Potato J (2025) 52 (1): 74-82

ECONOMIC ANALYSIS OF POTATO CULTIVATION IN TRANS-GIRI REGION OF HIMACHAL PRADESH

Sapna Bhardwaj[1*] and Brij Bala[2]

ABSTRACT: Potato accounts for 10.85 per cent of the Himachal's total (17.22 lakh MT) vegetable output, which is the highest among all vegetables. In terms of area and output of potato, the state's third-ranked district is Sirmaur, and the Trans-Giri region of Sirmaur is notable for its high-quality potato production. Therefore, in the light of vital importance of potato in the Sirmaur's agrarian economy, this study reports the economic analysis of potato cultivation in Trans-Giri region which was done based on primary survey of 60 farmers grouped into small and large farmers of Sirmaur district during 2022-23. The total variable cost, total cost and net farm income on overall farm came to be Rs. 17,6368/hectare, Rs. 21,4929/hectare and Rs. 17,1618/hectare, respectively. Hired labour and potato seed made up the majority of the expenses which was around 52 per cent of total variable costs. Potato production seemed profitable with an output-input ratio of 1.80. To increase the production and profitability of potato crop, farmers must rationalize the use of inputs in accordance with package of practices.

KEYWORDS: Economics, Potato production, Cultivation, Trans-Giri, Sirmaur district

INTRODUCTION

Potato (*Solanum tuberosum*) is the third top most consumed crop worldwide after rice and wheat (International Potato Centre, 2022). Andes (South America) is the origin place of commercial potato which is derived from the wild species *Solanum tuberosum*. Around 8,000 years ago, it was at first cultivated near the present border separating Bolivia and Peru. In the 16th century, potato was taken from Latin America to Europe by the Spanish people. In earlier days potato was just admired for its floral beauty before being praised for its tubers, and since then, potato became a vital carbohydrate source in human and animal diets around the globe (Spooner and Hawkes, 1990). Potato is cultivated in more than 100 countries, under different conditions such as temperate, sub-tropical and tropical climates. India is the second-largest potato producer in the world after China, contributing about 12.3 % of global production, with Uttar Pradesh, West Bengal and Bihar together accounting for nearly 74 % of national output (*Rana and Anwer, 2018).*

India's agricultural system revealed its resilience amid COVID-19. The only bright sector was the agriculture and allied sectors clocking a growth rate of 3.4 per cent at constant prices during 2020-21. The share of agriculture and allied sectors in Gross Value Added (GVA) of the country was 17.8 per cent for the year 2019-20. (Economic Survey of India, 2020-21). Despite the obstacles caused by COVID-19, a steady supply of agricultural goods, particularly staples such

*Corresponding author; email: s3vsapna@gmail.com
[1]Department of Agricultural Economics, Extension Education & Rural Sociology, CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur-176062, Himachal Pradesh, India
[2]Department of Agricultural Economics, Extension Education & Rural Sociology, CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur-176062, Himachal Pradesh, India

