with the port. The construction of the Colombo Harbour after 1866 providing breakwaters, jetties, quays, dry docks, patent slip, installation of facilities for coal, oil, phosphate cargoes and water bunkering, graving dock for ship repair, refitting and other marine engineering works, warehouses for storage and other equipment for loading and unloading modernised the port broadbasing the industrial structure[2]. Allied to harbour modernization was the canalization of the Beira lake and reclamation schemes, providing a useful lake front as an industrial annexe to the port. Here were located the mills, factories, godowns, storehouses, barge repair and boat building yards.

Port development measures reflected are economic growth and prosperity of the

[1]Ibn-i-Batuta, *Travels in Asia and Africa*, trans. H. A. R. Gibb (London: 1936) pp. 234—260.

[2]A. B. Prouse, "The History of Colombo Harbour from its inception to 1924", *Transaction*, Engineering Association of Ceylon (1931).

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Colombo hinterland, stimulating a variety of city-forming activities and enlarging the urban-economic base[3]. The import-export economy of Ceylon channelled through the port of Colombo emphasized commercialization and connected industrialization of the port-city. The port become the centre for the processing of agricultural raw materials such as tea, rubber, coconut produce, cinamon, citronella, spices, etc. The location of these processing activities in the city was due to advantage of transport costs; it was cheaper to transport the raw materials and process them in the exporting centre itself. Citing an example, tea goes through a series of processes, those of mixing, blending, testing grading and packing, all done at Colombo firms. The growth of this industry together with the allied industries, tea chests, metal fittings for chests, aluminium foil and the employment prospects they tend to offer have reactivated the full forces of the city, stimulating the trend of urbanization.

The port as the main importing centre of foodstuff (rice, sugar, flour and currystuffs), machinery, textiles, industrial raw materials and other goods has certain specialized activities, those of fumigating, measuring, weighing, sacking, packing and bottling situated close to it. Colombo has become the main assembling and fitting centre of machinery and equipment, maintenance and repairs, the chief distribution centre of vehicles, trucks, cars and all other conveyances. It functions as the industrial workshop for the entire island. But these activities, although typically port-oriented do not effect a change in value to satisfy the required criterion of twenty per cent.

Colombo has experienced a continued growth and development as the capital city since 1505. Its population had steadily and progressively increased to about 500,000 in 1960[4], amounting to about five per cent of the total population of the island. The growth of light consumer industries, especially those processing foodstuffs, drinks and tobacco, light textile and garment making industries and those catering to fashions and changing tastes are typically market-orientated.

The industrial growth and expansion in Colombo city were accompanied simultaneously with the provision of utilities, (electricity, gas, water, sewrage and telecommunication services) both for civic welfare and commercial purposes lending the city an industrial character.

From the town planning point of view, there is a group of industries termed 'dangerous and offensive' which are usually relegated either to the periphery or to special areas[5].

The industrial structure thus may be grouped into five categories (Fig. 1).

1) Industries essentially port-oriented.

[3]B. L. Panditratiana, "The Harbour and Port of Colombo: A Genographical Appraisal of its Functional and Historical Aspects", *The Ceylon Journal of Historical and Social Studies*, Vol. 3, No. 2 (1960) pp. 128—143.

[4]*Idem*, "Colombo City: Its Population, Growth and Increase", *The Ceylon Geographer*, Vol. 14 (1960) pp. 1—16.

[5]*Idem*, "The Functional Zones of the Colombo City", *University of Ceylon Review*, Vol. 19 (1961) pp. 45—60.

2) Market-oriented industries so typical of conurbation.
3) General engineering group.
4) Urban utilities.
5) Dangerous and offensive industries.

Some Factors Influencing Industrial Location in the City

The capital city and port functions, the centralized institutional services and amenities provided, urban utilities and facilities, the large urban market, the splendid road-railway connections of the city with its islandwide hinterland, and general acceptance of the locality as the best venue for industry, all explain why Colombo, at present as it has in the past functions as the chief focus of industrial location in Ceylon.

Colombo about 1900 had one of the best artificial harbours in Asia, emphasizing its world commercial location astride the seaways of the Indian Ocean. Internally, the arterial road system and railways radiating from Colombo linked it with the major provincial and regional centres. This explains its relative ease and economy both in collecting raw materials from locally available sources and also in disposing of finished products islandwide. Even if some of the raw materials and machinery had to be imported, a port location possessed intrinsic advantages over any other site. Its immediate consuming market, serving a radius about thirty miles, encompasses nearly two million or one-fifth of the entire population of Ceylon. Owing to the small size, compact shape and transport pattern of Ceylon, the entire Ceylonese market is easily reachable and economically manageable.

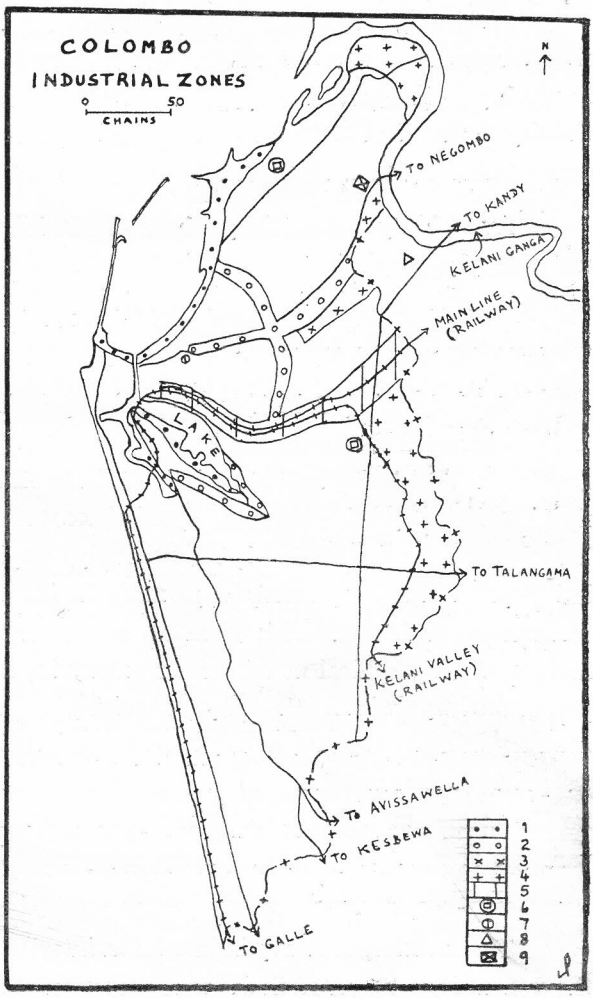

FIGURE 1

SYMBOLS :

1. Port and Lakeside Zone
2. General Engineering Zone
3. Coppra and Oil storage Zone
4. Dangerous and Offensive Industries Zone
5. Railway Industries Zone
6. Water Reservoir
7. Gas Works
8. Thermal Power Station
9. Sewerage works

Considering even an external market, what better location could industry look forward to than at a developed port !

