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AN ECONOMIC ANALYSIS OF CUT-ROSE FLOWER IN PUNJAB, PAKISTAN

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ABSTRACT

Flowers are used for expressing or exhibiting the innermost feelings to the beloved ones or complementing any one or versifying any conceivable emotions. The export of cut flower from Pakistan is very negligible as compared to other countries like Holland, USA, Columbia, Kenya, Zimbabwe, Japan and Israel. This paper examined the cost and return of rose cut flower along with Cobb Douglass production function to determine factors affecting rose cut flower productivity. A farm level survey was conducted in 2011 and 100 respondents were selected for primary data collection in District Kasur using random sampling technique. Yield per acre per year was highest for medium farmer's i.e 812683 pieces followed by large and small farmer's i.e 769562 pieces and 736426 pieces, respectively. Gross margin per year was highest for small farmers (Rs.785473) followed by large, which were Rs.699200 and medium farmers; Rs.546088. Net income of small, medium and large farmers were Rs.759065, Rs.519680 and Rs.672792, respectively. Benefit cost ratio was greatest for the small farmers 2.84:1 followed by large and medium farmers' i.e 2.57:1 and 2.23:1, respectively. The results of the findings revealed that education (year), land preparation cost, fertilization cost, FYM and chemical cost had positive and significant effect on the yield of rose cut flower. While the, flower growing experience and irrigation had positive but non-significant impact on yield. Plant population has negative and insignificant while labor man-days has negative and significant impact on yield. The R^2 and F-value was 0.66 and 19.65 which indicate the overall significance of the model.

Key words: BCR, Cobb Douglass production function, Cut-Rose, Net Income, Pakistan

INTRODUCTION

Diversification of agricultural production is seen as a priority for least developing countries to reduce dependence on primary commodities. The main reason is, despite high dependence on these commodities for their livelihood, declining trend of prices for primary agricultural commodities (Humphrey, 2006). Accordingly, floriculture sector is chosen for enhancing farm incomes and reducing poverty in developing countries. Fewer economies of scale and labor-intensive nature of production in cut flower industries are major sources of comparative advantage for developing countries (Labaste, 2005).

The largest producers of commercial cut flowers are Holland, USA, Columbia, Kenya, Zimbabwe, Japan and Israel. Total area for production of ornamental plants in these countries is 223145 hectare. According to Rabo Bank (Holland) the total sale amount for ornamental plants is about 50 billion dollar worldwide. Cut flowers are the leaders of the ornamental plants with a total sale amount of 24.7 billion dollar (Kendirli and Cakmak, 2007).

Manzoor *et al*. (2001) reported that the return per rupee spend ranged from Rs.1.47 to Rs.2.36 of different types of flowers grown in Lahore by producers and the return per rupee spend was 1.18 on an average for the retailers. The share of producer in consumer rupee was 56.6 percent and for retailer was 43.4 percent, respectively. Jahan (2009) studied that the production of flower is a profitable business as the return are double than cost, which indicate high profitability. There is problem in production, marketing and transportation of cut flowers production (Baris and Uslu, 2009).

The diverse agro-climatic conditions in Pakistan suit all kinds of floriculture crops, including cut flowers, and pot plants throughout the seasons. In Pakistan growing cut flowers, especially roses, is a very profitable business if done properly on commercial basis. The rose cut flower marketing business is getting popular because of its high demand. As farm holdings are small, therefore a farmer hardly makes his both ends meet from this enterprise. It is high time that innovative approaches were employed by the farmers to increase their income.

In Pakistan cut flowers are mostly grown in Pattoki, Chunnian, Lahore, Rawalpindi and Multan in Punjab, Karachi and Hyderabad in Sindh, Peshawar, Mansehra and Harripur in Khyber Pakhtunkhwa and Quetta in Balochistan. In Punjab tehsils Pattoki and Chunnian are the major rose cut flowers growing areas. The Pattoki market is the biggest cut flowers selling and buying market in Pakistan. Rose, gladiolus, tuberose, statice and marigold are the important cut flowers grown in Pakistan.

The main objective of this paper was to estimate the gross margins, net income, benefit cost ratio and the

impact of different socioeconomic and agronomic factors on the rose cut flower productivity.

MATERIALS AND METHODS

The data were collected from tehsils Pattoki and Chunian through farmer's interviews using a well-structured and pre-tested questionnaire in 2011. From cut flowers, rose cut flower was targeted. From each tehsil 50 cut roses growers were selected as respondents using simple random sampling technique. Thus, total 100 respondents were taken for the study.

