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STRUCTURE OF FARM HOLDINGS, POPULATION PRESSURE AND RESOURCE USE IN PAKISTAN'S AGRICULTURE

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I. INTRODUCTION

The structure of farm holdings in agricultural countries, like Pakistan, has an important bearing not only on the distribution of wealth and income in the rural countryside but also on the efficiency and patterns of resource use. Similarly, the population pressure as reflected in various land/man ratios may influence the intensity of resource use. This paper using data from the 1972 Agricultural Census examines the structure of farm holdings and its implications for resource use in Pakistan. It also analyses the population pressure on various farm size categories and its effect on the intensity of land use.

II. STRUCTURE OF FARM HOLDINGS

Data on the distribution of farms, and farm and cultivated acreage among various farm size categories in Pakistan are presented in Table 1. A perusal of this table indicates that the structure of farm holdings in the country is characterized by extremes and distribution of farm area among the total farms is highly skewed. On the one end are small farms operating less than 5 acres that account for 28 percent of the total farms but command only 5 percent of the farm area and about 6 percent of the cultivated area[1]. On the other end are the large farms, operating 50 acres or more, comprising of only 3 percent of the total farms but accounting for about 24 percent of the farm area and 18 percent of the cultivated acreage. It appears from the foregoing analysis that

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1. Cultivated area is that farm area which was sown at least once during the census year [4].

Table I: STRUCTURE OF FARM HOLDINGS IN PAKISTAN AND PROVINCES.1972

(Percentages)

Size of Farm	PAKISTAN				PUNJAB				SIND				N.W.F.P.				BALUCHISTAN			
	Farms	Asso-ciated house-hold.	Farm area	Culti-vated area.	Farms	Asso-ciated house-hold.	Farm area	Culti-vated area.	Farms	Asso-ciated house-hold.	Farm area	Culti-vated area.	Farms	Asso-ciated house-hold.	Farm area	Culti-vated area.	Farms	Asso-ciated house-hold.	Farm area	Culti-vated area.
Under 5 acres	28.2	26.8	5.2	5.8	16.1	24.4	4.8	5.2	19.1	18.6	4.5	5.1	55.3	53.9	12.7	15.5	24.0	23.7	2.2	2.9
5 to under 7.5 acres	15.4	14.9	6.9	7.8	15.2	14.5	7.1	7.5	17.3	17.2	8.0	9.1	14.4	14.3	9.2	11.1	12.3	12.2	2.8	3.5
7.5 to under 12.5 acres	24.5	24.0	18.2	20.5	23.8	23.2	18.9	34.3	34.1	26.5	29.7	14.1	14.1	14.1	14.4	17.1	19.5	19.4	7.7	10.1
12.5 to under 25 acres	21.1	21.7	26.6	29.0	23.1	23.9	28.8	30.3	22.0	22.3	29.2	30.8	9.4	9.8	16.9	19.5	20.7	20.6	14.7	20.7
25 to under 50 acres	7.7	8.8	18.8	19.0	8.8	10.3	21.3	21.1	5.1	5.5	13.2	12.2	4.0	4.3	14.3	15.5	13.2	13.4	17.4	22.5
50 to under 150 acres	2.7	3.3	15.1	12.9	2.7	3.4	14.7	13.3	2.0	1.8	10.7	7.9	2.3	2.9	18.9	15.1	8.0	8.2	23.6	22.3
150 acres and above	0.4	0.5	9.1	5.0	0.3	0.4	5.7	4.0	0.4	0.4	7.9	5.1	0.5	0.7	13.5	6.2	2.3	2.4	31.5	18.0

Source: Pakistan Census of Agriculture 1972.

the distribution of cultivated acreage among various farm size categories is relatively less skewed compared to that of the farm area. This is because of higher proportion of culturable waste land prevailing on large farms compared to that on small farms.

If we accept 12.5 acres as the limit for subsistence holdings, 68 percent of the total farms in the country are below subsistence level. These below subsistence units command 18 percent of the farm area and 34 percent of the cultivated area and about 66 percent of the total farm households are dependent on this area for their livelihood. However, the middle class of farms operating 12.5 to below 50 acres, constituting 29 percent of the total farms, command about 45 percent of farm and 48 percent of the cultivated acreage.