The general requirements of labour for industry could be obtained from the dense population of the city and its region. Technical and skilled type happens to be more available in the developed sector and could readily be attracted to industrial employment in the city.

The foreign entrepreneur preferred sites either in the city or its region because these sites have withstood the tests of time and processes of trial and error. The local entrepreneur, invariably resident in the city, perhaps finds a certain lot available or would acquire it in the city so that he himself can manage and supervise the industry, or make it a family concern eliminating a salaried staff.

Availability of electricity (about 40,000 kilowatt hours consumed daily), pipe borne water supply, gas, industrial chemicals and materials, and institutional facilities, (banking, credit, insurance, market intelligence and research etc.) all taken together influence industrial location and growth in the city.

Capital, mainly British, poured in freely during the nineteenth and twentieth centuries and was invested in consumer industries, general engineering trades and light manufacturing. During the national phase, after independance in 1948, when indigenous capital began to flow into industry at a slow pace, a preference was shown for sites in Colombo or its region. There were several reasons. 1) Traditionally, Ceylonese preferred investments in land to industry. When investments were made in industrial shares, these were in solid going concerns in which the risk element was non-existing. 2) Owing to the operation of factors of geographical inertia and momentum, industrial location and growth had been predominantly within the city exercising strong centripetal forces. 3) Location of industry in other regions, a very recent trend, mainly sponsored by the Government with the private sector watching and hoping to follow the example if proved rewarding. But, so far Governmental industries have not proven conclusively the feasibility and economic advantages of such ventures, thus detracting private investments and selection of sites elsewhere except in Colombo and its region.

The location of heavy industries in interior locations has faced another problem; the difficulties confronted in the transportation of heavy machinery and equipment to such locations because the existing roads, bridges, culverts, etc., constructed by the British, were meant for light vehicular traffic only. Unless the roads and bridges are modernized, broadened and reinforced, regional dispersion of heavy industry will continue to face this handicap. Therefore, modernization of roads and railways is a prerequisite for regional scattering of heavy industries.

The selection of the actual site is a matter of personal choice. Land value is another consideration. Competing urban land uses spiral up land values and affect industry in two ways; in the nature of organization of industry and in dispersing industry. Big industries have their sales offices and show rooms in the expensive core areas, Fort and Pettah where values exceed two million rupees per acre; the workshops, factories, garages, stores are either located in the outer zone, (values, one million to 100,000 rupees per acre) or in the Colombo region where an acre is around 50,000 rupees. The second trend is seen in the growth of two industrial estates, Ratmalana to the south and Ekala to the north of Colombo. These estates offer cheap sites, are equiped with utilities and institutional services and receive Governmental aid thereby attracting new industries.

Government Policy

After 1960, the Government launched a vigorous policy in industrialization. Radical changes in exchange policies were involved: 1) to effect an absolute saving in foreign exchange due either to the falling prices of export commodities or reduction in the volume of such exports; 2) a reallocation of exchange with a view to obtaining the means of production for industrial development; 3) promoting the growth of import-substitution industries based on a scheme of priorities.

High import taxes, restrictive quotas, complete ban of some imports, development rebates, taxation reliefs, reduction of duties on raw materials and machinery needed for local industry, purchasing the goods produced, financial aid and advisory services are some measures undertaken to encourage local industries. For instance, a complete ban of biscuit imports has given local manufacturers the complete assurance of the market. Very high duties on certain imported goods (above 200 per cent) has led to the assembly business, those of refrigerators, batteries, radios, electrical fittings and sound equipment. However, despite the Governmental policy of the development of import-substitution in less developed regions, there had been and still there is a great concentration of industries in Colombo and around it. (Table) I).

Table 1—Industries Approved for Assistance and their Regional Distribution

Year	Total Number	In Colomo City	In Colombo Area	Elsewhere in Ceylon
1961	131	83	17	31
1962	284	159	44	82
1963 (till June)	76	32	13	31

Source: Ministry of Industries (Development Division).

The industries were divided into three categories : 1) small firms with an individual output less than 250,000 rupees, 2) medium size industries whose individual output ranges from 250,000—2,000,000 rupees, 3) large industries whose individual output exceeds 2,000,000 rupees.

Out of the total of 491 industries, nearly one-third were medium and large scale projects. Nearly half the total number preferred locations either in the city or in its region. There is a tendency to engage in projects that require small amounts of capital, leaving the relatively large industries for a later date. About half of the approved projects belong to four branches of industry; textiles, metal goods, chemical products and fertilizer, and electrical apparatus and appliances. Nearly ninety per cent of the capital was Ceylonese. The food and drinks group of industries has a low coefficient of both capital and labour; non-metallic products, a high capital coefficient but a low labour coefficient. The textile group shows a high coefficient of both capital and labour.

A Sampling Survey

Table 2 is a random sampling to shows the numbers and range of industries.

TABLE 2—NUMBERS AND RANGE OF INDUSTRIES

Majority Category	Names of Industries and Number of units					
1. Port-orientated ..	1—A Port group					
	marine engineering .. 6					
	bunkering .. 5					
	1—B Processing agricultural produce for export through the port					
	tea 37	cinamon .. 12	papain .. 2			
	rubber 4	citronella .. 5	pepper .. 2			
	cocount oil .. 10	cocoa 6	cardamons .. 6			
	copra 36	spice 5				
	dessicate .. 21	fibre 10				
	1—C Processing mineral produce for export					
	graphite curing .. 6					
2. Market-orientated ..	2—A Food products, dirinks and tobacco					
	backeries .. 40	dairy produce .. 2	margarin .. 1			
	biscuits 6	cold storage of food 7	vegetable oils .. 3			
	ice cream .. 5	aerated waters .. 8	poultry food .. 6			
	jams, fruits, and sauces 6	beer 1	poonac .. 15			
	confectioneary .. 9	cigarettes .. 2				
	chocolate .. 14					
	food preserves .. 10					

TABLE 2—*Continued*

Major Category	Names of Industries and Number of Units		
	2—B Textile group		
	printing and weaving 20	thread .. 3	
	garments .. 7	towels .. 3	
	braziers .. 4	socks and nets .. 2	
	knitwear .. 3		
	2—C Manufaturing (other than food and clothing)		
	agricultural equipment 3	fertilizers .. 4	pipe fittings .. 3
		fountain pens .. 3	pharmaceuticals .. 12
	asbestos .. 1	floor coverings	razor blades .. 3
	bicycles and tricycles .. 4	and tiles .. 4	rubber goods .. 16
	brassware .. 6	galvanised products 3	spectacle frame .. 3
	batteries .. 3	glass bottles .. 2	safety matches .. 2
	bolts, nuts, and nails 6	kerosine cookers .. 4	shoes and leather 9
			soap 4
	building materials .. 6	miscellaneous toys .. 9	suitcasses .. 5
	carbon paper .. 1	musical instruments 1	toothpaste .. 3
	chemical materials .. 7	instruments .. 1	toilet requirements 8
	domestic	office equipment .. 4	tyre rebuilding .. 7
	utensils .. 8	oxygen .. 1	tin containers .. 2
	drug	paperbags .. 6	
	preparations .. 6	polish .. 6	umbrellas .. 1
	electrical	plastic goods .. 11	wax 1
	equipment .. 2	polythene film .. 3	
	2—D. Typically urban		
	printing 44	furniture 12	
	publishing 36	jems, jewellry and smithing .. 42	
	photographers 31		
	dyers 19	chemists and druggists .. 59	
3. General Engineering.	General engineering		
	motor dealers, repairers and servicing units 37	builders and civil engineering firms .. 26	
	assembly of :—	general repairs of :— ..	
	electric fans 2	optical goods 12	
	refrigerators 2	refrigerators 10	
	sewing machines 5	sewing machines 16	
	steel products 5	radios and electrical equipment .. 31	
	watches and clocks .. 2	batteries 7	