as rice, wheat, pulses and vegetables, has been maintained, ensuring food security (Economic Survey of India, 2020-21). Potato contribution to agricultural GDP per unit of cultivable land is approximately 3.7 times higher than rice and 5.4 times higher than wheat (Indian Horticulture, 2019). Some popular potato varieties have been developed by ICAR-Central Potato Research Institute for farmers and cover almost 95 per cent of total area under potato. India produced approximately 45.87 million tonnes of potato annually during the triennium 2014-17 and contributed Rs. 57,512 crores annually to the GVA at current price (Indian Horticulture, 2019). During this period, ICAR-CPRI developed varieties which contributed 54,636 crores annually. Four varieties, viz., Kufri Jyoti, Kufri Pukhraj, Kufri Chipsona and Kufri Bahar, jointly contributed around 75 per cent of total area under potato (Indian Horticulture, 2019). The rise in inflation in the 2020 was due to increase in food inflation, which increased from 0.1 per cent in 2018-19 to 6.7 per cent in 2019-20 and further to 9.1 per cent in 2020-21, owing to build up in vegetable prices. Inflation in vegetables remained high during the period September 2019 to April 2020. It decreased to 4 per cent in June 2020 and remained in double digits from July to November 2020. During the lean season, the increase in vegetable inflation was primarily due to increase in onions and potato prices. (Economic Survey of India, 2020-21). The economy of the Himachal Pradesh is largely dependent on agriculture. About 12.73 per cent of total gross state domestic product (GSDP) is generated through agricultural and allied sectors (Economic Survey of Himachal Pradesh, 2019-20). So, it is an essential sector for the sustained growth of state economy. Although Rice, Wheat, Maize are the major agricultural crops grown in the state yet, Potato is also one of the important commercial crops. Out of total vegetable production in the country, major share goes to potato (28.9 per cent). Out of the total 17.22 lakh MT production of vegetables in state, potato accounts for 1.87 lakh MT i.e. 10.85 per cent, which is largest among all other vegetables (Economic survey of Himachal Pradesh, 2019-20). Potato is among the principal cash crops grown in Himachal Pradesh. The climatic conditions in most of the state provide good opportunity for producing both table potato and disease-free quality seed. Himachali Potato is very popular and is sold in various parts of the country as '*Pahari aloo*' that fetches premium price in the market as it is fresh and does not have sweet taste like the cold-stored potatoes. Potato, being an important crop, is grown throughout Himachal Pradesh. Sirmaur district possesses 3rd rank in area as well as in potato production in the state (Statistical Year Book of Himachal Pradesh, 2019-20). The potato grown in high altitude areas of the state is also in great demand as seed potato. Area under potato cultivation is 12.36 per cent (1500 ha.) of the total area under vegetables in Sirmaur (12134 ha.), which accounts for a production of 19,570 tonnes (District Statistical Abstract of Sirmaur, 2020-21). There are 6 blocks in Sirmaur district and Rajgarh, Shillai and Sangrah blocks, as well as few of the panchayats of Paonta Sahib block, are all part of Sirmaur's Trans-Giri region area. Rajgarh and Sangrah blocks alone accounts for 63.34 per cent of district's total land and 63.24 per cent of its total production (District Statistical Abstract of Sirmaur, 2020-21). In this area, the crop is grown between February-March to July-August. Kufri Jyoti variety of potato is used in the region by the farmers. The prosperity of farmers in the state is linked with the development of agriculture. Since cultivable land in the state is extremely limited due to geographical and topographical factors, farmers must resort to commercial crop cultivation to achieve high

returns per unit of land because commercial crops have large input requirement, it is critical to utilize resources efficiently in order to maximize returns per unit of land.

Despite being a major potato-producing region the Trans-Giri area faces difficulties with rising input costs, uneven farm-size productivity, and non-judicious use of resources like labour, fertiliser, and seed. There is not much empirical data on the cost structure, profitability, and resource-use efficiency of potato cultivation in this hilly agroclimatic region, although it greatly boosts farmers' income and the local food supply. It is challenging to develop efficient technological and policy interventions meant to improve the sustainability and profitability of potato farming in the area in the absence of such localised economic analysis. In order to comprehend this, therefore, a systematic economic analysis of potato cultivation in the Trans-Giri region is essential to understand the cost of production, returns, and key factors influencing productivity across different farm categories.

MATERIALS AND METHODS

The study was carried out in the Trans-Giri region of Sirmaur district of Himachal Pradesh in 2022-23. Since, it is well known for its significant potato production and as supplier of high-quality seed potatoes. Two major potato growing blocks, on the basis of area under potato cultivation were selected i.e. Rajgarh and Sangrah. Then, a two-stage random sampling technique was used for the selection of villages and potato growers in two selected blocks. At first stage of sampling, a list of all potato growing villages was prepared for both the selected blocks and a sample of five villages was selected randomly in each of the selected blocks. Finally, a sample of 60 potato growers was selected randomly from ten villages based on the proportional allocation method. Further, the farmers were post-stratified into two categories viz., small (<2 ha.) and large (>2 ha.), on the basis of their total land holding. To accomplish the objectives of the study, both primary and secondary data were utilized. For the study, both tabular and statistical analysis was performed which are as follows:

Cost Concepts

The net returns over various costs were calculated by reducing the different costs from gross returns. The following CACP concepts were used in for working out the costs and returns of potato.

Cost A: Material cost + bullock/tractor charges + hired labour + interest on working capital + miscellaneous charges.

Cost B: Cost A + interest on fixed capital + rental value of owned land.

Cost C: Cost B + imputed value of family labour.

Cost D: Cost C + 10 per cent of Cost C.

The interest on working capital at 6 per cent rate for half of the crop period and also 6 per cent on fixed capital was computed as per the prevailing interest rates during the period under study. Based on the sample survey customary average rental value of land was used.