The pattern of distribution of farm area among farm holdings in the Punjab and Sind is more or less identical with that prevalent in the country as a whole. Of course, there are some minor differences in the individual size categories. Farms below 12.5 acres constitute 65 percent of the total farms and provide sustenance to about 62 percent of the total farm households in the Punjab. These farms account for about 30 percent of farm area and 32 percent of the cultivated acreage in the Punjab as compared to 39 percent of the farm area and 44 percent of the cultivated acreage in Sind where they comprise of about 71 percent of the total farms and are managed by about 70 percent of the total farming households. About 3 percent of the total farms in the Punjab having an area of 50 acres or more per farm command 20 percent of the farm area and 17 percent of the cultivated acreage. However, such farms in Sind constitute a little over 2 percent of the total farms and comprise of 19 percent of the farm and 13 percent of the cultivated acreage, respectively.

In N.W.F.P. farms below 12.5 acres, constitute a much higher percentage of the total farms and also account for relatively higher proportion of farm and cultivated area as compared to other provinces. Here they comprise of about 84 percent of the total farms, account for about 36 percent of the farm area and approximately 44 percent of the cultivated acreage and about 82 percent of the farming household are dependent on them for their living. In Baluchistan such farms account for 56 percent, 13 percent and 17 percent of the farms, farm area and cultivated area, respectively and provide means of livelihood to 55 percent of the farm households. In Baluchistan 10 percent of the total farms (50 acres and above) account for more than 55 percent of the farm area and a little over 40 percent of the cultivated acreage, whereas in N.W.F.P. about 3 percent of the farms belong to this category and operate 32 percent of the farm area and 21 percent of the cultivated acreage in the province.

In the light of our analysis it is obvious that structure of land holdings in Pakistan and her provinces is characterized by substantial inequalities in the distribution of farm area among various farm size categories.

III. FARM SIZE AND POPULATION PRESSURE

According to the Planning Commission's estimates about 73 percent of the country's population lives in rural areas [6]. This rural population is directly or indirectly dependent on agriculture for its livelihood. In spite of the increasing exodus of population from the rural countryside into the urban centers, both within and outside the country, the absolute number of people dependent or engaged in

agriculture and supporting industries and services is increasing. As a consequence of rapid population growth, the pressure on agricultural land is increasing while the supplies of farm land are either shrinking or not increasing enough due to competing claims from the non-agricultural uses on farm land such as housing urbanization and industrialization. Moreover, the menaces of waterlogging, salinity and soil erosion are not only depleting the fertility and crop-raising capacity of the soil but also endangering many, formerly, prosperous agricultural communities. As a result of all these factors, the per capita availability of farm land is declining and thus severely hampering the efforts aimed at increasing agricultural production and improving the living standards of those dependent on agriculture. Therefore, even to maintain the status quo in terms of per capita availability of farm products, the productivity of farm resources must rise.

The average size of householdsand the size of cultivated area on various farm size categories is presented in Table 2. It may be noticed from this table, that the average size of households, in general, increases as the farm size increases. However, it is obvious that the rate of increase in the size of households is much below than that of cultivated acreage in various farm size categories which should indicate that the pressure on cultivated land tends to decline with the increase in farm size. Different types of land/man ratios, generally, used to indicate the intensity of population pressure on land are given in Table 3. According to these figures, the upper limit on the physical availability of land per head in 1972 was about 1.86 acres on the basis of farm household members. The cultivated area available per household member is less than that of crop area. However,

