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Small Farms and the Current Structure of Farmland Holdings in Pakistan

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Abstract

In agrarian economies like Pakistan, agriculture structures especially, the pattern of ownership of land and size distribution are the crucial indicator and principal form of wealth and political power. Despite two land reforms (1959, 1972), to reform the feudal agrarian structure of the country, agricultural lands are highly skewed in favor of large farms. This dominance of large farms in owning means of production leads to severe inequalities in the distribution of wealth and income which is the major obstacle in the provision of the basic need to a large proportion of the population. Tenancy, a problem in the past because poor tenants were handicapped in accessing different institutes and services, is solved somehow. Despite different consolidation programs in the past, the fragmentation issue is there, 34 percent of total farm area is fragmented in Pakistan. A majority of farms (58%) in Pakistan are small farms, so for the prosperity of the country, well-being of small farms is very important. Due to the diversification of agriculture from cash crop to high-value commodities, and concepts like tunnel farming, organic agriculture, horticulture and livestock, small farms tend to offer some opportunities. On the other hand, natural disasters, pest attacks, access to financial markets, unfavorable macroeconomic policies are threatening the prosperity of small farms.

Key Words: Land Holdings, Small Farms, Family Farms, High Value Commodities, Pakistan

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1 Introduction

Agriculture holds a prime importance in economies of many developing countries, so is true for Pakistan. Almost 61% population of Pakistan lives in rural areas, which makes agriculture more important for the country as it is the mainstay of the largest proportion of the population. Agriculture contributes almost 19 percent to the GDP and 38.5% labor force is employed by agriculture sector. The share of agriculture in GDP has declined continuously from 47.7% in 1960's to 20.2% in 2010 to 18.9% in 2018 to 19% in 2020 (MOF, 2020). Not very different but similar trend has been seen over the years in the growth of agriculture sector (Ahmad et al. 2003). Declining trend has been seen in the growth of agriculture sector and share of agriculture in GDP has many future implications. Declining growth in agriculture can be attributed to many factors, such as, small farm size, lack of modern technology, water shortage, natural calamities, and declining land productivity.

In order to solve the problem of landlessness and disparities in landholding two land reforms in 1959 and 1972 were carried out to reform the feudal land tenure system inherited by Pakistan. The land reforms were basically conducted to serve three purposes: increased production, efficiency, and equity through redistribution of land and security of tenure. However, these reforms failed to change the status quo in Pakistan and thus had no considerable impact on production (Naqvi et al., 1989). Similarly, these reforms were not successful in increasing cultivated area of the country except slight increase seen in the early 1970s. However, they seem to induce large farms into small, small farm area has increased and tenancy ratio to ownership has reduced to some extent (Khan et al., 2011).

The land is the most important factor among three basic factors of production (land, labor, capital) in agriculture. In developing countries like Pakistan, the ownership of the land is a very important indicator of the well-being of the rural household. It can be pointed out that the basic characteristic of farm is operation not ownership as definition of a farm is "as the aggregate land area operated by one household member(s) alone or with the assistance of other household member(s) without regard to size, title or location, and used normally for the agricultural production. On the other hand, the structure of land

holding and tenure arrangements under which farm is being operated exert a significant impact on the patterns of resource use, income distribution, and technology transfer. In the same way, organization and efficiency of farm resource use and capital investment on the farm may be affected by fragmentation of holdings (Din & Salam, 1980). The skewed distribution of land ownership, if not solely, but mainly leads to unequal income distribution and social power (Khan & Mahmood, 2006; Hamid and Maliha, 2008). Several economic problems stem basically from incapability of agriculture sector with unequal land distribution to provide full time employment opportunities and its resulting failure to provide with enough income, which can ensure a satisfactory standard of living to the rural people of the country (Chaudhry, 1994; Khan & Mahmood, 2006). This study aimed to analyze current structure of land holding in Pakistan (land ownership, tenure arrangements, and land fragments) and discuss importance of small farms are for agriculture of Pakistan.

