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Constraints Confronting Small Farmers with Special Reference to Wheat Production in the Cotton Based Cropping Zone of Punjab (Pakistan)

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ABSTRACT

Growth in agriculture sector in Pakistan is mainly dependent upon the performance of two main crops in wheat and cotton. Wheat being the staple food crop of the people carries great significance in the overall scheme of development of the economy. Since a major chunk of the total wheat output comes from the small land holders of the country, there are a number of constraints and bottlenecks which confront the wheat producers. Using multiple regression technique to the data, the effect of a number of explanatory variables on wheat production was assessed. The results of the study clearly identified some major variable factors such as sowing time, seed rate and N.P. fertilizer having direct impact on significant increase on wheat production.

Key Words: Small farmers; Wheat Production; Punjab; Pakistan

INTRODUCTION

Small farmers figure significantly in agrarian structure of Pakistan, since they are the major producers of both staple food and cash crops in the country. According to Pakistan Census of Agriculture (Government of Pakistan, 1990), the total number of farms in Pakistan is 5.07 million, of which 81% comprise small farms accounting for 39% of total farm area. The number of small farms in Punjab is 2.35 million, which is 79% of the total farms and they occupy around 40% of the total farm area in Punjab. All these facts and figures show the pivotal position of small farmers in the Punjab.

Ever since the advent of green revolution in Pakistan, small farmers have been facing different kinds of squeeze. It is these farmers who, because of limited land resources, financial constraints and lack of modern farm management know-how, could not effectively reap the benefits of the biochemical and mechanical-engineering technologies.

Although public policy instruments like land reforms, availability of inputs, support price and input subsidies played important role in the development of agriculture, the main beneficiaries of these policies have largely been the large farmers. Small farmers, due to inadequate access to agricultural inputs, remained handicapped in combining the new inputs in an economic optimum way. These constraints added to the cost of production of small farmers in addition to low agricultural productivity. The conditions of small farmers relative to large farm holders have been deteriorating day by day (Chaudhry *et al.*, 1985)

Small farmer's ability to raise productivity and income level is limited by a number of technological, socio-political, economic, structural and institutional constraints (Ahmad, 1996).

The present study was, therefore, designed to trace the constraints confronting the small farmers in the production of wheat crop in the cotton based cropping zone of the Punjab. The results of the study are hoped to help the policy makers, the planners and the extension workers to manipulate a pragmatic approach for eliminating these constraints of small farmers.

The specific objectives of the study were:

1. To examine the income and productivity of small farmers with reference to wheat production.
2. To study the existing level of input use on wheat crop at the small farms.
3. To identify the constraints confronting the small farmers which affect their activities for wheat production.
4. To suggest feasible strategies for relieving constraints on small farms to fill the income and productive differential gap.

MATERIALS AND METHODS

The importance of this study deserved much wider jurisdiction such as the entire cotton based cropping zone of the Punjab, but due to the time and financial limitations of a student researcher, the study has confined to one district only. Bahawalnagar district, in the cotton zone, represents relatively higher percentage of farm holders with medium and small farms compared with other districts of Multan and Bahawalpur division. Therefore, Bahawalnagar district was chosen as the universe of the study. The study area lay in the

lowest rainfall region, where the lands were irrigated either by canal or tubewells.

For the purpose of sampling, one representative tehsil i.e., Tehsil Minchinabad was selected. At the third stage, a random sample of four villages was drawn for further selection of small farm households. Village level sample was drawn in a manner that first village fell within the Municipal limits of the tehsil headquarters; the second at a distance of about 10 km on a metalled road and the third and fourth villages located further five km off the Pacca Road. Finally, a maximum of 25 small owner farm households, with farm size up to 12.5 acres and less was selected at random for detailed study:

1. Marginal farmers ($0 < \text{size} \leq 3$ acres)
2. Very small farmers ($3 < \text{size} \leq 6$ acres)
3. Small farmers ($6 < \text{size} \leq 12.5$ acres)

A well planned and field pretested interview schedule was used to collect the required information from sampled farm household through personal interviews. The field data thus collected were analysed both manually and on the computer. The technique of regression analysis was applied to see the effect of various types of constraints faced by the small farmers. Following model (Greene, 1993) was used in each category separately:

Model: $Y_w = a + b_1$ (sowing time) + b_2 (HYV) + b_3 (Ploughing) + b_4 (seed rate) + b_5 (NP) + b_6 (irrigation) + b_7 (Credit)

where:

Dependent variable

Y_w = Yield per acre of wheat

Independent variables

Sowing time:

1 if at optimum time (before 30 November) otherwise zero.

High yielding varieties

HYV = 1 if high yielding variety otherwise zero.

Ploughings = Number of ploughings

Seed rate = Used in kgs

Fertilizer

NP = Nitrogen + Phosphorous in kgs

Irrigation = Number of irrigation

Credit

Amount of credit received in rupees per farm

RESULTS AND DISCUSSION

The analysis that follows is based on the model specified in previous section on methodology. The wheat production function (Multiple linear regressions) with corresponding standard error of coefficient, t test, F test and R square is presented in the table for wheat production by marginal, very small and small farmers categories, respectively. The function contained seven independent variables i.e. sowing time, HYV, ploughing, seed rate, NP fertilizer, irrigation and credit.

The F value of the function shows that the regression equations were highly significant. Effect of majority of independent variables included in the regression was significant but some of the regression coefficients were also non-significant. The income and productivity effect of different variables on wheat production and constraints confronting the small farmers are summarized below:

A. Cost of producing wheat. There are two major components of cost of production of wheat crop. First component refers to the actual cash costs incurred by the farmers while the second one includes imputed costs of resources owned by the farmers and used in the farming activities. The per acre cost of production of wheat for the marginal, very small and small farmers come to be Rs. 6250, Rs. 6814 and Rs. 7089, respectively. The overall per acre cost of production for all the categories of small farmers averaged to be Rs. 6813. The details of the cost of production are given in Table I.

1. Components of cost and returns

i) Per acre yield. The crop yield is an indicator of return to resources used average in growing of a particular crop. The per acre yield by marginal, very small and small farmers was 27.18, 30.25 and 32.86 maunds, respectively. The overall per acre yield of all the categories of small farmers was estimated to be 31.14 maunds (Anonymous, 1993).

ii) Net income. Net income is defined as the difference between the total receipts and sum of total costs, imputed family labour cost and interest on capital items. The gross cost per acre for marginal, very small and small farmers was Rs. 6250, Rs. 6814 and Rs. 7089, respectively. The gross income for these categories of small farmers was determined to be Rs. 6480, Rs. 7200 and Rs. 7920 per acre, respectively. The net income for marginal, very small and small farmers was Rs. 230, Rs. 386, Rs. 831 per acre, respectively. The overall gross cost and gross income for all the categories of small farmers was Rs. 6813 and Rs. 7440, respectively. The overall net income for all the categories of small farmers was Rs. 627 (Table I).

B. Multiple regress results

i) Sowing time. The coefficient of this variable, with positive t values for all the three farm categories, was highly significant. It reveals that if farmers sow wheat at the optimum time, (before 30 November) the rise in wheat yield per acre should be substantial as can be seen from Table II.

ii) H.Y.V. The coefficient of this variable, with relatively low but positive magnitudes was observed to be non-significant for the marginal and very small farmers. It was, however, significant at 15 % level of probability for the small farmers. The relative non-significant values of this coefficient for the marginal and very small farmers revealed that these two categories of farmers were not adequately fulfilling the optimum requirements of high yielding

varieties of wheat to procure better yields. The positive of small farmers was found to be better.

Table I. Cost of production of wheat for different farm categories

Farming operations	Cost of Production Per Acre (Rs.)			
	Marginal	Very Small	Small	Overall
Preparatory tillage & seed bed preparation	314.00	444.00	455.00	436.00
Levelling	35.00	35.00	35.00	35.00
Bund making	35.00	35.00	35.00	35.00
Seed Cost	447.25	475.50	490.00	436.00
Sowing Cost	35.00	35.00	35.00	35.00
F.Y.M.	160.00	185.00	210.00	180.00
NP Fertilizer	865.00	1070.00	1148.00	1049.00
Application Cost	35.00	35.00	35.00	35.00
Irrigation	550.00	615.00	650.00	606.00
Weedicide, Hoeing	194.00	232.00	250.00	234.00
Harvesting Charges	575.00	575.00	575.00	575.00
Threshing Charges	583.00	640.00	680.00	653.00
Land Revenue & Water charges	33.75	33.75	33.75	33.75
Wages of Artisan	57.50	57.50	57.50	57.50
Management Charges	150.00	150.00	150.00	150.00
Mark up	180.00	200.00	250.00	215.00
Rent of land	2000.00	2000.00	2000.00	2000.00
Total expenditure	6250.00	6814.00	7089.00	6813.00
Cost of production/acre	6250.00	6814.00	7089.00	6813.00
Cost of production/40 Kg	225.00	222.00	215.00	220.00
Gross income/ acre	6480	7200	7920	7440
Net income/ acre	230	386	831	627
Net income/ 40 Kg	8.46	12.76	25.28	20.13

iii) Ploughing (No). The coefficient of this variable is positive for the three categories of farms. The magnitude of the coefficient was determined to be 0.71017, 1.3532 and 0.5132, respectively. It indicates that when one additional ploughing for wheat increases wheat yield significantly.

The relative non-significant nature of the results for the marginal and small farmers shows that most of these farmers were not using deep ploughing.

iv) Seed rate (kgs). The coefficient of this variable had the value of 0.23385, 0.24916 and 0.24851 with positive sign for the three farm sizes and was highly significant. It reveals that with the increase of one kg of seed rate, the yield increase for wheat is 0.23385, 0.24916 and 0.24851 maunds per acre.