TABLE 2—*Continued*

Major Categories	Names of Industries and Number of Units
4. Urban utilities ..	Urban utilities electricity (thermal and hydel) generation and distribution. gas, generation and distribution. sewage, treatment and disposal. water, treatment and distribution. repair facilities for urban utilities and amenities (trolley, bus, railway etc.
5. Dangerous and offensive industries ..	Dangerous and offensive industries Those having the following features :— danger of storage; kapok, copra, timber etc. offensive small; leather, certain gases. inflamable chemicals; oxygen, carbon di oxide etc. burning; limestone quarrying; lime, kabook and metal large plant lay out; tiles and bricks

Sources :— *Ferguson's Ceylon Directory*, 1962; Ministry of Industries (Development Division).

AREAL DISTRIBUTION AND COMMENTS

Despite the heavy frequency of sea-borne traffic converging on the port, and a shipping tonnage exceeding fifteen millions, there are few marine engineering workshops. These are handicapped owing to lack of space, lack of up-to-date equipment and dearth of trained technicians. Alternative locations for marine engineering yards along the lake's waterfront are neither available nor economically feasible. But, for boat building, barge and lighter repairs, the lake front offers an ideal venue. In fact, most of the new boat building and repair yards are located there. Colombo is a popular bunkering port mainly due to its central position and the fact that facilities are available there. Although coal bunkering has declined, oil bunkering has improved. About 1400—1500 ships call at the port for oil bunkers and the quantity sold is about 500,000 tons per year. About 3,000 ships called for water bunker, and the water intake is about 850,000 tons per year[6].

Those firms processing agricultural raw materials for export also combine other commercial functions (retail and distribution) and are widespread within the city. However, Slave Island—Union Place areas, where there is a concentration of tea firms combine the advantages of space, easy access for lorry transport and proximity to the port. The curing, smoking and processing of rubber, formerly confined to a zone along the eastern waterfront of the Beira lake (Municipal regulations Order No. 7866 of 3.7.1931) do not

[6]Panditratna, *op. cit.*, footnote 3, p. 143.

exist as these operations are carried out now in the producing areas. Industries based on rubber such as the manufacture of toys, decorative articles, mats, cushions and tyre retreading firms are widespread. The coconut group of industries occupy the eastern fringes, along the Kelani—San Sebastian canal system—and Grandpass where safe storage facilities are available. Coconut oil which requires special handling as an export cargo has storage yards along the eastern sector of the harbour foreshore.

The market-orientated industries (2—A and B) are both numerous and widespread, conforming to a specific pattern and stage of growth and reflecting the state of economic development. Most of the units are small to medium-size, catering primarily to the urban market. Few large-size industries cater to the entire island's market; the products being distributed mainly by vans and lorries. Maliban Biscuit Manufactories Limited serves not only the entire requirements of the home market, but exports also to Bahrein. Prior to recent restrictions. (about January, 1964) the local market was so flooded with shirts, garments and ladies wear, that some were exported.

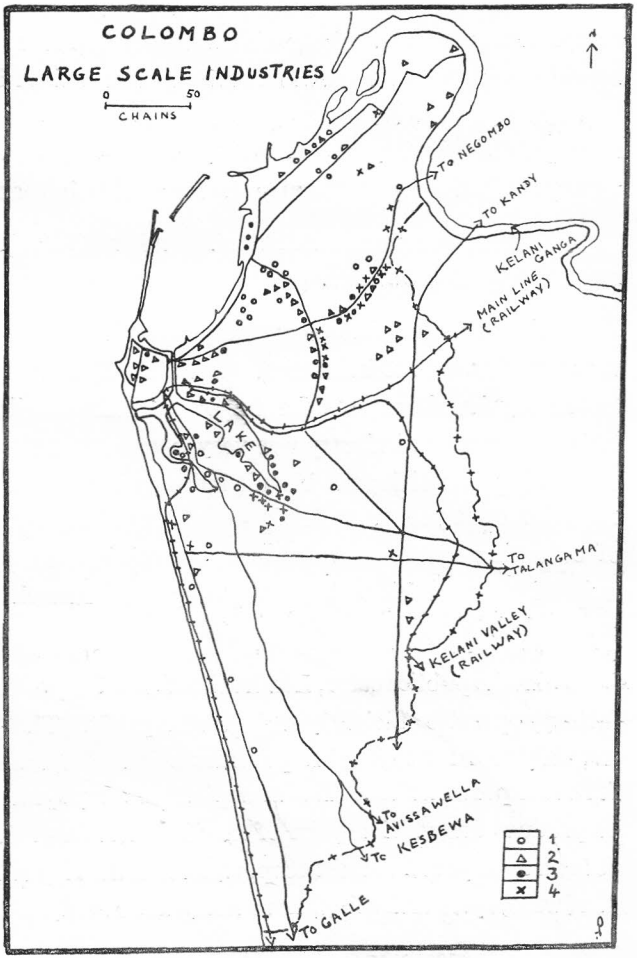

FIGURE 2

SYMBOLS :

1. Industries Processing Foodstuffs, Drinks and Smoke
2. Manufacturing of Light Goods
3. General Engineering
4. Motor Firms

The manufacturing industries (2-C; Fig. 2) received a fillip due to the new Governmental policy. The established largescale and some medium-scale industrial enterprises, originally based on foreign capital and now partly sharing with local capital, have intensified their manufacturing activities. Seveal large firms not only manufacture a series of products, but also combine several commercial and business activities. This makes, it difficult to

calculate the proportionate share of manufacturing in these units. For instance, Brown and Company Limited, which employs more than 1,000 people and has an output of more than three million rupees, manufactures tea winnowing and dust extraction plants, oil filter presses and equipment for the tea, rubber and oil industries; they also undertake electrical installations, repairs and service to all types of equipment and radios. They combine these manufacturing aspects with other business, for they are the estate suppliers of industrial goods and raw materials and the local main agents for a variety of imported industrial machinery, equipment and goods. An establishment of Unilever at Colombo, known as Lever Brothers, manufactures soaps, margarine, edible fats and oil, toilet preparations, toothpaste, washing powders and crude glycerine. They also handle the entire distribution and marketing of these products in Ceylon. The Ceylon Cold Stores manufactures ice, ice cream, aerated water, confectionary and is also the main distributor of frozen food.