2 Methodology

The Agricultural Census of 2010 provides baseline source of information for this study. Degree and direction of changes in ownership were measure and trends in tenurial patterns were analyzed. The scale of sub-division and fragmentation of farm area and landholdings were measured. The farm was categorized into four group, small farms (landholding less than 5 acres), medium farms (landholding between 5-12.5 acres), Large farms (landholding 12.5 to 25 Acres), and very large Farms with a landholding above 25 acres. Lorenz curve Technique used to examine the degree of inequality in the land distribution. Lorenz curve depicts the relationship between a total number of farms and farm area. Finally, small farms which are large in numbers in the country their importance for agriculture and challenges faced were discussed

2.1 Empirical Model

In this study farms were categorized into four groups based on the (GOP, 2019): small farms with land holding less than five acres; medium farms with land holding between five to 25 acres; larger farms with land holding above 25 acres.

Following past research studies (Jayne et al., 2003; Ahmad et al., 2003; Qureshi et al., 2004), Lorenz curve was used to analyze the overtime structural changes in the land distribution in Pakistan. The Lorenz curve is a way of showing distribution of something (land here) (Theil, 1976). Lorenz curve portrays the relationship between total farm area and number of farms (Chaudhary et al., 1980). The Lorenz curve and Gini coefficient are represented by the following equation (Edwards, 1980; Chatta and Singh, 1992):

$$Lorenz\ Curve = 1 - \sum_{i=1}^{n} \frac{(X_i - X_{i-1})(Y_i - Yi_1)}{10{,}000}$$

Where, xi = percentage frequency of number of farms (Xi = 1, 2, 3, …, n), Yi= cumulative percentage frequency with respect to farm area corresponding to size of class (Yi = 1, 2, 3, …, n).

Lorenzo curve shows the actual relationship between number of farms and farm area. The more away the Lorenz curve from the diagonal line the greater is the degree of inequality.

3 Results and Discussion

3.1 Structure of Landholding

Highly separated and irregular land structures; relationship between ownership and means of production, especially capital and land exist in agriculture structure of Pakistan. The agrarian groups in the country are classified into five main categories. Firstly, there are landlords, prominent in Sindh province who own large number of land areas. Generally, they rent out larger proportion of their land to sharecropper who are landless; due to lack of the resources and work opportunities tenants are forced to agree with the terms of landlords. In determining landlords-tenants relationship land, as a primal traditional factor plays a center role. Owner-operator farms are second category, most of the land is owned by these farms; they cultivate themselves as well as rent in land to cultivate more from others. One other category is middle peasants also called family farmers. They own and rent in land for cultivation and wholly depends on their family production neither seek help from others to take part in their production activities. The fourth category is of 'Haris' sharecropper prominent in Sindh. These poor marginal peasants rent in land to cultivate and share output with the landlords. This is the very important component of feudal system which at times

works for the landowners to supplement their income level. Wageworkers are the final class of these categories. Landless households who used to work on wages for the rich landlords belongs to this class. They work as a seasonal or permanently hired labor and may be compensated with cash or kind.

The land holding structure in Pakistan changed overtime interestingly. The landowners share having over 100 acres of land is declined in terms of both number and farm size but still they own large share of cultivated area. At the same time the area owned by other farmers categories has increased to some extent. For instance, landowners share having less than five acres during the period of 1960s has increased from 5% in 1972 to nine % in the 1980s and to 11% in year 2000 (Khan et al. 2011).

Table 1
Province-Wise Distribution of Number of Farm and Farm Area.

Administrative unit	Number of farms		Farm Area	Average size (in acres)		
	No. (millions)	% of total of farms	Total farm area (million acres)	% of total farm area	Average Farm area (acre)	Average cultivated area (acre)
Pakistan	8.26	100%	52.91	100%	6.4	5.2
Punjab	5.25	64%	29.33	55%	5.6	5.1
Sindh	1.11	13%	9.87	19%	8.8	6.9
Khyber Pakhtunkhwa	1.54	19%	5.57	11%	3.6	2.9
Baluchistan	0.36	4%	8.14	15%	22.7	9.7

