ESTIMATING THE DIFFERENCES IN PROFITABILITY OF SELECTED VEGETABLES: A DUMMY VARIABLE APPROACH

ABBASULLAH JAN*, AISHA SADIQA***, DAWOOD JAN*, RASHID KHAN****, GHAFFAR ALI*, MUHAMMAD FAYAZ** and MUNIR KHAN*

* Department of Agricultural Economics, NWFP Agricultural University, Peshawar – Pakistan.
** Institute of Business and Management Sciences, NWFP Agricultural University, Peshawar – Pakistan.
*** Department of Economics, Hazara University, Mansehra – Pakistan.
**** Department of Sociology, University of Peshawar, Peshawar – Pakistan.

ABSTRACT

Dummy variable technique was used to find out the statistical significance of the per acre net revenue from growing potato, tomato and cauliflower in district Mansehra during 2004. A total 90 respondents having 30 growers each of the 3 vegetables were randomly selected from the major vegetable growing areas of the district for the survey. After analyzing the data the results show that potato is the most profitable vegetable followed by tomato and cauliflower with net revenue of Rs. 22029, Rs.19998 and Rs.16558, respectively on per acre basis. Though there seems apparent difference in the net revenues of potato, tomato and cauliflower but the one between potato and tomato is not statistically significant; suggesting that given the cost and prices structure of the area, the growers technically are indifferent in choosing to grow potato or tomato for higher profitability. As high quality potato seed is costly and contributes to about 30-40% of the total cost of production in Pakistan, therefore it is recommended that those growers who are unable to get quality potato seed due to non availability or high price they should grow tomato having lesser nursery cost and almost the same return as that of potato.

Keywords: Profitability, net revenue, vegetables, dummy variable approach, Pakistan


INTRODUCTION

Pakistan’s diverse climatic condition provides an opportunity of growing vegetables and condiments including spices in all seasons around the year in all provinces. The vegetables are short duration crops, which can be grown even in small spaces. Improving vegetable productivity will put the prices of vegetables within the reach of urban and rural poor. In Pakistan, more than 36 varieties are grown on large scale comprising potatoes, gourds, tomatoes, cucumbers, lady fingers, turnips, cabbages, brinjal, cauliflowers etc. Condiments such as chilies, seeds of cumin, onions, besides dry spices are produced in large quantities in Pakistan and are exported abroad. These are popular for their freshness, taste and nutritious value (Gop, 2008). The climate of NWFP is very much conducive for producing vegetables (Faheem and Saeed, 1992) with a total cropped area of 1980 thousand hectares, of which vegetables cover 3.6% area (GoP, 2004). In northern districts of NWFP some vegetables are replacing cereal crops like wheat for having returns two times more than that of wheat (Defoer et al. 1993).

Vegetable growing is a profitable farming activity on the one hand and an essential part of the human diet on the other. Another important feature of the vegetables is that these can be grown on a small land holding for self-consumption as well as commercial purposes. Due to quick turn over the trend to grow more vegetable is increasing in the farming community (Zulfiqar et al. 2005, Defoer et al. 1993). The present study is aimed to find out the profitability of producing various vegetables and ascertain whether the difference in profitability across vegetables has any statistical significance.

MATERIALS AND METHODS

The present study was carried out in district Mansehra during 2004. Being the major commercial vegetables in the study area, potato, tomato and cauliflower were selected. Data on returns and cost of production was collected from the growers of the three vegetables. A total of 90 respondents including 30 growers each of the three vegetables (tomato, potato and cauliflower) were randomly selected for the survey from three major vegetable
producing villages of the district; Baffa Mera, Bajna and Ghandian. Several field visits were made to the research sites for the collection of the desired data. The data was analyzed using SPSS software.

The per acre net revenue from each of the vegetable was calculated. In order to find out that whether the difference in net revenue across the three vegetables is statistically significant; the famous econometric technique called “Dummy Variable Approach” is used. For this purpose, the model is specified, as follows (Gujarati 2003)

\[ NR = \beta_0 + \beta_1 TD + \beta_2 CD \]  

Where NR is the per acre net revenue and TD and CD are dummy variables for tomato and cauliflower respectively. The dummy variables carry the following values.

TD = 1 for tomato and  
0 otherwise 

CD = 1 for cauliflower and  
0 otherwise.

In the estimated model, the intercept term \( \beta_0 \) will give net revenue from potato and coefficient \( \beta_1 \) and \( \beta_2 \) are the magnitudes by which the net revenue from other vegetables differs from that of potato. For significant differences between net revenue across different vegetables, the coefficients must be statistically significant (on t- statistic basis).

RESULTS AND DISCUSSION

The estimated model and the results are produced, as follows:

\[ NR = 22029 – 2031TD – 5470.8CD \]  

\[ (10.5)^* (-0.78) (-2.45)^* \]

\[ F \text{ value } = 2.75^* \]

\[ R^2 = 0.45 \]

\[ \text{Jarque-Bera Normality test chi square (2 df) } = 0.773 \]

\[ \text{p-value } = 0.67 \]

Figures in parenthesis represent t-ratios with * are statistically significant at 5 % level of significance. The results given in equation 2 suggest that the net revenue of potato is Rs.22029 while that of tomato is Rs. 2031 less but not statistically significant while the net revenue of cauliflower Rs.5470.8 less and statistically significant than that of potato. The F value is statistically significant at 5 % level of significance indicating a good model fit. The \( R^2 \) is quite reasonable for cross sectional data (World Bank, 2005). As the model used cross sectional data, therefore auto correlation was not considered as a problem (Hussain, 1991) however the problem of heteroscedasticity was suspected for which “White’s Heteroscedasticity-Consistent Variances and Standard Errors” procedure was used as a remedial measure (Gujarati, 2004). Based upon the value of the Jarque-Bera (JB) test and its p-value the hypothesis of the normality of the residuals is accepted. The results further suggest that out of the three vegetables potato is the most profitable with net revenue of Rs. 22029 per acre, followed by tomato and cauliflower having net revenues of Rs.19998 and Rs.16558 per acre respectively. Compared to wheat Potato cultivation has proved to be a profitable enterprise in the northern Pakistan (Malik 1997).

CONCLUSION

It can be concluded from the results of the study that out of the three selected vegetables potato is the most profitable followed by tomato and cauliflower. Though there seems apparent difference in the net revenues of potato, tomato and cauliflower but the one between potato and tomato is not statistically significant; suggesting that given the cost and prices structure of the area the growers technically are indifferent in choosing to grow potato or tomato for higher profitability. As high quality potato seed is costly and contributes to about 30-40% of the total cost of production in Pakistan (Gop, 2009) therefore it is recommend that those growers who are unable to get quality potato seed due to non availability or high price they should grow tomato having lesser nursery cost and almost the same return as that of potato.
REFERENCES