Table 2: AVERAGE SIZE OF FARM & ASSOCIATED HOUSEHOLDS 1972

Size of Farm	PAKISTAN		PUNJAB		SIND		N.W.F.P.		BALUCHISTAN	
	Average Size of		Average Size of		Average Size of		Average Size of		Average Size of	
	Farm (cultivated acres)	House-hold.	Farm (cultivated acres)	House-hold.	Farm (cultivated acres)	House-hold.	Farm (cultivated acres)	House-hold.	Farm (cultivated acres)	House-hold.
Under 5.0 acres	2.2	5.8	2.3	5.7	2.9	5.6	1.7	6.1	1.5	6.6
5 to under 7.5 acres	5.5	6.2	5.7	6.1	5.6	6.0	4.6	7.1	3.7	6.9
7.5 to under 12.5 acres	9.0	6.5	9.3	6.4	9.3	6.3	7.3	7.5	6.6	7.0
12.5 to under 25.0 acres	14.8	7.1	15.2	7.0	14.9	7.1	12.4	8.1	12.6	7.7
25 to under 50 acres	26.8	7.7	27.8	7.5	25.4	8.6	23.6	8.1	21.7	8.4
50 to under 150 acres	51.1	8.3	57.1	7.9	47.4	9.7	39.6	7.6	35.3	9.6
150 acres and above	128.0	9.4	153.3	8.8	142.1	10.3	80.5	7.4	98.6	11.5

Source: Calculated from Pakistan Census of Agricultural 1972.

this is not true for all farm size categories. On farms of upto 50.0 acres the crop area available per household member is greater than that of cultivated area but on farms greater than 50 acres the cultivated area per household member is greater than the crop area. This indicates that cropping intensity is greater than 100 percent on farms of upto 50 acres and less than 100 percent on farms commanding, on the average, more than 50 acres. We shall return to the discussion of land use intensities in the next section.

Notwithstanding vast differences in the quality of land there are important regional differences in the physical availability of per capita land as the population and resource distribution are not uniform in various regions. The situation of low land/man ratio further worsens if one takes into consideration the wide disparities in the distribution and ownership patterns of land resources in the country. From the available statistics the population pressure on land appears to be more acute in the N.W.F.P. as only 1.29 acres of farm land was available per household member as compared to 1.84 in Punjab, 1.90 in Sind and 3.25 in Baluchistan in 1972. Similarly, availability of cultivated area per farm household member in N.W.F.P. was much less than that of other provinces, i.e. 0.85 as compared to around 1.61 to 1.65 acres in other provinces of the country. However, in each province there is a wide range in the availability of farm and cultivated area per farm household member. One feature which is common in all the four provinces is that per head availability of both farm and cultivated area increases with the increase in farm size. The available evidence, presented in Table 3, strongly suggests that population pressure on agricultural land is inversely related to farm size.

Table 3: POPULATION PRESSURE ON FARMS IN PAKISTAN AND PROVINCES BY FARM SIZE 1972.

Size of Farm	PAKISTAN			PUNJAB			SIND			N.W.F.P.			BALUCHISTAN		
	Area Per Household Member			Area Per Household Member			Area Per Household Member			Area Per Household Member			Area Per Household Member		
	Farm acres	Cultivated acres	Crop acres	Farm acres	Cultivated acres	Crop acres	Farm acres	Cultivated acres	Crop acres	Farm acres	Cultivated acres	Crop acres	Farm acres	Cultivated acres	Crop acres
Under 5.0 acres	0.41	0.38	0.50	0.42	0.40	0.52	0.53	0.52	0.74	0.34	0.27	0.40	0.31	0.23	0.20
5.0 to under 7.5 acres	0.92	0.86	1.07	0.94	0.90	1.09	0.97	0.93	1.31	0.79	0.63	0.83	0.85	0.52	0.42
7.5 to under 12.5 acres	1.42	1.33	1.57	1.41	1.36	1.58	1.52	1.45	1.83	1.18	0.93	1.10	1.38	0.92	0.74
12.5 to under 25 acres	2.10	1.90	2.10	2.06	1.92	2.14	2.28	2.03	2.35	2.54	1.43	1.50	2.26	1.62	1.32
25 to under 50 acres	3.38	2.84	2.93	3.32	2.93	3.13	3.41	2.67	2.79	3.55	2.55	2.31	3.79	2.49	1.76
50 to under 150 acres	6.37	4.76	4.63	6.48	5.23	5.46	6.79	4.26	3.97	7.52	3.97	3.06	7.32	3.54	2.31
150 acres and above	24.10	11.13	9.79	22.67	13.86	14.18	22.86	12.38	10.77	22.35	6.71	5.03	28.20	8.15	4.52
All Farms	1.86	1.53	1.70	1.84	1.64	1.84	1.90	1.61	1.90	1.29	0.85	0.93	3.25	1.65	1.17

Source: Calculated from Pakistan Census of Agriculture 1972.