Source: Agricultural Census, 2010

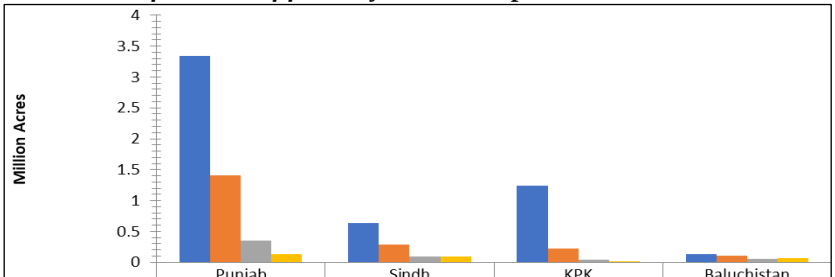
According to the census of agricultural 2010, there are total 8.26 million farms operated in the country. These farms are operating in an area of 52.91 million acres, with 42.62 million acres of cultivated area and 10.28 million acres of uncultivated area. Punjab has the biggest share in the number of total farms with 5.25 million followed by Khyber Pakhtunkhwa 1.54, and Sindh and Baluchistan 1.11 and 0.36 million acres respectively. The average farm size in the country was 6.4 acres whereas the cultivated area per farm was 5.2 acres (Table. 1.1).

3.2 Land Ownership

One of the important factors of agricultural productivity is distribution of ownership of land and this also affects well-being and social and political status of farmers in society. Land distribution in Pakistan is highly skewed like all other developing countries. Table 1.1 shows that the land holding structure in the country is characterized by the extremes and the distribution of the farm area (almost 53 million) among the total farms (8 million) is highly skewed. Small farmers operating less than 5 acres accounts 64 percent of the total farms, on the other hand, have to control on just 19 percent of farm area. Large farms operating more than 25 acres, comprises only 4 percent of the total number of farms but accounts for 34 percent of farm area. However, the share of the small land holders less than 5 acres, which they operated in 1960 have increased from 5 percent in 1970 to 9 percent in 1980, 11 percent in 2000 and 19 percent in 2010, while the number of small farms increased from 1960 to 1970 but showed a small declined from 64 percent in 2000 to 64 percent in 2010. The overall number of farms in small size category increased, on the other hand declining trend was observed among medium farm and large farm category (Paul & Mondal, 1994).

If we consider a 12.5 acre as a subsistence holding level, even then 89% percent of farms in the country are lower than this level of holding. These 89 percent of farms below subsistence level command 48 percent of the total area; on the other hand, the medium and large category comprising 7 and 4 percent of total farms hold 18 and 34 percent of total area respectively.

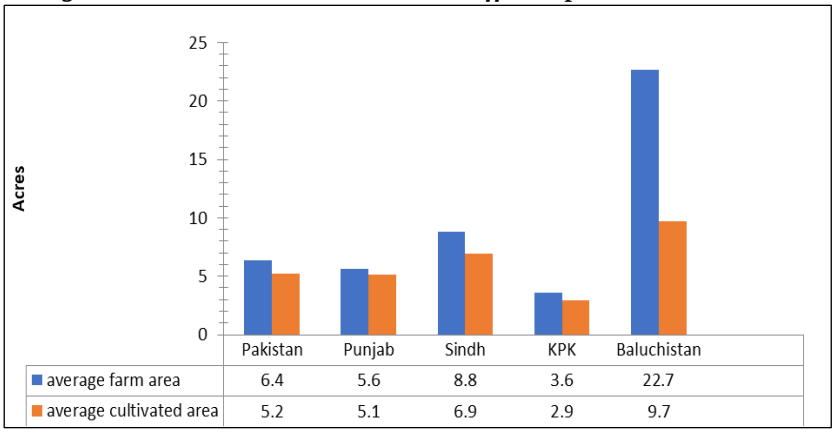
Figure 1
Distribution of number of farms by size across provinces



	Punjab	Sindh	KPK	Baluchistan
under 5 acre	3.34	0.63	1.24	0.13
5-under 12.5	1.41	0.29	0.22	0.11
12.5-under 25	0.35	0.09	0.04	0.05
>25	0.13	0.09	0.02	0.06

Numbers of farms operating less than 5 acres are very high in Punjab (3.34 million), followed by KPK (1.24 million), Sindh (0.63 million) and Baluchistan (0.13 million) (Fig.1.1). The average size of a farm in Punjab is approximately similar to Pakistan while Baluchistan has a very high average as compared to other provinces (Fig. 1.2).