Farm efficiency measures

For working out profitability of potato in the study areas following farm efficiency measures were worked out:

2.2.1 Gross farm income (GFI)

It is defined as gross value of output including by-product priced at farm harvest rates.

2.2.2 Farm Business Income (FBI)

It is the disposable income of the enterprise. FBI = Gross income - Cost A

2.2.3 Farm Investment income (FII)

FII = Net farm income + interest on owned fixed capital + rental value of land

2.2.4 Farm Family Labour Income (FLI)

It is the return to family labour (including management).

F.L.I = Gross income – Cost B

2.2.5 Net Farm Income (NFI)

It is the net profit after deducting all cost items i.e., variable and fixed costs from gross income.

NFI = Gross income – Total cost (Cost C)

Production function analysis

To examine the extent of use of various resources in production of potato, production functions were estimated using input-output data from individual farmers. To explain the factors affecting the production of potato, multiple linear and log linear functions were fitted. Depending upon the value of R^2 (best fit) and the statistical significance of regression coefficients, multiple log linear production function was employed for analysis and discussion.

The production function used was of the following form:

$$Y = b_0 X_1^{b1} X_2^{b2} X_3^{b3} X_4^{b4} X_5^{b5}$$

Logarithm form of the function is:

$$\text{Log } Y = \text{Log}b_0 + b_1\text{Log}X_1 + b_2 \text{ Log } X_2 + b_3 \text{ Log } X_3 + b_4\text{Log}X_4 + b_5 \text{ Log}X_5 + \mu$$

Y = Output of potato (q/ha)

X_1 = Seed rate (kg/ha)

X_2 = Farmyard manure (q/ha)

X_3 = Fertilizers (kg/ha)

X_4 = Human labour (Man days/ha)

X_5 = Operational holding (ha)

b_0 = Constant term

U = Random term

To examine the significance of each parameter, t-test was employed as under:

SE (b_i) = Standard error of regression coefficient, i = 1,2....5

n = Number of sample observations

α = Selected level of probability (1 per cent, 5 per cent or 10 per cent)

k = No. of parameters /coefficients

RESULTS AND DISCUSSIONS

Total Cost of cultivation

Variable cost structure for potato cultivation on sample farms

Variable costs refer to expenditures on inputs that are consumed within a single production cycle, such as seed, fertilizers, pesticides, and hired labour. As shown in Table 1, seed was the largest contributor, accounting for 17 per cent of all variable costs and 58.57 per cent of all material costs (Rs. 51,198). This emphasizes the importance of seed in guaranteeing crops that are both disease-free and productive. Singh (2010) reported similar findings and came to the conclusion that the cost of seed (31 per cent) was the highest of the material costs. Farmyard manure (FYM) was the second most important input, with approximately 31 per cent of material costs and 9 per cent of total variable costs, indicating its significance in managing soil health. Fertiliser and pesticide costs accounted for 7 per cent and 2 per cent of material costs, respectively; small farms spent slightly more per hectare on fertilisers than large farms, while large farms spent more per hectare on pesticides. The hired labour accounted for about 35 per cent of variable costs on overall farms, making it the second largest component after material inputs, highlights about the labour-intensive potato farming is in the hilly area. Human labour

Table 1. Variable cost structure for potato cultivation on sample farms (Rs. /ha)

Sr. No.	Particulars	Small		Large		Overall	
		Per farm	Per ha.	Per farm	Per ha.	Per farm	Per ha.
1	Material cost						
I	Seed	5302	31191 (17.87)	4414	27588 (15.32)	5006	29990 (17.00)
ii	FYM	2847	16750 (9.60)	2493	15584 (8.65)	2729	16361 (9.28)
iii	Fertilizers	628	3696 (2.12)	571	3569 (1.98)	609	3653 (2.07)
iv	Pesticides	188	1109 (0.64)	218	1361 (0.76)	198	1193 (0.68)
	Sub-total	8967	52746 (30.23)	7696	48102 (26.71)	8543	51198 (29.03)
2	Bullock labour/tractor/power tiller	2202	12953 (7.42)	2079	12994 (7.21)	2161	12966 (7.35)
3	Hired Labour	9792	57600 (33.01)	11160	69750 (38.73)	10248	61650 (34.96)
4	Miscellaneous charges (Rs.)	300	1765 (1.01)	380	2375 (1.32)	327	1968 (1.12)
5	Working capital (1+2+3+4)	21261	125063 (71.67)	21315	133221 (73.97)	21279	127782 (72.45)
6	Interest on working capital (@ 6 per cent p.a.)	372	2189 (1.25)	373	2331 (1.29)	372	2236 (1.27)
7	Cash variable expenses	21633	127252 (72.92)	21688	135552 (75.26)	21651	130018 (73.72)
8	Family Labour	8032	47250 (27.08)	7128	44550 (24.74)	7731	46350 (26.28)
	Total variable cost	29665	174502 (100.00)	28816	180102 (100.00)	29382	176368 (100.00)