Moreover, there is considerable gap in the per capita availability of farm and cultivated area and this gap increases with the increase in farm size. In the lower farm size groups the gap is only nominal but on farms of 50 acres and above the gap reaches serious proportions. There are some other interesting features which emerge from this analysis as well. The availability of agricultural workers (family and permanent hired) and work animals per cultivated acre is the highest on farms of lowest size group and is about one and 0.4 per cultivated acres, respectively, (Table 4). But there is a very rapid decline in the availability of manual as well as bullock labour per cultivated acre as the farm size increaseswith the result that there is one worker for 16 acres of cultivated area and only one work animal per 32 acres on farms of 150 acres and above. These figures tend to portray an inverse relationship between farm size and the availability of farm workers and work animals per unit of farm land. The lower availability of workers and work animals might partly explain why there is a greater concentration of farm tractors on large farms. Eighty-six percent of the total tractors were owned by farmers owning more than 25 acres of farm land [5]. Despite this substitution of farm machines for the traditional sources of power on the large farms the availability of draft power per acre remains quite low. This may partly explain lower levels of cropping intensities obtaining on these farms. Factors affecting cropping intensities are discussed in the next section.

Table 4: AVAILABILITY OF FARM LABOUR AND WORK ANIMALS BY FARM SIZE 1972

Size of Farm	PAKISTAN		PUNJAB		SIND		N.W.F.P.		BALUCHISTAN	
	Number of workers per cultivated acre	Work animals per cultivated acre	Number of workers per cultivated acre	Work animals per cultivated acre	Number of workers per cultivated acre	Work animals per cultivated acre	Number of workers per cultivated acre	Work animals per cultivated acre	Number of workers per cultivated acre	Work animals per cultivated acre
Under 5.0 acres	0.93	0.40	0.99	0.40	0.79	0.44	1.18	0.38	2.16	0.48
5.0 to under 7.5 acres	0.46	0.29	0.48	0.29	0.47	0.31	0.58	0.29	0.94	0.30
7.5 to under 12.5 acres	0.32	0.21	0.34	0.21	0.30	0.20	0.40	0.22	0.52	0.21
12.5 to under 25 acres	0.23	0.15	0.26	0.15	0.22	0.14	0.28	0.15	0.29	0.13
25 to under 50 acres	0.15	0.09	0.18	0.09	0.17	0.11	0.17	0.08	0.21	0.09
50 to under 150 acres	0.08	0.05	0.11	0.05	0.11	0.07	0.11	0.05	0.14	0.07
150 acres and above	0.03	0.03	0.06	0.03	0.05	0.04	0.08	0.04	0.07	0.04
All Farms	0.24	0.16	0.28	0.15	0.27	0.18	0.48	0.18	0.30	0.12

Source: Calculated from Pakistan Census of Agriculture 1972.

IV. RESOURCE USE AND FARM SIZE

Intensities of land use and cropping[2] are two important indicators, generally, used to analyse the extent of land utilization and other farm resources.

The availability of irrigation water affects land utilization to a large extent. However, other factors such as population pressure, adequacy of draft power, management practices and the types of crops grown also exert considerable influence on the patterns and extent of land use among different farms and regions. Intensities of land use and cropping obtaining in 1960 and 1972 in Pakistan, arranged according to farm size, are presented in Table 5. The data on cropping intensities prevailing in various provinces are provided in Table 6.

It is observed from the tabulated data that both the intensities of land use and cropping are higher on lower categories of farms. However, culturable waste land (indicating the possibilities for increasing land use intensity) increases with the increase in farm size. The culturable waste land on farms below 12.5 acres is less than 4 percent of the farm area. It increases rapidly with the increase in farm size with the result that over 18 percent of the farm area is culturable waste on farms of 50-150 acres and 30 percent of the farm area constitutes culturable waste land on farms of over 150 acres. As the adequate supplies of irrigation water are one of the most important means for increasing land use intensity and reducing culturable waste area, it may be of interest to analyse how the irrigated acreage varies with the farm size. The percentage of cultivated irrigated area is relatively

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2. I) Land Use Intensity = $\frac{\text{Cultivated Area}}{\text{Total Area}} \times 100$

II) Cropping Intensity = $\frac{\text{Total Cropped Area}}{\text{Cultivated Area}} \times 100$

TABLE 5: CULTURABLE WASTE, LAND USE INTENSITY AND CROPPING INTENSITY .

