

Capitalisation of Small Farms in Punjab: Magnitude and Policy Issues

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Abstract

Punjab agriculture is highly mechanized and this trend encompasses even the marginal and small farms. Higher costs with limited scope of improvement due to paucity of resources is shrinking the avenues of profitable farming. The present study, based on primary data reveals that the per unit fixed costs on marginal and small farms are high, primarily due to small size of land holding. In order to make farming profitable for this stratum, it is important that such costs need to be reduced. Easy availability of inputs and machinery at special subsidized rates is of paramount importance to generate a potential for sustainable agriculture for these farmers. In this direction, invigorating the numbers and capacity of custom hiring farm machinery service centres need to be looked into, and facilitation of farm inputs at nominal prices is required to reduce the cost of production and to raise the farm income.

Key words: Marginal farmer, Small farmer, Costs, Farm expenditure

JEL classification: Q01, Q12, Q19

Introduction

Agriculture sector is the backbone of Indian economy as provides livelihood to about 60 per cent of the population and contributes 14 per cent to its gross domestic product. Majority of the farmers in India belong to the category of marginal and small farmers (80 per cent of the total operational holdings in the country, cultivating about 36 per cent of the total area) and the number and proportion of such farmers have been growing over time. The rapid increase in population,

sub-division and fragmentation of land holdings and the changed family system from joint to nuclear families in rural India have made the size of holdings smaller. The major problems facing this group are low saving, low investment, low returns, surplus family labour, malnutrition and the possession of un-economic size of farm holdings (Pandey and Kaushal, 1980).

The agricultural development model of Punjab was based on a set of measures aimed at technological up-gradation of old methods of production along with a set of compatible

institutional and policy changes following which the agricultural production process of the state became highly mechanized and capital intensive. There are 4.72 lakh tractors in agriculture, 14 lakh tube wells, and about 11 thousand harvesting combines, 1.68 lakh disc harrows, 1.53 lakh seed drills and 36 thousand straw reapers in the state (PAU, 2017). The heavy farm investment made by farmers in the state is facilitated by easy availability of institutional credit through a widespread network of cooperatives and commercial banks. Having only 2.5 per cent of country's total cultivated area, the state caters to the food security of the nation by contributing about 34 to 75 per cent and 25 to 45 per cent of wheat and rice, respectively to the central pool of food reserves.

In Punjab, the benefits of new farm technology have been cornered much more by the large farmers as compared to the marginal and small farmers owing to viable farm sizes. Agriculture in the state has become cost ineffective over a period of time due to intensive use of different inputs. The cost of cultivation per unit area of principal crops, i.e., wheat and paddy is the highest in the country. According to Kaur *et al.* (2001) "the cost of cultivation on small farms is high due to machinery and others costs as compared to large farmers. The on-farm employment for an average farm operator is not enough to keep him busy throughout the year. An average wholtime farm operator in the state of Punjab operates on about two hectares of land. In case the entire land is under paddy-wheat rotation, it is estimated that these two crops generate a total employment of 300 man days per annum. On an average, two-thirds of this employment goes to hired labour leaving only 100 man days for the farm

operator himself." This shows that human labour employment has been declining in the agricultural economy of the state.

Small land holdings in the Punjab state are witnessing rapid change in costs and returns over the last one decade and they have reached such a stage where, given the produce prices, the future potential for improving returns of the farmers seems to be limited. The plight of small farmers in particular has become vulnerable as there is a lot of literature highlighting that the economic condition of these farmers is in a critical stage (Talib and Majid, 1976); Sidhu and Jaijee (2011) and Singh and Bhogal (2014 a&b). The production pattern of marginal and small farmers is dominated by paddy-wheat crop rotation. The existing system has enhanced the dependence of marginal and small farmers on the market. Even the commodities, which can be produced at the farm for self-consumption at little cost, are being purchased at a higher rate. The liberalization of agricultural economy has been severely affecting the marginal and small farmers because the support of the state with provision of assured procurement through minimum support price and input subsidies are presumably being reduced in near future. Keeping this scenario in view, it is significant to examine the level of mechanisation of small farms in the state.