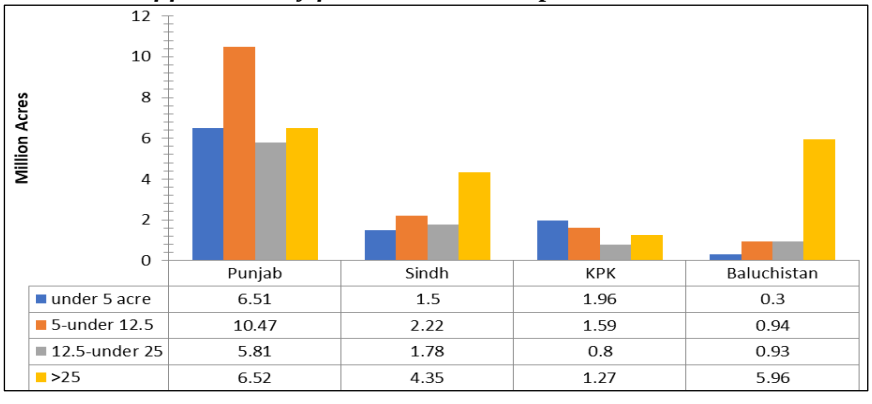
Figure 2
Average Farm area and cultivated area in different provinces



	Pakistan	Punjab	Sindh	KPK	Baluchistan
average farm area	6.4	5.6	8.8	3.6	22.7
average cultivated area	5.2	5.1	6.9	2.9	9.7

If we look at the distribution of farm area by farm size, in Punjab more acreage of land is in command of 5-under 12.5-acre category, in KPK, there is mixed distribution but with passage of time share of large farm is clearly declining in terms of both number and total area (Ahmad et al. 2003), in Sindh more is in hold of more than 25-acre category.

Figure 3
Distribution of farm area by farm size in various provinces



	Punjab	Sindh	KPK	Baluchistan
under 5 acre	6.51	1.5	1.96	0.3
5-under 12.5	10.47	2.22	1.59	0.94
12.5-under 25	5.81	1.78	0.8	0.93
>25	6.52	4.35	1.27	5.96

Distribution of farm area among different farm size category appeared to be more skewed in favor to large farms in Baluchistan (Fig.1.3).

3.3 Land Tenure

The rights under which land is operated and cost of production and produce are shared among the concerned parties are called land tenure. The real and only mean of participation in the political and economic life of the country for farmers is the land ownership or other secure forms of tenure which assure farmers of some control over returns from his labor and land he works. Moreover, it also has a significant influence on the use of the resource, adoption of technology and incentives. Therefore, it is very useful to know about various types of tenurial arrangements.

About 82 percent of total farms comprising 75 percent of total area are owner-operated farms. Between 1960-1972 tenants lost land area while owner-cum-tenants category acquire more area. During 1970-2010, both categories lost area, if both are aggregated then the percentage of tenant area is decreased from 39% in 1960 to 30% in 1972, 22 in 1980 and then decreased to 18 percent in year 2000 and 2010 (GOP, 2015). Owner operated farms exist as the largest group from 1960-2010 and owner farms increased during the entire period. Owner-cum tenant farm and tenant farms tend to decline over the period (Hines et al. 1994).