There are several medium-size and small-size Ceylonese firms operating as Government approved industries.

Allocation of foreign exchange is a vital and deciding factor in both grwoth and also the rate of growth of industries. When the Government faces an acute shortage of foreign exchange, the allocations for imports are drastically reduced. Recently (after January, 1964) the garment industry was very badly affected due to restrictions in the importation of clothing materials; the biscuit industry because it could not import gelatin; food preservation owing to the lack of essences; confectionary manufactures owing to the shortage of colouring matter and essences, alluminium wrappings and cellophane paper. Small industries are unable to import spare parts for machinery; consequently, industrial growth is retarded.

In the public sector, Leather Products Corporation at Mattakkuliya (tannery and shoe factory) operates efficiently and shows a profit. The present expansion programme intends not only to cater to local requirements from footwear and other leather products, but also for an export market. The new plant and equipment when fully installed would be able to produce one million pairs of shoes, or ten times the Corporation's total output in 1962[7]. It is also proposed to start corporations in the city or its region for the following industries; hardware, tyres and tubes, flour mill, hardboard, fertilizer, motor spares and oil refinery.

Numerically industries of (2—D) are significant. The largest and established firms for printing, publishing, furniture, jewellry, photography, chemists and druggists are in the Fort and Pettah, (core area) whereas their new branch depots are established at secondary cores, the junction centres in the outer zone. Some of the printing and publishing firms, although scattered, show a locational relationship with Government departments and educational institutions.

[7]Central Bank of Ceylon, *Annual Report for* 1962, p. 106.

The civil engineering and building firms (3) are found mostly along Skinners—Panchikawatta Roads, intermingled with the stores for hardware and industrial goods. Most of the motor firms, garages and service stations are flanking Prince of Wales Avenue, Panchikawatta—Darley Roads, Union Place—Turret Roads; very accessible roadways where adequate space is available for show rooms, repair yards, servicing, assembling of machines and storage of spare parts and other goods.

Mechanical, electrical, and sewage treatment works, general repairs workshops, gas and power generating stations, connected with the public utilities (4) occupy special yards within the city. The industries in category 5 have nuisance features such as noise, odours, pollution, fire hazards, waste disposal problems and sometimes require large plant layout. These features have directed the siting of these industries towards the less crowded and relatively open lands towards the north and north-east of the city. Certain trades in this category, however, occupy sites within the commercial and residential areas, as those for the manufacture of matches, gas, oxygen, dyeing of fibre, etc. But, such premises are enclosed by high walls to ensure safety.

The industrial character of the townscape is neither imposing nor conspicuous. Most of the industrial units occupy one-floor building blocks intermingled with commercial, residential and institutional buildings[8]. The towering chimneys of Wellawatta Spinning Mills and the British Ceylon Corporation; the thermal unit at Grandpass the Gas Storage tanks at Pattah, the Oil installations at Bloemendhal; water filtration units at Maligakanda; fishery storage and by-product factory at Mutuwal; the sewage treatment works at Madampitiya; and few storeyed industrial firms lend the city an industrial appearance.

Recent Trends

The Central Bank Annual Report, 1963 divides industries into three categories—consumer goods, intermediate goods and investment goods. In 1962, the value of consumer goods amounted to about 275.1 million rupees, and Colombo's share was about three-fourth of this total. Production was highest in miscellaneous chemical products; pharmaceuticals, cosmetics, soaps, cleaning compounds, matches and toothpaste. Their total value was fifty-six million rupees. Tobacco products came second with 39 million rupees followed by garments, 38.4 million rupees; miscellaneous food preparations, 33.6 million rupees; biscuits and confectionary, rupees 28.8 million; footwear and leather products 22.3 million rupees. The biggest increase in production in 1963 compared with 1962 was registered by the garments industry, 9.1 million rupees, while the value of biscuits and confectionary production increased by 6.9 million rupees. Miscellaneous pharmaceutical products rose by 4.5 million rupees, and tobacco products by four million rupees.

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[8]Panditratna, *op. cit.*, footnote 5.

In the range of intermediate goods, value of production was 126.8 million rupees. Cattle and poultry food, oils and fats, dessicated coconut accounted for 113.5 million of the total. The value of investment goods was 30.4 million in 1963. In this category, the value of metal products (barbed wire, wire nails and galvanised products) increased to 5.7 million, rubber products to 2.2 million, cement and cement products to 22.5 million rupees.

Sixty-two per cent were small firms with an individual output less than 250,000 rupees; twenty-nine per cent medium-sized, output ranging from 250,000 to 2,000,000 million rupees and nine per cent large firms with an output exceeding two million rupees. While 7.5 per cent of the total value is produced by Sixty-eight per cent of the firms, as much as Sixty-seven per cent of production is concentrated among nine per cent of the firms. The disparity in the output is marked in a number of industries. For example in biscuits and confectionary two firms account for fifty-two per cent of the total output, while forty-four firms share twelve per cent. In the garment industry six firms share seventy per cent, while thirteen firms account for only 2.7 per cent. In miscellaneous chemical products four firms handle seventy-four per cent, while forty-nine firms account for 5.7 per cent. One firm is responsible for fifty-seven per cent of the total output of aerated waters, while twenty share 11.5 per cent. Three firms dealing with footwear and leather products account for 91.5 per cent. As much as seventeen per cent of the industrial workforce is employed in garments, biscuits and confectionary industries.

Industrialization policy and progress have been badly handicapped owing to the acute shortage of foreign exchange. A new unit has been set up to study the following functions: 1) to make suggestions as to how the foreign exchange made available can be best channelled to import-substitution industries, 2) to report on the transfer of raw materials and machinery from non-essential (for instance, packing materials, joss sticks, travel and handbags) to essential import-substitution industries, 3) to ensure that new industries benefit from the scheme of priority exchange allocations introduced recently.

For this purpose, the industries have been grouped into three categories: 1) high priority industries. The forty two industries in this category are:—Spinning and weaving of cotton, weaving of syntahetic textiles, shirts, banians, sanitary towels, underwear, socks, surgical bandages, biscuits, softdrinks, mineral waters, manufacture of tea and rubber machinery, alluminium hollowware, bicycles, bateries, electric bulbs, aluminium foil, accumulators for vehicles, metal fittings, metal containers, galvanized buckets, barbed wire and staples, wire nails, woodscrews, asbestos cement products, glass, spun and cure fibre and matches; toothpaste, toothbrushes, razor blades, pencils, ink, fountain pens, footwear, crown corks, paper bags, cartons, cardboard boxes; pharmaceuticals, oxygen and tanning materials 2) industries in production during 1963 other than category 1, 3) new industries,

The high priority industries will be granted an advance allocation of seventy five per cent of their last year imports. Industries in category 2 will be given forty per cent and new industries in category 3 will be granted their full requirements having regard to their essntiality and urgency of applications.