Data Sources and Methodology

Multi-stage stratified random sampling technique was adopted for this study. District was selected as the first stage-sampling unit, block as the second stage unit, village the third stage sampling unit and the farmer household as the fourth and ultimate stage sampling unit. There are 22 districts in Punjab, comprising of four districts in Sub-mountainous zone

(zone I), 12 in Central zone (zone II) and six in South-western zone (zone III). One-third of the districts in each zone were selected. In this way, one district namely, Ropar from Zone I, three districts namely Ludhiana, Tarn Taran and Patiala from Zone II and two districts namely, Bathinda and Mansa from Zone III were selected for the study. Thus, total six districts were selected for the study. Two blocks from each district were randomly selected. Two villages from each selected block, away from the periphery of the main town of the block were selected randomly. A sample of 100 farmers (marginal and small) from zone I, 300 from zone II and 200 from zone III were selected. On the basis of proportion at the state level, marginal farmers (up to 1 hectare) and small farmers (1.01 to 2.00 hectares) were selected in the ratio of 1:1.4. Thus, in all 600 respondents were selected for the purpose of the present study. The primary data were collected on a specially structured questionnaire through personal interview method during the year 2012-13.

Results and Discussion

Farm expenditure is a major component of the total farm family expenditure. In order to have an in depth analysis of the economic status of the marginal and small farmers of Punjab it becomes important to analyse the item wise farm expenditure. On study of the per household farm expenditure of marginal farmers in the state it was observed that the total cost turned out to be Rs 46392 of which the total fixed cost was 47.64 per cent, i.e., Rs 2210; and variable cost was 52.36 per cent, i.e., Rs 24291 (Table 1). Among the fixed total costs the maximum expenditure was on depreciation of machinery i.e. 25.16 per cent of the total cost, followed by depreciation

of livestock which shared 15.92 per cent of the total cost. Among the per household farm variable costs of the marginal farmers, feed & fodder accounted for the maximum share of total cost as the percentage of the same was 14.18 per cent, followed by land revenue/land rent/crop cess, hired-in-labour and fertilizers that shared 13.61 per cent, 7.06 per cent and 6.13 per cent of the total cost. The zone-wise picture exhibits that in zone I, fixed costs shared the maximum of per household farm expenditure as its share in the total cost was 53.45 per cent and that of variable cost was 46.55 per cent. However, in zone II and III the share of variable cost was higher than the share of fixed cost as the variable costs accounted for 52.98 per cent and 53.78 per cent respectively. Among the fixed cost of marginal farms in zone I, II and III, depreciation of machinery constituted maximum share in the total cost, followed by expenditure on livestock structure and interest on capital. Among the variable costs in zone I, land revenue/land rent/crop cess formed the major portion and its share in the total cost was 13.31 per cent, followed by feed & fodder and hired-in-labour whose share were 12.20 per cent and 6.06 per cent respectively in the total household farm expenditure of marginal farms. In zone II, among the variable costs, feed & fodder shared the maximum percentage of total cost, i.e., 15.61 per cent, followed by land revenue/land rent/crop cess and hired-in-labour that shared 13.27 per cent and 6.93 per cent respectively. The variable costs of zone III shared a pattern similar to zone I as the highest share among the variable costs was that of land revenue/land rent/crop cess that formed 14.22 per cent of the total cost, followed by feed & fodder and hired-in-labour that formed 12.89 per cent and 7.66 per cent respectively, of the total cost.