Data Analysis: The data were analyzed by using SPSS Version 17 and Microsoft Excel. The respondents were classified into small, medium and large farms according to the size of their area under cut flower acreage. The farmers having cut flowers acreage of less than 2.5 acres were termed as small farmers; those with cut flowers acreage between 2.5 acres to 5 acres were placed under medium farmers, whereas farmers having more than 5 acres of cut flowers were classified as large farmers.

Estimation of Costs and Incomes: Net value of the produce and cost involved were estimated. Cost of variables inputs such as labor, ploughing, planking, seed, fertilizer, irrigation, hoeing, pesticide, weedicide and picking were calculated.

Gross Margin

GM = TR - VC

Whereas

GM = Gross Margin
TR = Total Revenue
VC = Variable Cost

Net Income

NI = TR - TC

Whereas

NI = Net Income
TR = Total Revenue
TC = Total Cost

For estimating net income total cost was subtracted from total revenue. Total cost includes variable cost plus land rent and abyana (water charges).

Benefit Cost Ratio: It is defined as the amount received in the shape of profit on the costs of one rupee. The BCR was computed by this method.

BCR = TR/TC

Whereas

BCR = Benefit Cost Ratio
TR = Total Revenue
TC = Total Cost

Econometric Analysis of Data: The Cobb-Douglas production function is the most commonly used functional form for analyzing agricultural production data. The major reasons for using this functional form were due to its mathematical properties, simplicity of computation, and interpretation (Heady and Dillon, 1961). In addition, the Cobb-Douglas production function is relatively simpler to estimate because of logarithmic transformation into linear form (Beattie and Taylor, 1985). The Cobb-Douglas production function was linearized in a double logarithmic function with a view to getting a form amenable to practical purposes was used as expressed below.

$$lnY = lna + b_1 lnX_1 + b_2 lnX_2 + b_3 lnX_3 + b_4 lnX_4 + b_5 lnX_5 + b_6 lnX_6 + b_7 lnx_7 + b_8 lnX_8 + b_9 lnX_9 + lnU_i.$$

Where; Y = Average rose cut flowers yield measured in number of flower pieces per acre.

X_1 =Education measured in years
X_2= Flower growing experience measured in years
X_3 =Land preparation cost measured in Rs.
X_4=Total labor man days No.
X_5 =Plant population No.
X_6=FYM cost measured in Rs.
X_7=Fertilizer cost measured in Rs.
X_8=Chemical cost measured in Rs.
X_9=Irrigation No.
U_i=Error term which included unknown factors affecting the rose cut flower yield of farmers.
ln =Natural logarithm
a= constant

RESULTS AND DISCUSSION

The results of the findings revealed that the average age was highest of the medium farmers 39 years, small and large farmers were about 36 years, respectively. The average schooling years of the sampled farmers were 8 years. Small farmers have flower growing experience of 11 years and of medium and large were 10.93 and 11.50 years, respectively. Average flower growing experience of the sampled farms in the study area was 11.02 years. Average acreage of cut rose of small, medium and large farmers were 1.47 acres, 2.42 acres and 4.33 acres, respectively. Average acreage of cut rose of the sampled farms in study area was 1.77 acres.

The seasonal analysis of prices received of rose cut flower per 100 pieces in the study area by the sampled farms showed that the average seasonal prices received in winter season were highest of small farmers Rs.332.69, medium Rs.322.50 and of large Rs.282.50, respectively. The prices received in spring season of small farmers was Rs.90.64, medium Rs.80.71 and large were Rs.56.50, respectively. Prices received in summer and winter season of small farmers were (Rs.85.76, Rs.190.11), medium (Rs.90.07, Rs.196.43) and large (Rs.65, Rs.152.50), respectively. The prices received were higher in winter season due to Valentine's Day, eids, festivals, marriages and month of Muharram. The small and medium farmers received higher prices than large because they have small holding and focuses on

very much on their production and produce good quality cut rose flowers, which fetch higher prices in the cut flower market.

The details production cost of rose cut-flower is presented in Table-1. The table shows that the average cultivation cost of the sampled farms of small farmers was Rs.2813.28, medium Rs.2997.55 and large farmers Rs.3437.50, respectively. Planking cost was highest of the medium farmers Rs. 736.95 and of small and large farmers were Rs.720.97 and Rs.591.11, respectively. The rotavitor cost of small, medium and large farmers were Rs.1235.38, Rs. 966.67 and Rs. 1000, respectively. Leveling cost was highest of the large farmers as compared to small and medium farmers. Small farmers has highest cost of ridges (Rs.634.69) than medium (Rs.620.71) and large farmers (Rs.591.67). The results of the study also reveal that seed cost was greatest of the large farmers (Rs.200156.25) as compared to small (Rs.181414.75) and medium (Rs.192334.18) farmers. The large farmers of the sampled farms used better quality seed than small and medium farmers. The plant transplanting cost was highest of the large farmers (Rs.4800) than that of small (Rs.4548.75) and medium farmers (Rs.4500), respectively. The results of the study revealed that FYM cost was greatest of the medium farmers (Rs.3840) as compared to small (Rs.3453.44) and larger farmers (Rs.3328), respectively. The fertilizer cost of the sampled farms of the small farmers was Rs.28119.74, medium farmers Rs.28935.1 and large farmers Rs.26945.33, respectively .The earthling up cost of the sampled farms of small farmers was Rs.4230, medium Rs.4307 and large Rs.3950, respectively. It was found that the irrigation cost of the medium farmers was lowest than that of small and large farmers. The picking cost of the sample farms per year were greatest of the small farmers (Rs.87690), medium (Rs.86035.71) and large (Rs.86950), respectively.