Table 2
Distribution of farms by tenure

	Owner operated farms (mln)	Owner-cum Tenant operated farms (millions)	No. of Tenant operated farms (mln)	Total (mln)	owner operated farms (%)	owner-cum tenant operated farms (%)	Tenant Operated Farms (%)	Total (%)
<5	4.57	0.22	0.56	5.35	86	4	10	100
5-12.5	1.55	0.23	0.26	2.04	76	11	13	100
12.5-25	0.39	0.09	0.07	0.55	71	17	12	100
>25	0.21	0.06	0.02	0.29	72	21	7	100
Total	6.72	0.60	0.91	8.23	82	7	11	100

Source: Agricultural Census, 2010

Table 3.
Distribution of Farms by Farm size and tenure

Operated area (acres)	Owner Operated farm area (million acres)	Owner-cum tenant operated f arm area (million acres)	Tenant operated Farm Area (million acres)	Total (million acres)	Owner operated farm area (%)	Owner-cum tenant operated farm area (%)	Tenant operated Farm Area (%)	Total (%)
<5	8.31	0.584	1.28	10.17	86	4	10	100
5-12.5	11.44	1.85	1.94	15.23	75	12	12	100
12.5-25	6.67	1.57	1.10	9.34	71	17	13	100
>25	12.98	3.57	1.56	18.11	72	20	8	100
Total	39.4	7.57	5.88	52.85	75	14	11	100

Source: Agricultural Census, 2010

From less than 5-acre farm category, 86 percent farms are operated by owners remaining 4 percent by owner-cum-tenant and 10 percent by the tenant. Collectively, tenant and owner-cum-tenant operate the higher number of total farms and farm area in 12.5- under 25 and more than 25-acre category. In Pakistan, almost 39.4-million-acre farm area is operated by owners and 13.4 million acres by owner-cum-tenants and tenants. Among provinces, in Punjab, 70 percent of the total area is operated by owners and remaining by tenant and owner-cum-tenants. Sindh and KPK show a similar figure with 78-79 percent operated by owners and left over by tenants and owner-cum-tenant. Baluchistan is the province with a high percentage of area operated by owners (82 percent) among all other provinces.

3.4 Land Fragmentation

Table 4.
Number and area of farm by size of farm

Operated (Acres)	Number of farms		Farm Area	
	Number of Farms (millions)	% of total farms	Total Farm Area (Million Acres)	% of total farm area
<5 acre	5.35	64	10.18	19
5-12.5 acre	2.05	25	15.24	29
12.5-25 acre	0.56	7	9.36	18
>25 acre	0.30	4	18.12	34
Total	8.26	100	52.91	100

Source: Agricultural Census, 2010

In many developing countries, agriculture holdings are small as well as fragmented due to severe population pressure on limited land resources. This may cause wastage of valuable agriculture land lots of litigation among the neighboring farm over the boundaries of tiny plots. Land fragmentation has also been considered as source of loss of productivity. It is stated that land fragmentation lowers productivity by raising transport cost between fields and preventing the realization of economies of scale (Khan & Qureshi, 1999). Fragmentation of farmland leads to ineffective use of resources and major hinder in the agricultural development (Mosher, 1996). Right of pre-emption or first refusal which family member enjoys on inherited land, transaction cost, extreme thinness of land market and fall in price of overall land when selling small parcel of land are some barriers restrict solving the fragmentation problem (Heston and Kumar, 1983).

Table 1.5 shows that 34 percent of total farms in Pakistan are fragmented, with highest number of farms reporting 2-3 fragments (25.42 percent). Under 5-acre farm category has very lowest percentage of fragmented farms, on the other hand, among the remaining three categories; more than 25-acre category has 75 percent of farmland fragmented, 12.5-under 25 acre has 62.8 percent of farms fragmented, and 5-under 12.5 reports almost 46.5 percent of farms with fragments. All four categories report more 2-3 fragments while the percentage of 4-5, 6-9 and >10 is low. Average numbers of fragments per farm were three, with more than 25 acres farm category having 4.6 fragments per farm. Almost 3 million acres of under 5-acre farm have fragments, while this ratio is very high for other categories (7.33 million acres of 5-under 12.5-acre farms, 5.9 million acres of 12.5- under 25 farms, and 13.87 million acres of >25-acre farms).