Table 1. Per household farm expenditure on marginal farms in Punjab

Cost Item	(Rs/farm)							
	Zone-I		Zone-II		Zone-III		State	
	Amount	%age	Amount	%age	Amount	%age	Amount	%age
Fixed cost								
Depreciation of machinery	11271	29.09	11942	25.33	11463	23.33	11670	25.16
Depreciation on livestock/structure	6649	17.16	7228	15.33	7996	16.27	7386	15.92
Interest on fixed capital	2791	7.20	2994	6.35	3251	6.62	3045	6.56
Total fixed cost	20711	53.45	22164	47.02	22710	46.22	22101	47.64
Variable cost								
Seeds	1229	3.17	1941	4.12	2273	4.63	1932	4.16
Fertilizers	1978	5.11	2867	6.08	3252	6.62	2845	6.13
Insecticides./weedicides	243	0.63	465	0.99	549	1.12	456	0.98
Irrigation charges (D.E., E.M.& canal charges)	1604	4.14	1850	3.92	2195	4.47	1923	4.15
Fuel & mobil oil (other than irrigation)	534	1.38	714	1.52	785	1.60	707	1.52
Hired-in-labour	2348	6.06	3267	6.93	3764	7.66	3278	7.06
Land revenue/land rent/ crop cess	5156	13.31	6257	13.27	6987	14.22	6315	13.61
Feed & fodder	4728	12.20	7358	15.61	6334	12.89	6576	14.18
Misc. (minor repair of farm machinery, bldgs.& hiring of machinery).	214	0.55	257	0.55	284	0.58	259	0.56
Total variable cost	18035	46.55	24976	52.98	26423	53.78	24291	52.36
Total cost	38746	100.00	47140	100.00	49133	100.00	46392	100.00

Table 2: Per household farm expenditure on small farms in Punjab

Cost Item	(Rs/farm)							
	Zone-I		Zone-II		Zone-III		State	
	Amount	%age	Amount	%age	Amount	%age	Amount	%age
Fixed cost								
Depreciation of machinery	21521	28.34	23217	25.14	23600	23.77	23064	25.09
Depreciation on livestock/structure	11635	15.32	12626	13.67	15459	15.57	13409	14.59
Interest on fixed capital	6643	8.75	6159	6.67	9419	9.49	7329	7.97
Total fixed cost	39799	52.42	42001	45.49	48478	48.84	43802	47.65
Variable cost								
Seeds	2481	3.27	3908	4.23	4637	4.67	3915	4.26
Fertilizers	4019	5.29	5778	6.26	4911	4.95	5197	5.65
Insecticides./weedicides	448	0.59	923	1.00	1106	1.11	905	0.98
Irrigation charges (D.E., E.M.& canal charges)	3199	4.21	3674	3.98	4484	4.52	3866	4.21
Fuel & mobil oil (other than irrigation)	1061	1.40	1439	1.56	1918	1.93	1537	1.67
Hired-in-labour	4680	6.16	6600	7.15	5982	6.03	6075	6.61
Land revenue/land rent/ crop cess	10488	13.81	12634	13.68	14248	14.35	12818	13.94
Feed & fodder	9324	12.28	14865	16.10	12933	13.03	13301	14.47
Misc. (minor repair of farm machinery, bldgs. & hiring of machinery).	431	0.57	511	0.55	569	0.57	517	0.56
Total variable cost	36130	47.58	50333	54.51	50788	51.16	48131	52.35
Total cost	75929	100.00	92334	100.00	99266	100.00	91933	100.00

The study of the per household farm expenditure of the small farmers in the state observed that the total cost turned out to be Rs 91933 of which the total fixed cost was 47.65 per cent, i.e., Rs 43802; and variable

cost was 52.35 per cent, i.e., Rs 48131 (Table 2). Among the fixed total costs, the maximum expenditure was on depreciation of machinery, i.e., 25.09 per cent of the total cost, followed by depreciation of livestock/

structure, which shared 14.59 per cent of the total cost. Among the per household farm variable costs of the small farmers, feed & fodder accounted for the maximum share of total cost as the percentage of the same was 14.47 per cent, followed by land revenue/land rent/crop cess, hire-in-labour and fertilizers that shared 13.94 per cent, 6.61 per cent and 5.65 per cent of the total cost. The zone-wise picture exhibits that in zone I, fixed costs shared the maximum of per household farm expenditure as its share in the total cost was 52.42 per cent and that of variable cost was 47.58 per cent. However, in zone II and III the share of variable cost was higher than the share of fixed cost as the variable costs accounted for 54.51 per cent and 51.16 per cent respectively. Among the fixed cost of small farms in zone I, II and III, depreciation of machinery shared the maximum share in the total cost, followed by depreciation of livestock structure and interest on capital. Among the variable costs in zone I, land revenue/land rent/crop cess formed the major portion and its share in the total cost was 13.81 per cent, followed by feed & fodder and hire-in-labour whose share were 12.28 per cent and 6.16 per cent respectively in the total per household farm expenditure of small farms.

In zone II, among the variable costs, feed & fodder shared the maximum percentage of total cost, i.e., 16.10 per cent, followed by land revenue/land rent/crop cess and hired-in-labour that shared 13.68 per cent and 7.15 per cent respectively. The variable costs of zone III shared a pattern similar to zone I as the highest share among the variable costs was that of land revenue/land rent/crop cess that formed 14.35 per cent of the total cost, followed by feed & fodder and hired-in-

labour that formed 13.03 per cent and 6.03 per cent respectively, of the total cost.

The analysis of the concentration of farm expenditure is very important from the social welfare point of view. The pattern of the distribution of farm expenditure of marginal farmers in Punjab revealed that the lower 10 per cent of the farm holdings accounted for only 1.78, 1.45 and 2.76 per cent of the total farm expenditure in zones I, II and III, respectively (Table 3). In case of pooled situation the share of lower fifty per cent of the farm holdings in the total expenditure was 28.10 per cent. Contrary to this, the share of upper 10 per cent of the farm holdings in the total farm expenditure at the state level was about 24.86 per cent. The share of lower 10 per cent of the farm holdings when compared with the share of upper 10 per cent brought out wider disparities in the distribution of farm expenditure. In terms of magnitude, the share of lower 10 per cent of the farm holdings was by and large less than two per cent in all the zones whereas, the upper 10 per cent were having more than 25 per cent of the total farm expenditure. The value of Gini coefficient also confirmed this phenomenon. However, it emerged from the analysis that the degree of inequality was less in zone III in comparison to the other zones of the state.

The pattern of the distribution of farm expenditure of small farms in Punjab was also worked out and is presented in Table 4. It can be seen that the lower 10 per cent of the farm holdings accounted for only 1.94 per cent, 2.10 per cent and 2.52 per cent of the total farm expenditure in zones I, II and III, respectively. In case of pooled situation the share of lower fifty per cent of the farm holdings in the total expenditure was 31.53

Table 3. Concentration of farm expenditure on marginal farms in Punjab

Decile Group (%)	(Per cent)			
	Zone-I	Zone-II	Zone-III	State
10	1.78	1.45	2.76	1.63
20	6.52	5.85	6.07	6.69
30	11.40	10.36	11.93	14.75
40	18.36	16.12	19.22	18.46
50	26.64	21.55	25.02	28.10
60	32.05	33.39	36.89	34.89
70	47.13	50.29	47.80	49.36
80	58.35	59.35	61.05	61.28
90	71.46	72.54	76.09	75.14
100	100.00	100.00	100.00	100.00
Gini coefficient	0.3526	0.3582	0.3263	0.3194

per cent. Contrary to this, the share of upper 10 per cent of the small farm holdings in the total farm expenditure at the state level was about 28.45 per cent over the same period. The share of lower 10 per cent of the farm holdings when compared with the share of upper 10 per cent brought out wider disparities in the distribution of farm expenditure. In terms of magnitude, the share of lower 10 per cent of the farm holdings was by and large less than three per cent in all the zones whereas the upper 10 per cent were having more than about 20 per cent over the study period. The value of Gini coefficient also confirmed this phenomenon. However, it emerged from the analysis that the degree of inequality was less in zone III in comparison to the other zones of the state.

The distribution of farm expenditure among marginal and small farmers revealed the vast inequality in the level of farm expenditure. This shows that marginal as well as small farm category in the state is not a homogeneous group itself.

The per hectare total farming cost of the

marginal farmers of the state was Rs 56575 of which Rs 26953 was cost of fixed factors and Rs 29623 was cost of variable factors (Table 5). Among the fixed costs, depreciation of machinery was the major component as its cost was Rs 14232, followed by depreciation of livestock/structure and interest on fixed capital the costs of which were Rs 9007 and Rs 3714 respectively. Among the variable costs, feed & fodder was the main component as its cost was Rs 8020, followed by land revenue/land rent/crop cess and hired-in-labour, fertilizers as the costs of the same were Rs 7701, Rs 3997 and Rs 3470 respectively.

The zone-wise analysis shows that fixed costs were more than variable costs in zone I as the same were Rs 26216 and Rs 22829 respectively. Pattern of expenditure on fixed factors by the marginal farmers was same throughout the three agro-climatic zones with depreciation on machinery being the major component, followed by depreciation on livestock and interest on fixed capital. Among the variable costs, the marginal farmers in zone I spent more on land revenue/land rent/crop cess as the cost of the same was

Table 4: Concentration of farm expenditure on small farms in Punjab

Decile Group (%)	(Per cent)			
	Zone-I	Zone-II	Zone-III	State
10	1.94	2.10	2.52	2.00
20	6.89	7.12	7.12	6.46
30	11.36	11.13	14.59	9.35
40	19.18	18.75	19.18	17.26
50	26.42	29.52	26.02	31.53
60	41.13	39.06	39.34	44.04
70	52.14	48.25	52.14	49.36
80	65.65	63.36	68.22	59.68
90	79.54	80.09	78.35	71.55
100	100.00	100.00	100.00	100.00
Gini coefficient	0.2915	0.3012	0.2851	0.3175

Rs 6526, followed by cost of feed & fodder as they spent about Rs 5985 per hectare for the same. Expenditure on hired-in-labour and fertilizers were the third and the fourth most common component of the variable costs. In zone II variable costs of farming for the marginal farmers were more than the fixed costs as the same were Rs 30459 and Rs 27029 respectively. Pattern of expenditure on variable factors by the marginal farmers of zone II was similar to that of the state with maximum expenditure on feed & fodder, i.e., Rs 8973, followed by land revenue/land rent/crop cess, hired-in-labour and fertilizers, the expenditure on the same was Rs 7631, Rs 3984 and Rs 3496, respectively. The marginal farmers from zone III had higher variable costs than fixed costs as the same were Rs 31456 and Rs 27036 respectively, with land revenue/land rent/crop cess being the major component of variable costs.

The per hectare total farming cost of the small farmers of the state was Rs 55050 of which Rs 26228 was cost of fixed factors and Rs 28821 was cost of variable factors (Table

6). Among the fixed costs, depreciation on machinery was the major component as its cost was Rs 13811, followed by depreciation of animals and interest on fixed capital the costs of which were Rs 8029 and Rs 4388 respectively. Among the variable costs, feed & fodder was the main component as its cost was Rs 7965, followed by land revenue/land rent/crop cess, hired-in-labour and fertilizers as the costs of the same were Rs 7676, Rs 3638 and Rs 3112 respectively.

The zone-wise analysis shows that fixed costs were more than variable costs in zone I as the same were Rs 24720 and Rs 22441 respectively. Pattern of expenditure on fixed factors by the small farmers was same throughout the three agro-climatic zones with depreciation on machinery being the major component, followed by depreciation on livestock / structure and interest on fixed capital. Among the variable costs, the small farmers in zone I spent more on land revenue/land rent/crop cess as the cost of the same was Rs 6514, followed by cost of feed & fodder as they spent about Rs 5791

Table 5: Per hectare farm expenditure on marginal farms in Punjab

Cost item	(Rs/ha)			
	Zone-I	Zone-II	Zone-III	State
Fixed cost				
Depreciation of machinery	14267	14563	13647	14232
Depreciation on livestock/structure	8416	8815	9519	9007
Interest on fixed capital	3533	3651	3870	3714
Total fixed cost	26216	27029	27036	26953
Variable cost				
Seeds	1556	2367	2706	2356
Fertilizers	2504	3496	3871	3470
Insecticides./ weedicides	308	567	654	556
Irrigation charges (d.e., e.m.& canal charges)	2031	2256	2613	2345
Fuel & mobil oil (other than irrigation)	676	871	934	863
Hired-in-labour	2972	3984	4481	3997
Land revenue/land rent/ crop cess	6526	7631	8318	7701
Feed & fodder	5985	8973	7541	8020
Misc.(minor repair of farm machinery, bldgs.& hiring of machinery).	271	314	338	316
Total variable cost	22829	30459	31456	29623
Total cost	49045	57488	58492	56575

per hectare for the same. Expenditure on hired-in-labour and fertilizers were the third and fourth most common component of the variable costs. In zone II variable costs of farming for the small farmers were more than the fixed costs as the same were Rs 30321 and Rs 25302 respectively. Pattern of expenditure on variable factors by the small farmers of zone II was similar to that of the state with maximum expenditure on feed & fodder, i.e., Rs 8955, followed by land revenue/land rent/crop cess, hired-in-labour and fertilizers, the expenditure on the same was Rs 7611, Rs 3976 and Rs 3481 respectively. The small farmers from zone III had higher variable than fixed costs as the same were Rs 29528 and Rs 28185 respectively, with land revenue/land

rent/crop cess being the major component of variable costs.