In the trend towards progressive industrialization of Ceylon, Colombo city, no doubt, is bound to play a leading role. Its historic advantages, those of inertia and momentum, present day magnetism and centripetal attractions and future lead are significant. The capital city together with the two industrial estates in its region (Ratmalana and Ekala) will feature prominently in an emerging and dynamic Industrial Geography of Ceylon.

NEWS AND NOTES

SEVENTEENTH ANNUAL ALL PAKISTAN SCIENCE CONFERENCE, KARACHI, FEBRUARY 12 to 17, 1965

The Seventeenth Annual All Pakistan Science Conference was held in Karachi from February 12 to 17, 1965 under the auspices of the Pakistan Association for the Advancement of Science. This year it was the University of Karachi which played host. The venue of the conference was the university campus. Dr. S. D. Chaudhry, Vice-Chancellor of the East Pakistan Agricultural University was the General President.

The six-day long Science Conference was well organized and marked another step forward toward scientific endeavours in our young country. The main features of this conference were : Address of the General President, presentation of research papers and the addresses of the Sectional Presidents. The meetings were split into eight sections one of which was "Geology, Geography and Anthropology". The participants included, in addition to Pakistanis, the scholars from other countries of the world.

The sectional meetings were well attended and many valuable papers were contributed to various fields of science and technology. The Conference concluded successfully with excursions to Mohenjodaro, Thatta and Bhambhor, the places of historical and archeological interests.

GEOGRAPHY

For geographers the Geology, Geography and Anthropology section of the Conference provided opportunity for presentation of papers and exchange of ideas. The meetings of this section were presided over by Dr. Maryam K. Elahi of the Geography Department, University of the Panjab. Dr. M. Z. Farshori of the Geology Department, University of Sind, acted as secretary.

A good number of geographers from all over the country had gathered for attending the meetings. However, the bulk of the geographers came from the universities and their affiliated colleges. As in the past the Department of Geography of the University of the Panjab, under the leadership of Professor Kazi. S. Ahmad, was fully represented with its staff and students. In addition to the local students of geography of the University of Karachi the Post-graduate Geography students from the Government College, Rawalpindi, also attended the sessions in Geography. Fourteen papers pertaining to geographical problems were read and lively discussion evoked. The meetings concluded with the presidential address given by Dr. Elahi on the "Efficiency of Agriculture in West Pakistan."*

PAKISTAN GEOGRAPHICAL ASSOCIATION

The annual meeting of the executive committee of the Pakistan Geographical Association was held on Feburary 16, 1965 in the Physics auditorium of the University of Karachi. Following were present.

1. Dr. Kazi S. Ahmad.
2. Dr. Nafis Ahmad.
3. Dr. Maryam K. Elahi.
4. Dr. Col. Khalil U. Kureshy.
5. Mr. Muhammad M. Memon.

Election of the Officers

Following were elected to various offices of the Association excepting that of the President's office which is held by Dr. Kazi S. Ahmad as life president.

Vice-Presidents

Dr. Nafis Ahmad, University of Daca, Dacca.
Dr. Hamid-ud-din, University of Peshawar, Peshawar.
Mr. Muhammad M. Memon, University of Sind. Hydrabad.

*This address and the abstracts of the geography papers contributed to this section are being reproduced in this issue.

Secretary-Treasurer

Dr. Maryam K. Elahi, University of the Panjab, Lahore.

Members of the Executive Committee

Prof. Muhammad A. Patel, University of Rajshahi, Rajshahi.

Dr. Col. Khalil U. Kureshy, Military Acadamy, Kakul.

Dr. Iqtidar H. Zaidi, University of the Panjab, Lahore.

Dr. (Miss) Jahan Ara Malik, Government College for Women, Rawalpindi.

Dr. Mushtaq-ur-Rahman, University of Karachi, Karachi.

Mr. Amjad A. B. Rizvi, West Pakistan University of Engineering and Technology, Lahore.

Constitution

It was proposed at the meeting that the constitution of the Association be reprinted with certain changes which might be suggested by the members. The proposal was accepted and the President has been authorized to deal with the matter.

IQTIDAR H. ZAIDI

ABSTRACTS OF GEOGRAPHY PAPERS PRESENTED AT THE GEOLOGY, GEOGRAPHY AND ANTHROPOLOGY SECTION OF THE SEVENTEENTH ANNUAL ALL PAKISTAN SCIENCE CONFERENCE HELD AT KARACHI FROM FEBRUARY 12 TO 17, 1965

LAND USE SURVEY OF KHANOWALI AND GUDPUR VILLAGES

Maqbool Ahmad, Hailey College of Commerce, Lahore.

Sample land use surveys in several hilly and plain areas of Pakistan have already been carried out by the Department of Geography, Panjab University, Lahore. The present study is an attempt to depict the land use pattern in the Active Flood Plains. For this purpose two villages Khanowali and Gudpur which lie in the Active Flood Plain of the Sutlej have been selected. The study clearly marks the differences in the land use pattern in these areas which are affected by the occurrence of frequent floods. Changes in the land use pattern of these villages after the heavy floods of 1955 have also been studied in detail.

URBAN HOUSING PROBLEM IN WEST PAKISTAN

K. U. Kureshy, Pakistan Military Academy, Kakul.

The exact degree of housing shortage and the resultant overcrowding in the urban areas of West Pakistan is difficult to ascertain for want of data. But it is estimated that a housing back-log of "substantial proportions" exists.

The census definition of a 'house' has not undergone a change since 1911. The figures of the last five decades are, therefore, comparable. These figures, together with the population statistics, indicate the following :—

1) While there has been a progressive increase in the decennial rates of growth of urban population, the percentage increase in the number of houses has been variable.

2) The increase in the number of houses has not kept pace with the population increase. The gap widened during the period 1931-1961.

3) In general, housing shortage is in direct proportion to the size of the town, implying that the 'cities' as a size class are worst affected.

The paper seeks to analyse in some what greater detail the shortage of housing in the cities of West Pakistan as reflected in the census figures: 1) Persons per house, 2) Household by tenure, and 3) Percentage of household by number of persons and by number of rooms.

The intra-town variations in overcrowding cannot be computed from the published figures for which data gathered as a result of field work have been employed.

PHASES OF SETTLEMENT IN ADANA PLAINS, TURKEY

A. H. Malik, University of the Panjab.

The paper deals with the historical aspects of settlements in the Adana plain from the first period of settlement by Hitites to the present times.

Greek and Roman periods stand out for the contribution made in the building of planned cities and towns.

The 8th century occupation of the plain by Arabs brought improvements and construction of new towns and rural settlements. The destruction caused by the Byzantines during the attack on Arabs in the 9th century gave a set back to the growth of settlements in the area. For quite a long time it served only as summer resort for the Turkoman nomads.

