# An Economic Analysis of Potato Cultivation in Central Plain Zone of Punjab, India

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***Abstract*** **- The study was carried out at School of Agricultural, Lovely Professional University, estimate an economic analysis of potato cultivation in Central Plain Zone of Punjab, India. Based upon a sample of 100 potato growers spreading over 5 villages of the state during 2018-19. CACP cost concept was used in the analysis. In Indian markets for the duration of nineties and former decades at that time India also had the uncertain distinction of having negligible potato processing. However, for the compilation of primary field data was collected with the help of B.Sc. Ag. RAWE students the survey method was used. Category wise net return was highest on case of small farms was Rs. 43373.95 than followed by medium Rs. 42704.37 and marginal category farms Rs. 38207.11 and overall average input output ratio in potato crop per hectare is 1.43, and within the category wise is highest in small category is 1.44, followed by medium 1.43 and small category 1.41 per hectare.**

***Index Terms*** **- Cost of cultivation, BC ratio and CACP cost concept, Net return.**

## I.INTRODUCTION

Central Potato Research Institute (CPRI), Shimla easily deal with these conditions and processing varieties during early nineties and the result out- two potato varieties viz., Kufri Chipsona-1 and Kufri Chipsona-2 during 1998 (Gaur 1999). Potato chips manufacturing industry require these varieties as raw material for production. (Rana et al 2004, Rana et al 2009 Singh et al 2003). Most suitable temperate climate for Potato (*Solanum tuberosum L.*) growth in both sub-tropical and of the world including India, and it is one of the most imperative tuber cash and crops. These crops play a very important role for a source of income, nutritional security, employment, and occupation opportunities. These potatoes can be grown under a wide range of environments that's why it is popular in its worldwide, and also get high nutritional value (Woolfe, 1987) and provide more healthy & nutritious food. Potato are very imperative component of per person daily diet, because full of vitamins and minerals. India is the 2nd one leading vegetable producing country in the world after China. Among all the vegetables, potato can be estimated the fact that it is almost contributes 27.3 % of total vegetable production in India. (DAC&FW, 2017) Although, the major states for the potato production are Uttar Pradesh, West Bengal, Bihar, Punjab, Madhya Pradesh, and Gujarat (Pandit *et al*. 2010).

Being the second largest producer, India occupies a prominent position on google map (Scott and Suarez 2011, Rana 2015). If we compare with china for the production of potatoes, India produced 45.34 million t potatoes (12.32% of world production) against 95.99 million t by China (24.17% of world production) while, third largest producer Russian Federation was produce potatoes 30.20 million (8.20% of world production) in 2013 (FAOSTAT 2015). In 2014 the total world production of potato was 381.68 million tons in of 1.91 million ha area (FAO, 2014).in whole world the potato is most palatable and nutritious efficient food that converting plant, land, water and labour (Sahadevan, 2007). At that moment commercial crops are reallocate towards commercialization of agriculture and farmers rather than other food crops. supplementary income yields to the farmers is one of the commercial cultivations of vegetables (like potato). Poor farm management is applied to the practices of vegetables cultivation in India. (Shivam *et al* 2017). In this present investigation we are trying to find out the economics analysis of cultivation of potato crop in the central plain zone of North West area *i.e* Punjab.

## II.RESEARCH METHODOLOGY

A. Sampling procedure from the study area-

This study involves a comprehensive database of which most are primary with respect to their origin. Keeping in view the limitation of material resources and time factors, the study was conducted using a sample survey method for the collection of relevant information. Sampling design, method of data collection and specification of analytical tools, all these together, constitute the methodological part of the present study.

B. Sampling design

In this study was used multistage sampling technology. In the first stage, the Kapurthala district of Punjab was selected purposively. The second stage, Phagwara block of Kapurthala district was also selected purposively to avoid operational inconvenience because technical guidance provides by School of Agriculture, Lovely Professional university. In the third stage, 5 villages selected randomly namely Hardaspur, Chaheru, Narangpur, Sapror and Maheru. Thereafter, a list of potato growers was prepared in ascending order on the basis of the land holding and divided into four groups viz., marginal, small, medium, and large category of farmers. Random sampling technique given Table 1.

C. Collection of data

The study consisted of both primary and secondary data. For the collection of secondary information, various Government offices and published records were viewed and recorded. However, for the compilation of primary field data was collected with the help of B.Sc. Ag. RAWE students the survey method was used.

D. Analytical tools

Analytical tools used for the analysis and interpretations of the data have been presented below.

E. Average:

The average given refers to the average of the aggregate value. Average was used for the study.