Note: Figures in parentheses indicate respective percentages to total variable cost

was the second most expensive factor, after seed (31.19 per cent) making the two most expensive part of variable cost (*Srinivas et al., 2007; Singh, 2010; Sinha, 2019).* Tractor, power tiller, and bullock labour costs accounted for roughly 7 per cent of total variable costs. Family labour played an important role for both small (Rs. 47,250/ha) and large farms (Rs. 44,550/ha) and about 26 per cent of variable costs for overall farms. Human labour and seed were found to be the costliest expenses sample farmers faced when growing potatoes. Similar results were given by Lal and Sharma (2006) who also reported potato crop as the most capital and labour intensive due to substantial cost incurred on seed, fertilizer and human labour. The variable cost varies from Rs. 1,74,504 to Rs. 1,80,102 per hectare from small to large farms.

Fixed cost structure for potato cultivation on sample farms

A thorough examination of fixed costs provides important information about the sustainability and underlying profitability of potato farming in the Trans-Giri area. The fixed costs remain constant regardless of yield or cultivation scale typically comprising interest on fixed capital, depreciation, and the rental value of land and are given in Table 2. Small holders allocated 17.48 per cent of total capital costs to their potato crop, while large farms, growing a wider variety of crops, allocated 9.75 per cent.

The average total fixed cost per hectare for the overall farms was Rs. 38,560, with small farms spending Rs. 38,197 and large holdings spending Rs. 39,288. Land rental, which is the biggest contributor stays constant across farm sizes at Rs. 36,458 per hectare, is noteworthy because it establishes the baseline for fixed cost in these hilly agro-ecosystems. The total cost of cultivating potatoes, when variable costs are taken into account, increases from Rs. 2,12,698 per hectare on small farms to Rs. 2,19,390 on large ones, with an average of Rs. 2,14,929 for the overall farms. The ability of

Table 2. Fixed cost structure for potato cultivation on sample farms

(Rs./ha)

Sr. No.	Particulars	Small	Large	Overall
1	Total variable cost	174502	180102	176368
2	Total fixed cost	38197	39288	38560
a)	Interest on fixed capital	886	1710	1161
b)	Depreciation on fixed capital	852	1119	941
c)	Rental value of land	36458	36458	36458
3	Total cost of cultivation (1+2)	212698	219390	214929

larger farms to invest in more sophisticated inputs, such as superior seed, fertilisers, plant protection, and mechanised labour, is what is driving this upward trend (Akter and Akram, 2020).

Different costs and returns for potato cultivation on sample farms according to CACP cost concepts

The CACP cost concepts were applied to small, large, and overall farms sizes in the Trans-Giri region and compiled in Table 3. A detailed evaluation of farm profitability and planning is made possible by these layered costing techniques, which range from operational (Cost A) to fully allocated cost (Cost D).

Table 3. Different costs and returns for potato cultivation on sample farms according to CACP cost concepts

(Rs./ha)

Sr. No.	Particulars	Small	Large	Overall
1	Cost A	127251.67	135552.22	130018.52
2	Cost B	164595.79	173721.03	167637.54
3	Cost C	211845.79	218271.03	213987.54
4	Cost D	233030.37	240098.14	235386.29
5	Gross returns	391382.73	375172.13	385979.20
6	Net returns over			
i	Cost A	264131.06	239619.91	255960.68
ii	Cost B	226786.94	201451.10	218341.66
ii	Cost C	179536.94	156901.10	171991.66
iv	Cost D	158352.36	135073.99	150592.91
7	Output-Input Ratio	1.84	1.71	1.80

Operating costs (Cost A), which account for the primary financial expenditures for every growing season, averaged Rs. 1,30,018 per hectare; large farms had higher costs, which was indicative of their wider use of cutting-edge inputs and technologies. The Cost B includes interest on fixed capital and the land's notional rental value, was Rs. 1,67,638 per hectare for overall farms. Cost C varies from Rs. 2,11,845 to Rs. 2,18,271 per hectare from small to large farms. