PROFITABILITY OF WHEAT PRODUCTION IN DERA ISMAIL KHAN

Samiullah*, Mehmood Shah*, Kalim Ullah**,
Rehmat Ullah*** and Ibrarullah****

ABSTRACT:- **This study sought to assess the cost and gross margin of wheat in Dera Ismail Khan District, Khyber Pakhtunkhwa (KPK) Pakistan, in the wheat crop season during May-June, 2012. A survey method was employed and 11 villages were selected at random which are the major wheat producing villages in the said district. A total of 50 respondents were probed by personal interview method from the sampled villages. Cost and return (gross return) data from the respondents were analyzed. Farm budgeting technique for estimating cost, gross return and profitability was applied. The analysis of data revealed that the average cost per acre was Rs. 24716.32. Similarly average production of wheat (output) was estimated to be 1618.40 kg acre^{-1}. Thus the gross return was Rs. 45315.39 acre^{-1}, whereas the net return (profit) from wheat production was Rs. 20599.07 acre^{-1}. It is thus concluded that profit is under the direct positive influence of price and output of wheat grain whereas cost had negatively affected the wheat profitability.**

Key Words: Wheat; Cost; Profitability; Net Return; Pakistan.

INTRODUCTION

Agriculture plays a vital role in overall performance of the economy of the country; its crop sub-sector contributes the major portion of total value added in the sector. Wheat is the most important crop, grown all over the world especially in Pakistan. It has very large area and tonnage among all food crops. Wheat is both staple food and cash crop for majority of the population all over the world including Pakistan. Its grain and straw are fed to livestock as a feed. It supplies around 53% and 59% of the total daily caloric and protein intake, respectively, to the people (Stewart et al., 2007). Wheat constitutes the most important crop that contributed 10.1% towards value added in agriculture and 2.2% to GDP of the country (GoP, 2013). Wheat crop is grown very extensively in our country on a subsistence level for purpose of consumption and also as a cash crop. On an average, the household incurs 16.26% of the monthly expenditures on wheat and wheat flour. The present per capita consumption of wheat is 37.5 kg annum^{-1} (GoP, 2010).

The two main components i.e., wheat productivity and yield are the important determinants contributing to profitability of wheat. Average wheat yield that ranged between

* Department of Economics, Gomal University, D.I. Khan, Pakistan.
** Pakistan Central Cotton Committee, Cotton Research Station D.I. Khan, Pakistan.
*** Department of Agricultural Extension, The University of Agriculture, Peshawar, Pakistan.
**** Faculty of Agriculture, Gomal University, D.I. Khan, Pakistan.
Corresponding author: kalimpbgian@yahoo.com

2000 and 2500 kg ha^{-1} during the 1990s is much lower than the actual potential in spite of the fact that the input use level per acre is moderately high in Pakistan (Byerlee et al., 1986). While, economically achievable yield as suggested by the on-farm wheat trials are around 3500 kg ha^{-1} (Byerlee, et al., 1986; Aslam et al.,1991; Hobbs et al., 1992; Todorović and Filipovic, 2010). In the recent years, area under wheat increased to 8.7 m ha in 2012-13 from 8.65 m ha in 2011-12 showing an increase of 0.5% over last year's area with an average yield of 2787 kg ha^{-1} (GoP, 2013). According to study of Khan et al. (2008) average grain yield of wheat is calculated as 27.30 md acre^{-1}. The price received by farmers was Rs. 427.85 md acre^{-1}. Thus, giving a return of Rs.11680.31 acre^{-1} from wheat grain sold in the market. Therefore, gross returns of wheat production are Rs. 16256.31 acre^{-1}. Net returns (gross margins) of wheat production are Rs.5225.75 acre^{-1}.

The area under wheat crop in Khyber Pakhtunkhwa in 1991-92 to 1999-2000 decreased from 8.4 m ha to 8.0 m ha showing a decline of 4.23%. Similarly, total production of wheat in KPK during the same period decreased from 1.16 m t to 1.06 m t showing a decline of 8.21% and the yield of wheat also declined from 1381 to 1324 kg ha^{-1} in KPK showing a decline of 4.12% (Khan et al., 2008).

Wheat consumption in the world, especially in Pakistan increased sharply with the passage of time. This increase can be attributed to high rate of population growth, improvements in wheat processing technology and people income. Wheat production can be increased either by increasing area under wheat cultivation or by increasing yield of wheat per units of input. The scope for increase in area under wheat is limited due to scarce availability of land on one hand and competitiveness of other crops including oil seeds, pulses, sugar cane, and fodder crops for the same available land (Khan et al., 2008). That is why major emphasis is to increase per hectare yield which can only be handled when an appropriate production tech-nology is adopted including use of high yielding varieties, proper sowing time, proper and timely inputs use, weed control and above all sufficient availability of water for irrigation purposes. The present study is thus formulated to sort out the cost and gross margin of wheat to provide a guiding tool for devising better strategy to sustain better profit.

MATERIALS AND METHOD

The present study was conducted in May-June 2012. The sample area comprises major wheat producing locations of district namely; Dhakki, Mianwada, Mathraabad, Jhok Ghamywali, Habib abad, Bilotsharif, Himat, Jhok Moazam, Matwala Shah, Chura and Jhok Malkanri. These villages were selected randomly with the cooperation of local residents and farmers. All the wheat growers in the area were considered as population among which 50 farmers were contacted as a sample for study. Structured interview pattern was made to collect quantitative data. The interview pattern was pre tested for fine results and necessary changes were made. Interview questionnaire was used during a survey to collect information. Farmers were contacted

individually at their fields, home and *hujras*. The questions were clarified to the farmers to get first hand information. The interview was based on various questions including land holding, total cultivated area, area under wheat cultivation, various inputs used, etc. Main focus was on the various inputs used which has a impact on profitability and culti-vation enhancement, suggestions of farmers and kind of help they need.

Statistical Analysis

Econometric view (E-view) pack-age was used for data analysis. The procedure applied was as follows:

Wheat Profit Function

Profit or net revenue
(Π) = total revenue (TR) - total cost (TC)
$$\Pi = TR - TC \text{-----------------------(1)}$$

where,
TR = P*Q (P = price of output and Q = output)
TC = V*X (V = input price and X = input purchased)

therefore
$$\Pi = PQ - VX \text{-----------------------(2)}$$

Modeling Wheat Profit Function

The empirical model of wheat profit function in econometric form may be given as:

$$\Pi = \beta_o + \beta_1 P + \beta_2 Q + \beta_3 C \text{--------(3)}$$

Equations (1) and (2) are used to generate equation (3) above. It indicates that profit (Π) depends on output price (P), total output (Q) and cost per unit (C) of output produced βs are the parameters to be estimated

and measure the change in Π with a unit change in the variables on right hand side as the case may be (Debertin, 2012).

RESULTS AND DISCUSSION

The major components in the cost of wheat production were variable cost that includes land preparation, seed, chemical fertilizer, irrigation water, weeding/hoeing, pesticides, and harvesting, threshing etc. There exists some difference between the costs of wheat production of different respondents due to the variations in price of the input variables. On aver-age total cost of wheat production per acre was Rs. 24716.3 (Table 1). This includes all costs incurred on the variable inputs. On average wheat yield (output) of 40.46 md per acre (40 kg) is obtained. The gross return from the wheat grain per acre was Rs. 45315.39 Wheat *bhusa* was stored at the home and used as a ration for animals and also for some other domestic purposes.

Net Return of Wheat Production per Acre

Net return per acre is calculated using equation (1) as:
Net return = gross return per acre-cost per acre
$$= 45315.39 - 24716.32$$
$$20599.07 \text{ Rs. acre}^{-1}$$

Three main factors that deter-mine the net return from wheat pro-duction per acre are:
(1) P = Price of output received by the farmer
(2) Q = Output of wheat produc-tion
(3) C = Cost of wheat produc-tion

Table 1.   Cost of production of wheat in Dera Ismail Khan

S.No.	Inputs	Unit	Quantity	Rate/Unit (Rs.)	Total Cost (Rs.)
1.1	Tractor	Hours	4.200	800	3360.000
1.2	Labour	PDs	4.400	300	1320.000
1	**Land preparation**	**Rs.**	-	-	**4680.000**
2.1	Seed	kg	49.400	55	2717.000
2.2	Labour	PDs	2.400	800	1920.000
2	**Seed & sowing**	**Rs.**	-	-	**4637.000**
3.1	Urea	Bags	34.900	48	1675.200
3.2	Nitrophos	Bags	51.200	54	2764.800
3.3	Transportation (Labour)	Rs.	2.300	110	253.000
3.4	Application (Labour)	PDs	1.810	300	54.000
3.5	FYM	Trolley	0.310	1500	465.000
3.6	Application (Labour)	PDs	2.530	300	75.600
3.7	Transportation (Labour)	Rs./PDs	0.038	80	3.112
3	**Farm inputs**	**Rs.**	-	-	**6463.112**
4.1	Tube well	Rs./hour	1.620	300	486.000
4.2	Canal	Seasonal	1.000	800	800.000
4.3	Labour	PDs	2.810	300	843.000
4	**Irrigation**	**Rs.**	-	-	**2129.000**
5.1	Hoeing	PDs	0.860	65	55.900
5.2	Pesticides	Bottles	0.950	478.33	454.413
5.3	Spray pumps	Rs.	0.930	25	23.252
5.4	Labour	PDs	0.698	300	209.400
5	**Pesticides**	**Rs.**	-	-	**742.966**
6.1	Harvesting	Per acre	1.000	800	800.000
6.2	Thressing	Maunds	38.630	100	3863.000
6.3	Empty bags	Per bag	19.812	20	396.240
6	**Harvesting/Threshing**				**5059.240**
7	**Rent of hired land**	Per acre	0.201	5000	**1005.000**
	Total cost	*Rs.*			*24716.318*

Estimation of Model---------------(3)

$$\Pi = -0.0006 + 0.999\ P + 0.055\ Q - 1.00\ C$$

Standard
error $= [0.0003]\ [6.65E^{05}]$
$[0.07]\ [1.33E^{-08}]$

t–ratio $= [-1.69]\ [1548.13]\ [0.75]$
$[-753562]$

$R^2 = 1.00,\ R^2\ \text{(adjusted)} = 1.00,\ F = 7.86E^{20}$

F-test determines the overall goodness of fit/ significance of the model. In our estimated model F-test value is very high. In this model the calculated value of F-statistic ($F_{calcuated}$ = $7.86E^{20}$) which is greater than the tabulated value of F-statistic ($F_{tabulated}$ = 3.32). The model shows the overall significance.

The coefficients of determination (R^2), indicates that the 100% variations in the dependent variable has been explained by the independent variables. The sign of independent variables shows that the effects of explanatory variables are according to the theory. The theory states that the relationship between profit and cost is negative; relationship between the profit and output of wheat is positive and the relationship between the profit and price of output is also positive.

$t_{calculated} > t_{tabulated}$ = 1.895, shows that the t-ratios of the factors in the model of wheat profitability confirms that, profit of the wheat production (Π) is significantly determined by the three already mentioned factors of the model keeping all the other inputs constant. Thus,one rupee increase in per acre price (P) of wheat will increase the profit by Rs.0.18, producing another kg of output (Q) will increase the profit by Rs.0.06 while each additional unit of per kg cost (C) will decrease the profit by Rs.1. The estimation of the profit function revealed that profit is significantly affected by the above three mentioned factors. However the effect of cost is higher than the effect of price and output of wheat.

The present study, therefore concludes that profit is under the direct positive influence of price and output of wheat grain whereas cost had negatively affected the wheat profitability. A well planned policy should be devised for timely supply of inputs with stable prices to earn maximum profit.

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