Arithmetic mean = $\sum Xi /n$

F. Tabular analysis

The tabular evaluation method has been used to analyze the different parameters. Investment pattern; Cost of cultivation of potato and returns etc. computed and presented in tabular forms. In this computation weighted average is used.

Weighted mean = $\sum WiXi / \sum Wi$

Where,

Xi = value of an item

Wi = weight of item

Cost concept and other concept used:

A number of CACP cost concepts such as Cost $A_1$, $A_2$, $B_1$, $B_2$, $C_1$, $C_2$ and $C_3$were used in the analysis.

## III. RESULT AND DISCUSSION

Total Cost of cultivation and its break-up of Potato per hectare:

(Rs. / ha.)

Table 1: Total cost of cultivation and its breakup of potato

| S. No. | Particulars | Size group of farms | | | |
|---|---|---|---|---|---|
| | | Marginal | Small | Medium | Average |
| A. | Operational cost | | | | |
| 1. | Human labour | | | | |
| a. | Family labour | 12451.68 (13.30) | 9181.87 (9.38) | 5866.79 (5.85) | 9166.78 (9.43) |
| b. | Hired human labour | 4150.56 (4.43) | 6121.25 (6.25) | 8800.19 (8.78) | 6357.33 (6.54) |
| | Total human labour | 16602.23 (17.73) | 15303.12 (15.63) | 14666.98 (14.64) | 15524.11 (15.96) |
| 2. | Bullock/Machine power | 14096.08 (15.06) | 15765.62 (16.10) | 16117.86 (16.09) | 15326.52 (9.76) |
| 3. | Manure and Fertilizer | 9332.08 (9.97) | 9537.50 (9.74) | 10387.91 (10.37) | 9752.50 (10.03) |
| 4. | Seed | 16463.54 (17.59) | 19198.44 (19.60) | 20110.93 (20.07) | 18590.97 (19.12) |
| 5. | Irrigation | 3750.00 (4.01) | 2755.25 (2.81) | 2524.48 (2.52) | 3009.91 (3.10) |
| 6. | Plant Protection | 4878.47 | 5148.44 | 5349.11 | 5125.34 |

| | | | | | |
|---|---|---|---|---|---|
| | | (5.21) | (5.26) | (5.34) | (5.27) |
| 7. | Interest on working capital | 1843.48 (1.97) | 2046.29 (2.09) | 2215.17 (2.21) | 2034.98 (2.09) |
| | Total operational cost | 66965.88 (71.53) | 69754.66 (71.23) | 71372.44 (71.23) | 69364.33 (71.33) |
| B. | Rental Value of land | 19182.54 (20.49) | 19476.26 (19.89) | 19836.18 (19.80) | 19498.33 (20.05) |
| C. | Overhead cost | | | | |
| 10. | Interest on Fixed Capital | 6788.06 (7.25) | 7908.44 (8.08) | 8175.89 (8.16) | 7624.128 (7.84) |
| 11. | Repair on dead stock | 407.28 (0.44) | 474.51 (0.48) | 490.55 (0.49) | 457.45 (0.47) |
| 12. | Depreciation cost | 271.53 (0.29) | 316.34 (0.32) | 327.04 (0.33) | 304.96 (0.31) |
| | Total overhead cost | 7466.87 (7.98) | 8699.28 (8.88) | 8993.47 (8.98) | 8386.541 (8.62) |
| | Total cost (V+F cost) | 93615.29 (100.00) | 97930.21 (100.00) | 100202.09 (100.00) | 97249.20 (100.00) |

NOTE: Figure in parentheses shows the percentage to the sample farms.

It may be further be observed from the table 1 show that cost of cultivation other potato on an overall average per hectare cost of cultivation of potato was Rs. 97249.20 and category wise was Rs. 93615.29, Rs. 97930.21 and Rs. 100202.09 for the marginal, small, and medium farms, respectively. The share of total operation cost was observed highest on medium size group of the farms was Rs. 71372.44 (71.23 per cent) followed by small 69754.66 (71.23 per cent), and marginal group of farms Rs. 66965.88 (71.53 per cent) and total overhead cost was about 7.98 per cent, 8.88 per cent and 8.98 per cent to the total cost, respectively. The imputed value of family labour found highest on marginal Rs. 12451.68 (13.30 per cent) followed by small Rs.9181.87 (9.38 per cent) and medium Rs. 5866.79 (5.85 per cent) size of farms. The share of average total human labour is 15.96 per cent in total cost of cultivation. The small farmers were using more family labour in crop cultivation. In potato per hectare cost of hired human labour was observed more in medium size group of the farmer Rs. 8800.19 (8.78 per cent) followed by small Rs. 6121.25(6.25 per cent) and marginal Rs. 4150.56 (4.43 per cent).

## IV.PROFITABILITY OF POTATO PER HECTARE

Yield and net returns: The net returns were calculated by deducting the total cost from the gross returns. The Table 1.1. reveals that overall average gross returns per hectare.

Table-1.1: Size group wise gross return, net return and input output ratio of potato (Rs. / ha.)

| S.No. | Particulars | Size group of farms | | | |
|---|---|---|---|---|---|
| | | Marginal | Small | Medium | Average |
| 1. | Gross return | 131822.40 | 141304.16 | 142906.46 | 138677.70 |
| 2. | Cost of cultivation | 93615.29 | 97930.21 | 100202.09 | 97249.20 |
| 3. | Net return | 38207.11 | 43373.95 | 42704.37 | 41428.48 |
| 4. | Total yield on qtls/ha. | 285.54 | 292.80 | 298.73 | 292.3567 |
| 5. | Rate (on Rs. /qtl.) | 461 | 482 | 478 | 474 |
| 6. | Cost of production per qtls. | 327.85 | 334.46 | 335.43 | 332.58 |
| 7. | Input out ratio | 1: 1.41 | 1: 1.44 | 1: 1.43 | 1: 1.43 |

It was evident from the Table 1.1 shows that overall average input output ratio of potato per hectare comes to 1.43, and with on the category wise was highest on small category was 1.44, followed by medium 1.43 and small category 1.41 per hectare. It also Shows that on an average productivity potato per hectare under

was work out to be 292.36 quintals per hectare and within the category it was highest on medium 298.73 quintals followed by small 292.80 quintals and marginal farms 285.54 quintal per hectare. It is evident that this table show overall average input output ratio in potato crop per hectare is 1.43, and within the category wise is highest in small category is 1.44, followed by medium 1.43 and small category 1.41 per hectare.

Table-1.2: Total cost according to different cost concept. (Rs. / ha.)

| S. No. | Particulars | Size group of farms | | | |
|---|---|---|---|---|---|
| | | Marginal | Small | Medium | Average |
| 1. | Cost $A_1$ | 55193.01 | 61363.64 | 66323.24 | 60959.96 |
| 2. | Cost $A_2$ | 55193.01 | 61363.64 | 66323.24 | 60959.96 |
| 3. | Cost $B_1$ | 61981.07 | 69272.08 | 74499.12 | 68584.09 |
| 4. | Cost $B_2$ | 81163.61 | 88748.34 | 94335.30 | 88082.42 |
| 5. | Cost $C_1$ | 74432.75 | 78453.95 | 80365.91 | 77750.87 |
| 6. | Cost $C_2$ | 93615.29 | 97930.21 | 100202.09 | 97249.20 |
| 7. | Cost $C_3$ | 102976.82 | 107723.23 | 110222.30 | 106974.10 |

It was evident from the table 1.3 reveals that on an average per hectare family labour income from potato come to Rs. 57207.31 The family labour income was highest on medium category of farms Rs. 68407.34 followed by small category of farms was Rs. 52555.82 and marginal farms Rs. 50658.78.

## V. INCOME MEASUREMENT APPROACHES

Table-1.3: Size group wise different income of potato. (Rs. / ha.)

| S. No. | Particulars | Size group of farms | | | |
|---|---|---|---|---|---|
| | | Marginal | Small | Medium | Average |
| 1. | Gross return | 131822.40 | 141304.16 | 142906.46 | 138677.7 |
| 2. | Net return | 38207.11 | 43373.95 | 42704.37 | 41428.48 |
| 3. | Family labour income | 50658.78 | 52555.82 | 68407.34 | 57207.31 |
| 4. | Farm business income | 76629.38 | 79940.52 | 76583.22 | 77717.71 |
| 5. | Farm investment income | 64177.71 | 70758.65 | 70716.43 | 68550.93 |

It was evident from the Table 1.3 reveals that on an average per hectare farm business income from Potato was Rs. 77717.71. The farm business income was highest on small category of farms Rs. 79940.52 and followed by marginal was Rs. 76629.38 and a medium category farm was Rs. 76583.22. On an average per hectare farm investment income from potato was Rs. 68550.93. The farm investment income was highest on small category of farms Rs. 70758.65 and followed by medium was Rs. 70716.43 and marginal category was Rs. 64177.71.

## VI. CONCLUSION

The analysis bought out that on potato per farm use of manure and fertilizer was comparatively maximum on large size group of farmers as compared to medium, small, and marginal farmers because the large size group of farmers used maximum doses of manure and fertilizer. In state farmers was using the traditional method they need to adopt new technology and high yield variety and adoption of the new cropping pattern because maximum framers in Punjab use the paddy and wheat cropping pattern. Punjab is the major fertilizer consuming state in the north zone.

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