The new phase of settlements started when the last Ottoman kings introduced some reforms and ordered forced settlement of the nomadic tribes in the plain to utilize its potential resources. Some of the important aspects of settlements during this period have been discussed elaborately.

A GEOGRAPHICAL STUDY OF THE TRADE CARRIERS OF THE PORT OF CHITTAGONG

S. H. H. Naqavi and M. Karim, University of Dacca.

This paper deals with the carriers, both internal and external, of the trade of the port of Chittagong; it also takes into consideration the number of the carriers involved, their tonnages, the frequency of their visits and the types of the cargo handled by them.

As far as the internal trade carriers of the port of Chittagong are concerned, railways and inland craft are important whereas roads and airways are insignificant, although in certain areas or in some cases, the role of these two also becomes significant. Chittagong enjoys a railway freight rate advantage in most of areas lying to the east of the river Jamuna and it is there that the railways are supereme carriers of Chittagong's trade. The rather thick network of navigable waterways in East Pakistan has promoted considerable carriage of Chittagong's trade by inland craft as well.

Among the external trade carriers, ships originating in or employed for West Europe, particularly the United Kingdom, are the most important. With the exception of Australia, the ships of all other continents touch the port of Chittagong.

SOME ASPECTS OF THE MORPHOLOGICAL CHARACTERISTICS OF THE JAMUNA FLOOD PLAIN IN EAST PAKISTAN

Harunur Rashid, University of Dacca.

The area under the present study is the left-bank flood plain of the Jamuna river in Mymensingh district. The primary objective of this paper is to study the alluvial morphology of the Jamuna flood plain.

The flood plain of the Jamuna is the result of coalescence of flood plains of some older streams, which belonged to the Brahmaputra system, and which are now in a deteriorating condition. This deterioration in the Old Brahmaputra distributaries has occurred due to the recent diversion of the Brahmaputra from its old course to the present course of the Jamuna.

Most of the older streams of the Jamuna flood plain exhibit meander pattern with usual associated features. The sediments deposited by them are mainly silt and clay. On the other hand, the Jamuna is a braiding stream, features of which are much different from those of the meandering streams. Channel bar is the main featu e of the Jamuna river. A major proportion of the sediments deposited by the Jamuna is sand. The Jamuna is actively engaged in widening its channel since the diversion of the Brahmputra in 1830. The process of channel widening was most active upto 1942; since then the river has been showing a comparative stability.

SOME ASPECTS OF THE FUTURE RELATIONSHIP BETWEEN RURAL POPULATION AND AGRICULTURE IN EAST PAKISTAN

M. Islam, University of Dacca.

In East Pakistan, with limited industrial development and an urban population of only about 5 per cent, the vast majority of people are directly dependent for their livelihood upon the land. Among many other factors, high population density (922 persons per square mile) is a major factor in the economic development of East Pakistan. Besides, there has been a phenomenal rise in population density over the last few decades, which in a rural economy has obviously further increased pressure on land. The present density of rural population per square mile for the whole of East Pakistan is 812 but if the rural population density per square mile of crops is taken into consideration, the corresponding figure for East Pakistan as a whole would be over 1400, which is one of the highest in the world, probably exceeded only by parts of Java, Madura and parts of South China, and the Nile Valley.

It is the objective of this paper to study the present density of rural population as well as the density of rural popultion projected for 1971, and also to provide a better understanding of the future relationship between rural population and agriculture in East Pakistan. A knowledge of the present and projected density of rural population for future would be highly desirable so that the possibility of bringing about desired improvement in this relationship may be assessed.

For the study of the present density of rural population, 1961 census figures have been used. For future study, the author has tried to devise a method which would give maximum accuracy as to the projection of rural population density for 1971 at subdivisional level.

In the conclusion the author has emphasized that by analyzing the present pattern the future relationship between rural population and agriculture may not be properly ascertained. The question is to what extent is the land capable of supporting rural population under the present level of technology as well as under an improved level of technology? There is a need, on the one hand, for a detailed factual, objective study of the present use of the land—to be more precise, agricultural land use study in East Pakistan—and for an evaluation of the actual and potential resources of the country on the other hand. The results that may be obtained by such an analysis might lead to the proper understanding of the future relationship between population and agriculture in East Pakistan.

URBAN PATTERN OF EAST PAKISTAN

Fazal K. Khan, University of Dacca.

East Pakistan is very densely populated but it is one of the least urbanised areas of the world. However, the urban population is steadily increasing. The increase has been registered by the growth of existing towns and by the development of new ones. All the towns, however, are not growing at the same rate. The larger ones are growing faster than the smaller ones. Again, some towns exhibit erratic growth, some are stagnant, while some have recorded a decline. This differential growth of towns is inevitable but urbanisation is now an established trend in East Pakistan. As such, time has come that a planned rather than haphazard growth of towns be allowed. For that it is necessary to analyse the present urban pattern of East Pakistan, so that the future can be visualised and urban planning may be done accordingly. With this end in view, an attempt has been made in this paper to analyse the over all and the differential growth of towns in East Pakistan.

ELECTION DATA ANALYSIS AS A TOOL OF RESEARCH IN POLITICAL GEOGRAPHY

Hamid-ud-Din Ahmad, University of Peshawar.

A survey of literature on Electoral Geography reveals varying degrees of success achieved by researchers in this vital field of Geography. Differences in concept and methodology may, perhaps, account for this partial success. As a consequence there seems to be no continuity in the theme of research. Of late some scholars have even begun to question the use of Election Data Analysis as a legitimate form of geographical research. However this has been effectively taken care off by such contemporary political geographers as Hartshorne, Krebhiel, Prescott, Miller, *et. al.* In fact the latter day clarification and elaboration of the function and scope of Political Geography has made it all the more imperative that Election Data Analysis be carried out more systematically and extensively so as to make greater sense out of the political mosaic. It does not mean the rejection of the old dichotomist approach of early European scholars where the political character of the people was analysed in terms of religious affiliations (Catholic or Protestant) or physical setting (highlander or lowland people). Rather the new approach evnisages that along with the older postulates a whole set of new ones, such as the development of the Modern Secular Society, Urban and Suburban Growth, Occupational Structure and Peer Groups, Economic Growth or Retardation, Racial and Ecological Factors, etc. etc. be employed as meaningful postulates. These could then be subjected to a variety

of cartographic and quantitative methods of analysis: ranging all the way from Line graph and Choroplethic Maps to Simple Chi (X^2) square Tests, to highly complex Multicorrelation and Curvilinar relationships.

INITIAL DISTANCE AS A FACTOR IN THE MEASUREMENT OF MARKET POTENTIAL: THE CASE OF WEST PAKISTAN.

Iqtidar H. Zaidi, University of the Panjab

The investigation has been carried with two objectives.

1) To measure and map the magnitude of market potential on the basis of varying initial distances from the point, for which market potential is measured to its accessible market.

2) To interpret the areal pattern of market potential emerging from the changes in initial distances.

These objectives stem from the assumption that variation in initial distance from a point to its accessible market substantially changes the spatial pattern of market potential in a given area.