Table-1: Production Cost per acre of Rose Cut-Flower in the Study Area (Rs.)

Variable/Unit	Farm Size Categories		
	Small	**Medium**	**Large**
Cultivator cost	2813.28	2997.55	3437.50
Planking cost	720.97	736.95	591.11
Rotavator cost	1235.38	966.67	1000
Leveling cost	1852.63	1500	2233.33
Seed beds/ridges cost	634.69	620.71	591.67
Seed cost	181414.75	192334.18	200156.25
Cuttings/seedlings/plant Transplanting cost	4548.75	4500	4800
FYM Trolleys cost	3453.44	3840	3328
Urea (bags) cost	11073.34	10893.49	10912.22
DAP (bags) cost	11367.04	13260.36	9772
SSP (bags) cost	5679.36	4781.25	6261.11
Earthling up cost	4230	4307.14	3950
Hoeing cost	45941.95	48104.08	43700
Pesticide cost	7360.94	7782.14	8225
Weedicide cost	737.84	783.33	870
Pruning cost	3721.41	3364.29	3208.33
Irrigation cost	10968.69	9816.33	11287.50
Pickings cost	87690	86035.71	86950
Land Rent	26227.68	26227.68	26227.68
Abiana	180	180	180
Variable Cost	385444.43	396624.19	401274.03
Total Cost	411852.11	423031.87	427681.71

Table-2 illustrates the economic analysis per acre of rose cut flower by farm size categories of the sampled farms per year. The results of the study indicated that yield per acre per year was highest of medium farmers 812683 pieces and of small and large were 736426 pieces and 769562 pieces, respectively. Average price per piece received was highest of small farmers Rs.1.59 followed by large and medium farmers Rs.1.43 and Rs.1.16. It was found that total revenue per acre was highest for small farmers Rs.1170917 and of medium and large farmers was Rs. 942712 and Rs.1100474, respectively. Gross margin per year was highest of the small farmers Rs.785473 followed by large Rs.699200 and medium Rs.546088. Net income of small, medium and large farmers were Rs.759065, Rs.519680 and Rs. 672792, respectively. Benefit cost ratio was greatest of the small farmers 2.84:1 and of large and medium was 2.57:1 and 2.23:1, respectively. Dadlani (2003) reported

that cultivation of flower is reported to give 3-5 times and 1.5-2 times more returns than obtained from rice and vegetable cultivation, respectively. These results are in line with the study of Jahan (2009) and Manzoor *et al*. (2001).

Table-2: Economic Analysis of the sampled Cut-Rose Farmers in the Study Area

Variable/Unit	Farm Size Categories		
	Small	Medium	Large
Variable cost (Rs.)	385444.43	396624.19	401274.03
Total cost (Rs.)	411852.11	423031.87	427681.71
Yield/acre (Piece)	736426.01	812683	769562
Average Price/ Piece (Rs)	1.59	1.16	1.43
Total Revenue (Rs.)	1170917	942712	1100474
Gross Margin (Rs.)	785473	546088	699200
Net Income (Rs.)	759065	519680	672792
BCR	2.84	2.23	2.57

Rs. 672792, respectively. Benefit cost ratio was greatest of the small farmers 2.84:1 and of large and medium was 2.57:1 and 2.23:1, respectively. Dadlani (2003) reported that cultivation of flower is reported to give 3-5 times and 1.5-2 times more returns than obtained from rice and vegetable cultivation, respectively. These results are in line with the study of Jahan (2009) and Manzoor *et al*. (2001).