Most of the farmers were using less than recommended seed rate. The significance of the results shows that a significant increase in wheat is possible with the increase in the seed rate kg/acre.

v) N.P. fertilizer (kgs). The coefficient of this variable had a value of 0.032351, 0.110733 and 0.88276 for three farm sizes respectively with positive sign. It shows that when one kg of NP fertilizer is increased the rise in per acre yield of wheat comes to be 0.032351, 0.110733 and 0.088276 maunds per acre on respective categories.

The magnitude of the above coefficients indicates that the application of fertilizer is not well balanced and most of the farmers are using less than the recommended doses of fertilizer. The reason is that proper amount of fertilizer is either not available at the sowing time or the farmers do not have the needed purchasing power.

vi) Irrigation (No.). The coefficient of this variable for the three categories of farmers was calculated to be 0.65495, 1.4357 and 0.60957, respectively. The magnitude of the coefficient of this variable reveals that majority of the farmers were not using recommended **delta** of water efficiently. Moreover underground water is brackish and water logging is also a constraint.

vii) Credit (Rs.). The magnitude of coefficient of this variable for the three farm categories had the value of 0.000041703, 0.00011425 and 0.00003182, respectively.

The non-significance of the results indicates that most of the farmers misused the credit facility. It may be concluded that they used it for consumption purposes.

Further, the credit facility to the small farmers community is also not available from public sector institutions. They mostly avail credit from non-institutional sources. The details of the regression analysis are given in Table II.

Constraints confronting the small farmers. A review of the results of this study shows that yield gap exists because of various types of constraints faced by the farmers in the process of agricultural production. The different types of constraints found during study included agronomic, financial, socio-economic and institutional constraints.

It was found that late sowing of wheat was a major constraint. Over 65% farmers were found sowing wheat after 30 November. Inadequate irrigation was another constraint. The technological constraints related mostly to limited access of farmers to agricultural technology like modern tillage practices and important farm inputs like improved seed, chemical fertilizer, irrigation and plant protection measures.

The results of this study show that different groups of small farmers were not making use of recommended levels of inputs such as improved seed, chemical fertilizer, irrigation water, agricultural credit for wheat crop. It was observed that almost 80% of the farmers were living below poverty line. They were, therefore, not able to use recommended amounts of inputs like seed rate. HYV, NP fertilizer, ploughing etc.

Socio-economic constraints. Socio-economic constraints having bearing on farmers income and productivity status were size of holding, fragmentation of holding, extent of tenancy, extent of marketable surplus, input and output prices, level of human capital formation, off-farm employment opportunity. The negative inputs of the above limitations were evident from the results of this study.

Farmers limited access to credit, extension services, marketing and transportation services marketing and transportation infrastructure was another source of inefficiency. In a developing country, like Pakistan, here small farmers make up over 80% of the farming community, a development strategy, which does not include raising the

productivity and income status of small farmers, will remain ineffective.

Table II. Multiple regression results by farm size categories

Variable	B			Standard Error of B			Probability		
	Marginal Farmers	Very Small Farmers	Small Farmers	Marginal Farmers	Very Small Farmers	Small Farmers	Marginal Farmers	Very Small Farmers	Small Farmers
Sowing Time	1.8137	1.5936	2.0739	0.79105	0.75369	0.73922	0.029	0.042	0.008
H.Y.V.	0.68613	0.58404	0.56376	0.90538	0.63119	0.76951	0.454	0.362	0.469
Ploughing	0.71017	1.2532	0.5125	0.5000	0.73961	1.0335	0.156	0.100	0.153
Seed rate	0.23385	0.24916	0.24851	0.100633	0.10783	0.12433	0.027	0.027	0.054
N.P. Fertilizer	0.03233	1.0154	0.110733	0.3032	0.033517	0.055697	0.294	0.005	0.063
Irrigation	0.6546	0.41659	1.4357	0.47949	0.49133	0.68787	0.181	0.403	0.045
Credit	0.00004	0.00011425	0.000031782	0.000173	0.000062431	0.000051368	0.812	0.076	0.540
Constant	11.5690	5.867531	4.128314	-	-	-	-	-	-
R. Square	0.78	0.851	0.787	-	-	-	-	-	-
Multiple R	0.887	0.921	0.887	-	-	-	-	-	-

SUGGESTIONS

1. The small farm holders will essentially remain the most integral part of farm business in Pakistan in general and the Punjab province, in particular in the coming years. In view of their significant contribution towards the overall stability of the economy, there is a strong need to make them viable and sustain their economic activities as far as possible.
2. The greatest limitation confronted by this group of peasantry is their access to the latest available technologies for want of purchasing power. The development planners and strategists need to give full attention to make policies which enhance their access to easy credit.
3. The law of inheritance which still operates in matters of transfer of landed assets needs to be seriously looked into with a view to arrest the increasing trend of subdivision of ancestral holdings.
4. Small to very small farm holdings are increasing becoming un-economical to operate efficiently. The government needs to chalk out plan and policies which encourage and facilitate their exit from farming to other profitable enterprises. This would, of course, require a very bold initiative on the part of government.
5. For lack withholding power, the small farmers rarely get fair returns to their efforts in the production process. The government has a major role to play here by way of ensuring minimum but fair price of outputs coming from this unorganized silent majority of farmers.

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