Farm Size	1972			1960		
	Culturable waste as a percentage of farm area	Land use intensity	Cropping intensity	Culturable waste as a percentage of farm area	Land use intensity	Cropping intensity
	(Percentages)					
Below 5 acres	3	92	133	8	86	116
5 to under 7.5 acres	3	93	126	7	88	115
7.5 to under 12.5 acres	4	93	119	8	88	111
12.5 to under 25.0 acres	6	90	111	10	85	106
25.0 to under 50.0 acres	10	84	103	16	78	98
50 to under 150 acres	18	71	97	31	59	85
150 and above	27	46	88	49	35	57
All Farms	10	83	111	16	76	103

Sources: 1) Calculated from Pakistan Census of Agriculture 1972.

2) Calculated from Pakistan Census of Agriculture 1960 Vol. II.

Table 5: INTENSITIES OF LAND USE BY FARM SIZE IN VARIOUS PROVINCES OF PAKISTAN 1972.

Size of Farm	PUNJAB			SIND			N.W.F.P.			BALUCHISTAN		
	Culturable waste as percentage of farm area.	Intensity of land use.	Cropping intensity	Culturable waste as percentage of farm area.	Intensity of land use.	Cropping intensity	Culturable waste as percentage of farm area.	Intensity of land use.	Cropping intensity	Culturable waste as percentage of farm area.	Intensity of land use.	Cropping intensity.
Under 5 acres	2.2	95.7	127.7	3.0	96.8	143.6	3.5	80.4	146.0	5.2	66.5	86.3
5 to under 7.5 acres	2.2	96.3	120.8	3.4	96.4	140.9	4.3	79.5	132.0	8.2	63.6	80.0
7.5 to under 12.5 acres	2.5	95.9	116.8	4.6	95.2	126.2	4.8	78.7	119.3	11.6	66.7	79.8
12.5 to under 25 acres	4.2	98.7	110.6	10.4	89.0	116.0	7.9	75.8	105.4	11.0	71.4	81.7
25 to under 50 acres	7.1	88.7	106.8	20.6	78.5	104.2	16.1	71.7	90.7	11.3	65.8	70.7
50 to under 150 acres	11.1	80.7	104.4	35.8	62.2	93.3	37.1	52.7	77.1	18.6	48.3	65.4
150 acres and above	18.6	61.6	102.3	44.1	54.2	86.0	52.1	30.0	75.0	23.6	29.0	55.2
All farms	6.1	89.2	11.7	14.7	84.6	118.0	19.3	66.0	108.6	17.0	51.0	71.0

Source: Calculated from Pakistan Census of Agriculture 1972.

higher on small farms which may partly explain higher land use and cropping intensities on these farms (Table 7). Nevertheless, these differences cannot tell the whole story as the differences in land use intensities of small farms and the larger ones are much more pronounced than those obtaining in the proportion of irrigated area.

The extensive use of land on large holdings may be one of the factors hampering the cause of agricultural development in the country. It may also be argued that large farmers are interested in large holdings and land ownership, primarily, for prestige, speculation or as a hedge against inflation and only secondarily as a source of income from farm production. Under such circumstances the value placed by the farmer/owner on the land for agricultural production is low relative to the cost of capital and labour which encourages less intensive use of land /12/. Relatively lower population pressure, and availability of fewer workers and work animals on large farms, as previously discussed, also tends to support this argument. It must be recognized that a substantial proportion of farm land on large farms is culturable waste which could be brought under cultivation but has not been done so far. Besides lack of irrigation facilities, this high incidence of culturable waste land may also be due to shortages of manpower and draft power on large farms. As discussed in the preceding section, the number of work animals available per acre steeply declines with the increase in farm size. It has been estimated that on farms below 5 acres the average number of work animals per farm acre was 0.37 as compared to only 0.02 on farms of 150 acres and above. Though these differences do not necessarily reflect the differences in the availability of actual

TABLE 7: PERCENTAGES OF CULTIVATED AND CROP AREA AFFECTED BY IRRIGATION 1972

Farm Size Categories	PAKISTAN		PUNJAB		SIND		N.W.F.P.		BALUCHISTAN	
	Percentage of Irrigated.		Percentage of Irrigated.		Percentage of Irrigated.		Percentage of Irrigated.		Percentage of Irrigated.	
	Cultivated area	Crop area	Cultivated area	Crop area	Cultivated area	Crop area	Cultivated area	Crop area	Cultivated area	Crop area
Under 5.0 acres	75	74	76	74	96	79	54	59	50	66
5.0 to under 7.5 acres	73	77	79	81	94	76	51	57	39	52
7.5 to under 12.5 acres	81	80	79	82	95	82	45	52	44	58
12.5 to under 25.0 acres	79	81	78	82	91	84	42	49	55	70
25.0 to under 50.0 acres	70	76	72	76	84	86	39	46	45	64
50.0 to under 150.0 acres	60	68	62	68	77	87	41	50	32	49
150 acres and above	61	72	70	74	78	93	48	55	23	42

Source: Calculated from Pakistan Census of Agriculture 1972.

draft power as large farms have greater proportion of tractors nevertheless, the draft power availability per acre on small farms is known to be higher.

The cropping intensities on different farm categories range from 133-obtaining on the lowest farm size category to 88-prevailing on the highest farm size category. Despite an increase in the percentage of irrigated cultivated area and irrigated cropped area on farms upto 12.5 acres and 25 acres, the cropping intensity is highest on the lowest category of farms and declines with an increase in farm size. A similar pattern in cropping intensities, i.e. higher cropping intensity on the small farm is observed in all the four provinces of Pakistan and this supports the hypothesis of inverse relationship between cropping intensity and the farm size. On the whole, land use intensity is relatively higher in the Punjab (89 percent) and the lowest in Baluchistan (51 percent). While cropping intensity in Sind is the highest of all. Contrary to Burki's assertion that cropping intensity in Sind is considerably lower than in the intensive irrigated areas of the Punjab and Frontier Province [17], the cropping intensity in Sind is much higher, i.e. 118, as compared to that of Punjab and N.W.F.P. being 111.7 and 108.6 percent, respectively.

We have attempted to analyse the factors affecting cropping intensities and results of regression analysis are presented below:

$$Y = 56.658 - 2.226\ X_1 + 7.727\ X_2 + 0.749\ X_4 + 0.630\ X_5$$

t-values (-1.991) (0.869) (4.644) (0.282)

$R^2 = 0.5998$ $F = 8.617$ $N = 28$

t-values (-0.777) (2.269) (4.228) (0.325)

$R^2 = 0.6622$, $F = 11.273$ $N = 28$

where Y = Cropping intensity,

X_1 = Cultivated area per household member,

X_2 = No. of workers per cultivated acre,

X_3 = No. of work animals per cultivated acre,

X_4 = Percentage of cultivated area irrigated, and

X_5 = No. of tube-wells per 1000 acres of cultivated area.

The results of our analysis indicate inverse relationship between cropping intensity and per head availability of cultivated area. This explains that as the population pressure, which is much higher on small farms, decreases, other factors remaining constant, the cropping intensity will decline and vice versa. A similar impact of population pressure is observed on the land use intensity. Besides irrigation the availability of work animals had positive influence on increasing cropping intensities.

Population pressure on land, availability of work animals and the proportion of cultivated area irrigated together explain about 66 percent of the variation in cropping intensities on different farm size categories. Similarly, the population pressure, availability of work animals and tube-wells explain about 75 percent of the variation in the land use intensities of different farm size groups.

Land use intensity = 70.019 - 1.426 farm area per household member
+(t=5.185),

+41.808 work animals per acre + 4.150 Tube-well per thousand
(t=2.213) (t=3.581) farm acres.

R^2 = 0.7518, F = 31.3116, N = 35

It may be emphasized that because of the aggregated nature of data the direction of relationship rather than the precision of the estimated coefficients is more important and meaningful and hence requires

caution in the interpretation of the estimated results.

Comparative analysis of land utilization statistics of 1972 and 1960, presented in Table 5, indicates that the proportion of cultural waste land has in the intervening years declined from 16 to 10 percent of the farm area. Moreover, the overall land use intensity has increased from 76 percent to 83 percent while cropping intensity from 103 to 111 percent in the intervening period. The results of this analysis further reveal that the culturable waste land, for every farm size category, declined but both land use and cropping intensities increased in the period under consideration. The available evidence supports the argument of the increases in land use and cropping intensities over time. It may be mentioned here that during the intervening years there has been substantial investments in various schemes of irrigation and farm mechanization which has been helpful in reducing the culturable waste land and thus increasing land use intensity. Moreover, the introduction and rapid spread of high-yielding seeds and the increased supplies of irrigation water, fertilizers, and tractors have provided opportunities for practising intensive agriculture. It is argued that all these factors have been helpful in increasing cropping intensities in the intervening period.

V. LIMITATIONS OF ANALYSIS

Because of the highly aggregated nature of the data our findings might have incorporated some of the biases of the dominating regions for various provinces. To that extent these findings may be at variance with those of prevailing in specific agro-climatic zones and can be better ascertained through an analysis of the disaggregated data. Nevertheless,

the results of our analysis do represent the average characteristics of the farming situation prevailing at the national and regional levels.

VI. CONCLUDING OBSERVATIONS

The prevailing structure of farm holdings in Pakistan and her provinces indicates a paradox, i.e. the small farms (upto 12.5 acres) that are in an absolute majority operate a very small fraction of the farm area while on the other hand there is a small fraction of the so-called large farms (over 50 acres) that command substantial proportion of the operated farm area. The population pressure on farm resources, the available evidence suggests, varies inversely with the farm size. This pressure is extremely severe on farms of below 5 acres as the availability of farm area per household member on such farms is less than half an acre and that of crop area slightly higher; whereas on farms of 150 acres and above the availability of the farm area, cultivated and cropped area per household member is about 24, 11 and 10 acres respectively. On small farms the availability of crop area per household member is greater than that of farm and cultivated area but the opposite is true for the large farms. This suggests an inefficient use of the scarce land resources in the country on large farms where it is available in relative abundance. The proportion of culturable waste land also increases with the size of farm whereas the intensities of land use and cropping vary inversely with farm size. Tremendous population pressure on small farms, apparently, obliges their operators to make an intensive use of scarce land resources in order to eke out minimum standard of living for the dependent household members. Conversely, the large holdings with abundant supply of farm land per household member and

relatively smaller supplies of farm hands use their land resources in an inefficient and wasteful manner.

The opportunities for bringing virgin lands under plough are limited in the short run and very expensive in long run. Moreover, the inelastic supplies of farm land are facing severe competition from the non-agricultural uses such as housing, recreation and industrial development. In the face of this and ever increasing population of the country and her requirement of food and fibre, the wide differences prevailing in the intensities of land use and cropping among the small and large farms and the widening of this gap with the increase in farm size should be a matter of special concern to all those entrusted with the responsibilities of agricultural and rural development.

The heart of the agricultural and rural development problems in Pakistan lies in creating conditions for increased farm productivity and full employment of the scarce land and water and abundant manpower resources. Evidence available strongly indicates that the intensities of land use and cropping vary inversely with farm size in all four provinces of Pakistan. Whatever may be the reason, the use of land resources on large farms is inefficient and wasteful. Under similar patterns of land use, in India, Sau [7] observed that the clue to the solution of poverty and unemployment in India could be found once we accepted this glaring fact that large farmers were not using the land in the best possible way. The recognition of the same fact might provide the key to the problems of poverty and squalor in Pakistan as well.

It may be emphasized here that for sustained agricultural development in all provinces of the country the small farms (below 12.5 acres), that are in absolute majority all over the country, must participate and be involved in the implementation of various agricultural development programmes otherwise the development of agriculture will remain an elusive goal. Farm productivity on small farms must increase for which they must have adequate access to improved technology, modern factor inputs, institutional credit and extension services. However, the farms ranging from 12.5 to 50 acres, due to their resourcefulness, capacity to take initiative and innovate will have to spearhead the agricultural transformation in the country in future.

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