The results of Cobb Douglass production function are presented in Table-3. The education of the farmers is very important because cut flower is a very sensitive business. The coefficient for education was 0.19 which was significant. Education has positive and significant impact on the yield. The coefficient of flower growing experience is 0.10, which is positive but insignificant. Land preparation is very important variable the coefficient for this variable was 0.17 which is significant at two percent level. Land preparation has positive impact on the yield. It indicates that with one percent increase in expenditure on land preparation cost increases yield by 0.17 percent. The coefficient for total labor man-days was -0.19, it was negative and significant, showing that with one percent increase in labor man-days decreases yield by 0.19 percent. The results of the study revealed that there was use of unskilled labor in the study area. Well skilled and efficient persons should be employed for the care and management of the flowers (Younis*et al.*, 2002).

Plant population is very important variable the coefficient for this variable was -0.04, it was negative and insignificant. It showed that with increase in plant population yield decreased but not significantly. FYM is very important variable as it increases the soil fertility. The coefficient for FYM was 0.18. It was positive and significant at one percent level. It indicated that one percent increase in the expenditure on FYM boost yield by 0.18 percent. Munir*et al.*, (2012) reported that farm manure application reduced the deleterious effects of brackish water and enhanced the fertility level of the soil.

Fertilizer is very important input in the production of rose cut flower. There is always need to add fertilizers in soil to fulfill nutrients deficiency to get maximum production. A balanced used of fertilizer with desire level of nutrients is very necessary if one wants to get maximum production. Fertilizer is very essential for cut rose as its pickings have done daily; the coefficient of fertilizer cost was 0.26, which was positive and highly significant at one percent level. It demonstrated that with one percent increase in the expenditure on fertilizer cost enhanced yield by 0.26 percent. There was very much attack of insect, pest on cut rose. It required large amount of chemical. The coefficient for chemical cost was 0.32. It revealed that one percent increase in the expenditure in the use of chemical cost increased yield by 0.32 percent. The coefficient forirrigation number was0.02. It was positive and insignificant. The F-ratio is 19.65, which indicated the overall significance of the model. The results of Cobb Douglass production function are in accordance with the study of Usman *et al.*, (2013) and Usman and Ashfaq (2013).

Table-3: Results of Cobb Douglass Production Function

Variable/Unit	B	t-value	Sig. Level
Constant	5.61	1.58	0.12
ln-education (years)	0.19	2.67	0.01
ln-flowering growing experience (years)	0.10	1.47	0.14
ln-land preparation cost (Rs.)	0.17	2.41	0.02
ln-total labor man-days	-0.19	-2.89	0.01
ln-plant No.	-0.04	-.65	0.52
ln-FYM cost (Rs.)	0.18	2.48	0.02
ln-total fertilizer cost (Rs.)	0.26	3.70	0.00
ln-chemical cost (Rs.)	0.32	4.04	0.00
ln-irrigation No.	0.02	0.32	.75
R^2		0.66	
Adjusted R^2		0.63	
F-ratio		19.65	

Conclusions and Recommendations: Cultivating rose as cut flower is very profitable business as returns are double than the cost. Pakistan is among the countries which has suitable environment for growing of cut rose through the year. The study results revealed that yield per acre per year was highest for medium farmer's i.e. 812683 pieces followed by large and small farmers i.e. 769562 pieces and 736426 pieces, respectively. Gross margin per year was highest for small farmers (Rs.785473) followed by large, which were Rs.699200 and medium farmers; Rs.546088. Net income of small, medium and large farmers were Rs.759065, Rs.519680

and Rs.672792, respectively. Benefit cost ratio was greatest for the small farmers 2.84:1 followed by large and medium farmers i.e. 2.57:1 and 2.23:1, respectively. Education years, land preparation cost, fertilizer, FYM and chemical cost had positive and significant impact on the yield of rose cut flower. There was used on unskilled labor in the production of cut rose by the sample farms in study area. The coefficient of labor man-days was negative and significant at one percent level. The results of the findings revealed that the variable of flower growing experience and irrigation has positive and insignificant impact on yield. The coefficient of plant population was negative and insignificant. The value of R^2 0.66 indicated that 66% variation in the yield of the cut rose is being explained by the explanatory variables included in the model. The F- ratio was 19.65, which indicate the overall significance of the model. There was problem faced by the farmers of high fertilizer cost, shortage of water, fluctuation in daily prices, no proper flower market, lack of cool chain facilities, no training institute, rose thrips, powdery mildews, transport problem, expensive labor, increasing rent and oil prices.

The most obvious implication of the results of this study is that sound policies are needed to promote formal education among rural households as a means of enhancing rose cut flower production in the long run. Policymakers should focus on enhancing farmers' access to information via the provision of better extension services. There is need to investment in land preparation technology; investments in improving agricultural labor productivity; need to promote the use of FYM. Cheap and effective pesticides would be introduced. Farmers should use seed quantity recommended by the floriculture experts in order to maintain plant population at reasonable level. Policymakers should also focus on the development of market and road infrastructure, and supply outlets should be located closer to the farm gate.

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