Conclusion and Policy Implications

In Punjab, the total cost of marginal farmers turned out to be Rs 46392 of which the total fixed cost was 47.64 per cent and variable cost was 52.36 per cent. Among the farm variable costs of the marginal farmers, feed & fodder accounted for the maximum share (14%) of total cost, followed by land revenue/land rent/crop cess, hired-in-labour and fertilizers. Similarly, per household farm expenditure of the small farmers in the state observed that the total cost turned out to be Rs 91933 of which the total fixed cost was 47.65 per cent and variable cost was 52.35 per cent.

Table 6. Per hectare farm expenditure on small farms in Punjab

Cost item	(Rs/ha)			
	Zone-I	Zone-II	Zone-III	State
Fixed cost				
Depreciation of machinery	13367	13986	13721	13811
Depreciation on livestock/structure	7227	7606	8988	8029
Interest on fixed capital	4126	3710	5476	4388
Total fixed cost	24720	25302	28185	26228
Variable cost				
Seeds	1541	2354	2696	2344
Fertilizers	2496	3481	2855	3112
Insecticides./ weedicides	278	556	643	542
Irrigation charges (d.e., e.m.& canal charges)	1987	2213	2607	2315
Fuel & mobil oil (other than irrigation)	659	867	1115	920
Hired-in-labour	2907	3976	3478	3638
Land revenue/land rent/ crop cess	6514	7611	8284	7676
Feed & fodder	5791	8955	7519	7965
Misc. (minor repair of farm machinery, bldgs. & hiring of machinery).	268	308	331	310
Total variable cost	22441	30321	29528	28821
Total cost	47161	55623	57713	55050

Among the per household farm variable costs of the small farmers, feed & fodder accounted for the maximum share of total cost. It is also found that the lower 10 per cent of the marginal farm holdings accounted for only 1.78 per cent, 1.45 per cent and 2.76 per cent of the total farm expenditure in zones I, II and III, respectively. Among these farmers, the share of lower 10 per cent of the farm holdings when compared with the share of upper 10 per cent brought out wider disparities in the distribution of farm expenditure. However, the degree of inequality was less in zone II in comparison to the other zones of the state.

In case of small farm holdings, the lower 10 per cent of the accounted for only 1.94 per cent, 2.10 per cent and 2.52 per cent of the

total farm expenditure in zones I, II and III, respectively. On the other hand, among these farmers of the state the share of lower 10 per cent of the farm holdings when compared with the share of upper 10 per cent brought out wider disparities in the distribution of farm expenditure. However, the degree of inequality was less in zone II in comparison to the other zones of the state.

This analysis shows that small farms are over capitalised in the state resulting into higher per unit costs of production on these farms which eventually reduces the net profits of the farmers. In such a situation it is of utmost importance to reduce such costs and look into the aspect of cheap and easy availability of farm inputs and machinery.

For this purpose, strengthening the number of the co-operative farm machinery service centres and revitalizing their capacity to cater to farmers, especially smaller farmers is of paramount importance. Setting up of such centres at every village to facilitate use heavy farm machinery on custom hiring basis has become necessary over time. Further, the variable costs of production per unit of area are also high on marginal and small farms. Therefore, it is suggested that the marginal and small farmers should be given the farm inputs at nominal prices to reduce the cost of production and to raise the farm income level. Small farmers, often the vulnerable section, also have a role in the overall agricultural scenario; hence, paying heed to their issues and needs to make agriculture a sustainable prospect for them is an important component of the planned comprehensive development of our economy.

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Received: March 2, 2019, Accepted: May 5, 2019