Table 5
Classification of different size of farm by number of fragments

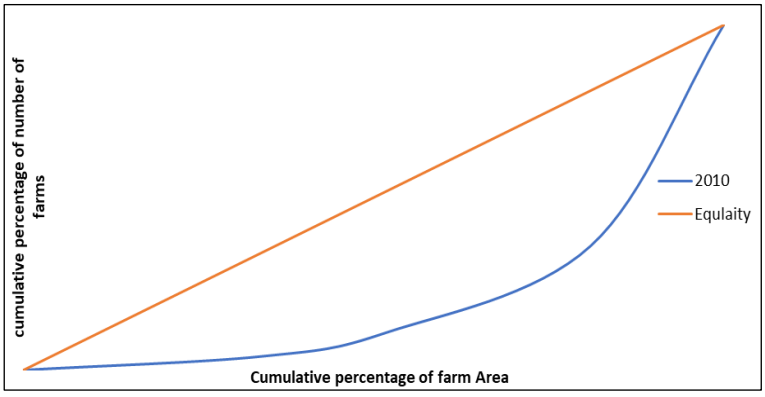
Operated area (acres)	Total Farms (millions)	of Farms not fragmented	Total	Number of fragmented farms (percentages)				
				2-3 Fragments	4-5 Fragments	6-9 Fragments	≥10 fragments	average number per farm (%)
		%	(%)	(%)	(%)	(%)	(%)	
Under 5	5.35	75.77	24.23	19.6	3.35	1.24	0.04	2.73
5-12.5	2.05	53.5	46.5	34.3	6.8	5.2	0.13	3.1
12.5-25	0.56	37.2	62.8	44.13	12.35	6.05	0.35	3.2
>25	0.3	25	75	42	20.4	12.95	0.74	4.6
Total	8.26	66	34	25.42	5.46	2.93	0.1	3

Source: Agricultural Census, 2010

3.5 Lorenz Curve

The level of skewness and inequality in distribution of land was calculated by establishing a relationship between farm area and total number of farms in Pakistan. Lorenz curve was created using land distribution data from 2010; Lorenz Curve shows a higher level of inequality in the land distribution among landholders (Figure 1.4).

Figure 4
Lorenz Curve



4 Small Farms in Pakistan: Challenges and Opportunities

Small farms can be defined in a numerous way; most common way to measure small farm is farm size, small farms are defined as having less than 2 hectares of farmland. Small farms are also described as those for most of the labor depends on the household members for staple food (Hazell et al., 2007). Small farms are defined as smallholder as farmer with limited resource endowment as compared to other in the sector by an FAO Study (Dixon et al. 2003).

A vast majority of farm in many developing countries comprises of small agricultural holdings. World Program of Census of Agriculture (WCA, 2010) indicated that the smallest size of holdings in the world is in Asia and Pacific region. About 87 percent of world small farms around 500 million (less than 2-hectare area) are in pacific and Asia (IFAD, 2009). From a study by FAO in 114 countries in the world against an overall average

size of 5.5 hectare, the average holding size in Asia is only 1 hectare (APCAS, 2010). In Pakistan, 58 percent of the farms are small farms operating less than 2 hectare and command over just 16 percent of total farm area (IFAD, 2009).Overall the farm size shows a declining trend in Asia, same as other countries average farm size in Pakistan also decreased from 5.3 hectare in 1971 to 3 hectares in 2010. In contrast, share in farm area and total number of small farms has been increased in Pakistan like many other Asian countries, total number of farms are tripled between the period of 1970-2010.

Contribution of Small farms to the total agriculture output value is considerable in many countries. Many studies have also described the importance of small farm by confirming the inverse relationship between farm area and productivity. The inverse relationship among farm area and productivity is under debate from many years, the debate on this topic started with Sen's (Sen, 1962) influential work using India's farm management survey data. He found empirical evidence of relative superiority of small farm over large farms with concerned to per unit land productivity. After that, a numerous number of studies have been conducted confirming or rejecting the inverse relationship between farm size and land productivity in many developing countries. In Pakistan, not much but enough work has been done on this topic. Inverse relationship between farm size and land productivity was confirmed by Maqbool et al., (2012) and Chaudhry et al. (1985) while in another study, it was stated that small and large farms have more land productivities than middle farms. Land productivity in small farm is high due to intensive labor use and in large farm due to intensive capital use, on the other hand middle farm use inefficient combination of inputs (Kiani, 2008). Factor of production prices varies between large and small farms; price of labor is cheaper for small farms and prices of labor and land are low for large farms. Small farms have high labor to land ratio due to cheap labor, on the other hand, large farm use capital and land intensively. Small farms can cultivate a large part of their land, can exploit more land due to lower opportunity cost and as a result achieve higher output and yield.

Main feature of the agriculture in Pakistan are small farmers and small farms. For the well-being of the society and country prosperity of small farm is very important. A small farmer always tries to get more out of what he has in order to survive and

using less land and capital learn how to live better (Ikerd, 1997). With green revolution, researcher showed that there is no more inverse relationship found between land productivity and farm size, as agriculture is now more capital intensive. Therefore, an appeal for large farm size in Asian countries rose during 1970 and 1980. Later on, in last decade of 20th century 'small is beautiful" concept started getting more importance. Cash crops, livestock, horticulture, organic agriculture, tunnel farming are new concept due to which small farm agriculture has got comparative advantage or large farms in many countries. On the other hand, large farms degrade the quality of natural resources due to intense capital use.

With lot of opportunities for agriculture and rural development in prosperity of small farms, they are facing severe challenges. Natural disasters and pest attacks are creating problem for livelihood of household dependent on small farms. Small farm holders have fewer cropping strategies and are more vulnerable to food insecurity due to subsistence type of agriculture. Macro-economic policies have not same effect on small and large farms. The nature of input use of both categories is very different, so any policy aimed at subsidizing input may not reach the small farms. Similarly, market intervention policies affect only the farmers those have marketable surplus, and don does not affect small farmers as they have no marketable surplus. In developing countries like Pakistan, the access to financial market is big constraint faced by small farmers. Little of credit is provided to small farms and lot of credit disbursement is made to large farms. Due to difficulty in accessing credit services small farmers cannot expand production in order to take benefits of increasing food prices. New technologies need high capital investment small farms mostly lacked that. From last many years agriculture extension services and research in Pakistan has shifted from public to private sector, which is disadvantageous for small farmers, as private companies are less interested in small farmers. Due to less access to human, financial, social capital and information small farms are more affected by environmental degradation and climate change.

5 Conclusion

Structure of land holding in Pakistan has severe disparities and distribution of farm area is highly skewed favoring large farms. The extent to which farm area is skewed in favor of large farm can be guessed by; large farms (more than 25 acres) comprise just 4 percent of total number of farms and commanding 34 percent of the farm area. There has been improvement over time and percentage share of small farm in total farm area has increased, but still a big proportion is in hand of large farms. This dominancy of large farms in owning means of production leads to severe inequalities in the distribution of wealth and income which is major obstacle in provision of basic need to large proportion of population.

In past, this tenancy was also major problem because poor tenants were handicapped in accessing the different institutes and services, but over time percentage of tenant has decreased. Fragmentation is another feature of agriculture in Pakistan. Despite different consolidation programs in the past the fragmentation issue is there, 34 percent of total farm area is fragmented in Pakistan. Fragments are barrier in investment in farm development projects on farm level.

Most farms in Pakistan are small farms, there are many studies supporting and opposing the idea of inverse relationship between farm size and productivity. Studies in Pakistan showed small farms more labor intensive and more productive than large farms. Due to diversification of agriculture into high value commodities and cash crop and activities like, tunnel farming, organic agriculture, livestock, and horticulture small farms have comparative advantage over large farms.

On the other hand, small farms are also facing many challenges in sustainability. Problems like natural disasters, pest attacks, access to financial markets, unfavorable macro-economic policies are threatening the prosperity of small farms. In order to minimize the inequality in landownership there is need to redistribute agricultural lands, though it is very difficult but a proper legislation and effective implementation of land reforms by government can make it possible. Redistribution of lands from large land holders to small land holders will help in eradicating poverty and improve life standard of rural people. Formation of cooperatives for small landholders will be good step to increase profits of small landholders, a separate sub-department in

Extension, Marketing, and other agricultural departments should be established for small farmers to better analyze and provide their needs and demands.

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