Market potential has been defined as the summation of markets accessible to a point divided by their distances to that point *i.e.*, $P=\Sigma\frac{M}{d}$. Population has been taken as an index to market with *tehsils* as basic unit, whereas the distance is represented in miles. In all 43 cities have been selected for this study which have ultimately served as control points for the isopleth maps of market potential. The market potential of each of these cities has been measured in accordance with each of the following initial distances separately, *viz.*, radius of the area of each city, 10, 50 and 100 miles.

It has been found that the areal patterns emerging from various initial distances are directly related with geographic position of the cities with reference to population density and transportation facilities. The high persists around Lyallpur; and Karachi loses its significance as the initial distance increases.

SPATIAL DISTRIBUTION OF HOUSING AND LIVING CONDITION OF THE PEOPLES OF KARACHI

Amjad A. B. Rizvi, West Pakistan University of Engineering and Technology, Lahore.

As a result of the partition of Indo-Pakistan sub-continent in 1947, fourteen to fifteen million people were exchanged between India and Pakistan with almost equal numbers coming in and going out. Among Pakistani cities, Karachi claimed the largest arrivals. In thirteen years, it quadrupled its population. The city, unable to cope with such a heavy inflow displayed serious problems in the area of housing, community facilities, public utilities and their spatial distribution. This study exposes some of the problems discovered in the "Peoples of Karachi Survey 1959", and their implication.

One-fourths of the peoples of Karachi are still shelterless, living in 250 slum clusters which are conspicuous by sub-standard *juggis*. They are twice overcrowded today than they were in 1951. In terms of such indices of overcrowding as persons per household, families per household and persons per room, the picture appears poorer than in other surveyed cities of the growing countries of Asia, like Calcutta, Bombay and Hong Kong.

Eight major areas based on land use and density have been identified and housing condition studied with reference to these. The condition has been viewed from 1) the extent to which a household is overcrowded, 2) type of houses in terms of structure, 3) tenure of houses, and 4) facilities in a household.

The paper concludes with an estimated backlog of about 145,000 houses which is an immediate requirement. On the existing rate of house building, we can expect to meet the immediate shortage in twenty years. In order to take care of the immediate need and current demand arising out of population growth and change from extended to nucleus family system, the rates of house building has to be more than five to six times speedier than what it is today. On the other hand, the plan allocation is extremely meagre. A drastic mobilisation of private resources appears to be the only solution.

PHYSIOGRAPHIC DIVISIONS OF QUETTA-PISHIN DISTRICT

S. Hasan Naqvi and Amjad Rizvi, West Pakistan University of Engineering and Technology, Lahore.

Geologically, Quetta node is the meeting place of three mountain systems : Toba Kakar, Mashlakh, Chiltan, Kard and Zarghunes Ranges. These ranges are the result of the thrust from eastern, south western and south eastern sides.

Physiographically, Quetta-Pishin district compirses mountain ranges and alternating valley systems. The ranges are from 7,000 feet to 12,000 feet high and the valleys lie on the average height of 5,500 feet. The valley bottoms are of fine-grained alluvium and are gi dled by higher and pebbly ground rising to the talus slopes of the mountain flanks.

The area is drained by two major river systems: Pishin Lora and Kadnai. The relief and water partings are distinct. Taking these as the criteria of delimitation, the Quetta-Pishin district has been divided into two major divisions : The Highlands (above 6,000 feet) and the Lowlands (below 6,000 feet).

The Highlands have been further sub-divided into : Tola Kahai, Khawaja Iman, Mashlakh Range, Chiltan, Kard and Zarghunes. The Tolas are again sub-divided into micro-divisions of Northern and Southern Tola. Northern Tola has, the valleys of Hesenas, Tashulat, Achlargai, while Southern Tola has the valleys of Takai, Madana, Tirwah and Tokarai. Khawaja Iman, Chiltan have also eastern and western sub-divisions. The Highlands have two divisions generally foothils (6,000-7,000 feet) and higher hills above 700 feet.

The Lowlands have sub-divisions of : Quetta, Aghlang, Bolai, Gamal, Kuilak, Barshore, shorawak, Tang, Shorakud and Daman-e-Chanan valleys. The Borshore has micro-divisions of : Surkhob, Maihka and Tang valleys. Each division is a district unit physically and even culturally.

RICE CULTIVATION IN BARURA THANA (COMILLA DISTRICT) EAST PAKISTAN

Tamjida Begum, Eden Girls' College, Dacca.

This is an intensive geographical study of a small area in Comilla District. Landuse pattern of the area shows that rice is the single dominant crop in Barura Thana. The current yield and acreage under rice is moved. A general description of the physiography and soil conditions of the area in relation to rice cultivation has been provided. Different land levels and soils have much to do with rice production in the area. Types of rice and different varieties produced in this area are observed.

The farming practices in the area have been studied and various stages of cultivation of the crop have been described. Small size of holdings, poor economic condition of growers and outmoded methods of cultivation are noted.

In conclusion, ways and means have been suggested to improve methods of cultivation on the one hand and on the other a more rational use of land in order to get the maximum advantage for the growers.

IRRIGATION DEVELOPMENT AND AGRICULTURAL OCCUPANCE IN THE UPPER INDUS VALLEY

Rashid A. Malik, University of the Panjab.

In the Upper Indus Valley, where rainfall is both insufficient and irregularly distributed, irrigation has been the vehicle of agricultural expansion from early times. Since 1859 nine irrigation projects have been completed in the study area, involving irrigation and colonization of twelve million acres of previously unproductive land. These projects are examplary of changing concepts and procedures in regional planning and development in dry areas. Associated with regional needs and technology, each of these changes have profoundly influenced the nature of subsequent agricultural occupance. The study differentiates the changes in pattern of agricultural land use and settlement really as they occurred over time as a result of irrigation expansion. Within this context, distinctions with respect to irrigation and occupance patterns have been drawn between areas that developed in the pre-British, British and post independence periods. Each period has been examined in detail, reviewing past experience in irrigation from the planning, organization and socio-economic viewpoints.

One World Divided: A Geographer Looks At The Modern World. Preston E. James. Blaisdell Publishing Co., New York, Toronto, London (1964); xi—482 pp.; maps, photographs, appendices, bibliography, index; $ 8.0.

The state of human affairs of our modern world has become extremely complex. Differences in the way of life of the people living in various parts of the world have become sharper; whereas the economic and political affairs of the nations can no longer be regarded as mutually exclusive. The problem is intriguing indeed. Any attempt at providing a meaningful perspective of the way this world is divided, the nature of interdepedence and the magnitude of social, economic and political problems faced by various nations must, therefore, merit attention of the scholars, politicians and the planners alike. The book under review presents one of such attempts. In this neatly produced valume scolarly insight, profoundity of thought and clarity of expression have been successfully combined to make this book extremely readable. In my opinion the *One World Divided* should be a required reading not only for the students of geogra phy but also for the students of world affairs.

Professor James has organized this book along the theme that "the significance to man of the physical features of the habitat is a function of the attitudes, objectives and technical skills of man himself." In his analysis of the problems in different countries the author follows an approach with the combined perspectives of geography and history—of position in space and stage in the sequence of events. The idea is, however, not entirely new. What is new and impressive about the book is the treatment. To understand the developments in various countries the author constructs geographic framework and divides the world into eleven cultural regions. They are: 1) the European culture region, 2) the Soviet culture region, 3) the Anglo-American culture region, 4) the Latin American culture region, 5) the North African-South-West Asian culture region, 6) the South Asian culture region, 7) the Southeast Asian culture region, 8) the East Asian culture region, 9) the African culture region, 10) the Australia-New Zealand culture region, and 11) the Pacific culture region. Each of these culture regions has been dealt seperately from chapters two to twelve. These regions have been, as the author himself puts it, "outlined by intuitive judgement based on a variety of sources and some direct field observations." In developing these culture regions, as has been discussed in chapter one, Profesor James advocates, and rightly so, that in order to undestand the present pattern of cultures it is necessary to recognize three periods which have introduced fundamental changes in the societal pattern and have revolutionzed the man's way of action and interaction with the features of his habitat. These periods signify Agricultural Revolution, development of Early Civilizations and Industrial and Democratic Revolutions. Country has been employed as basic unit for the purpose of demarcating the culture regions. These culture regions, certainly provide a more efficient framework for understanding the phenomenon of 'earth as a home of man' than those outlined by Kniffen in his *Culture Worlds* in which the culture regions have been poorly defined.

Each chapter on culture regions begins with a list of countries (with their respective political status, population and capital city) included in that region. For details each chapter has been divided into two parts. The first part provides a brief but meaningful introduction to the region in general, dealing with history, processes of change and habitat. The second part offers a discussion on the individual countries in terms of the character of its habitat, population, settlement pattern, social, political and economic organizations, concluding with some measure of the viability of the state. Although there exists some imbalance with regard to the content and space devoted to each region and the countries included therein yet the treatment in general is quite satisfactory and for the scope of a

volume like *One World Divided* such imbalances are inevitable. What seems to me inconsistent with the theme of this book is the phraseology borrowed from Herodotus regarding Egypt which has been quoted in chapter six, *i.e.*, "Egypt is a gift of Nile." I would like to change it to read as 'Nile is a gift to Egyptians'. In the last chapter the author concludeds his discussion and summarizes the significance of position in area, the pattern of population, the economic development and earth resources and the political attitudes of the people.

The book is profusely illustrated with appropriately designed maps and photographs. The appendices and bibliography are especially useful. In short the author successully presents and convincingly advocates his viewpoint.

IQTIDAR H. ZAIDI

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Sind—A General Introduction. H. T. Lambrick. Sindhi Adabi Board, Hyderabad (1964); 273 pp., maps, bibliography, notes, Index; Rs. 20.0

H. T. Lambrick is neither a geographer nor a historian, but a man of civil service with interest in the academics. Nevertheless, with the exception of few misconceptions of a technical nature, Lambrick displays a fund of geographical and historical knowledge of Sind. A short section of notes at the end of every chapter sufficiently establishes authority.

The book is first of the series planned by the Sindhi Adabi Board to produce a history of Sind in eight volumes, from prehistoric times up to the birth of Pakistan. The other volumes of the series under preparation are the Indus Civilization; the Arab Period; the Ghaznavi Period together with the Ghoris and their successors; the Arghun, Tarkhan, and the Moghul Periods; the Kalhoras and the Daudpota Period; the Talpur Period; and finally the British Period.

The author has served as Assistant Collector in various districts of Sind for about twenty years. His last assignment was that of a Superintendent of 1941 Census. During this time of service coupled with frequent travels, he acquired sufficient knowledge of the country and peoples of Sind. During his tenure in Sind and even afterwards Lambrick published a few books and wrote a number of articles for the *Journal of the Historical Society of Sind.* His two books entitled *Sir Charles Napier* and *John Jacob of Jacobabad* have earned recognition.

This background perhaps prompted the Sindhi Adabi Board to endorse a contract for writing this book to Lambrick. This may be worthwhile, but Lambrick's selection raises a fundamental question : Wansn't there any body in Sind equally competent to write a book about this land and its people ? The question becomes more pertinent when Sind has scholars like I. I. Kazi, Hisam-ud-din Rashdi, N. B. Baloch and many others. Lambrick states that knowledge acquired by him through his itinerant residence guided him to write this book. He was in Sind for about twenty yers during a foreign rule, with a foreign understanding, and a foreign interpretation of things. A proper undastanding of Sind's mature culture needed somebody who had a thorougher background and a deeper insight into the history of Sind.

The 228 pages of the text are organised in twelve chapters. 22-pages have been given to Appendix, and the remaining 30-pages to Index. Chapter II deals with the Eastern Desert, mainly its configuration and physics of blown sand. Most interesting section is where Lambrick advances a theory that monsoons were formerly stronger than what they are now. This may be of sufficient interest to our climatologists. The theory is based on an amorphous mass of soft sand piled upto a great height at latitude 26°30′, and between 69° and 70° longitudes. This mass of soft sand (known as *Drarens*) changes its shape with every noticeable breeze. North of *Drarens* the topography is of ridge and valley as is in the south. The term ridge and valley is used perhaps to denote longitudinal dunes which occur upon flat plains. These are thin straight sand ridges only a feet high but sometimes extends for many miles. These occur where sand supply is meagre but winds are fairly strong and persistent from one direction. Lambrick assumes,

the southern topography is the result of pesent monsoons and *Drarens* the limit where the monsoons loose transporting power and deposit the fine material. Since the topography north of *Drarens* is of longitudinal dunes the assumption is that it may have been created by the monsoons of the old times.

Several sections deserve merit. The chapter on Indus Civilization : Setting and Climate is very interesting. Also, the arguments partially contradicting the prevalent notions of a humid climate during the Indus Valley Civilization time are new and enlightening.

Chapter III deals with the plains of Sind and the River Indus. There is some interesting and valuable material in this section except where Lambrick tries to define things. Lambrick's definition of Indus Delta embraces whole of the Sind Plains in the sense that a large superanuated delta and one or more samaller active deltas coexist in Sind. This is something baffling. The Indus Delta is below Tatta, especially from the bifurcation points of Kalri and Pinyari and certainly no further.

Aside from technical misconceptions an other serious short coming was noted. The value of the works of the Mediaeval Arab Geographers is greatly underestimated. Lambrick complains of remarkable vagueness and inaccuracy in Arabic writings. Further, he has a very poor opinion of the Arab cartography. This is something contrary to facts, wholly indigestable, and expresses superficial understanding of the work of Arab Geographers.

The author has done a good job in producing fifteen maps which accompany the text. Though deficient in cartographic requirements, the maps are readable. With whatever shortcomings, the students of Sind should be grateful to the Sindhi Adabi Board and H. T. Lambrick for this book.

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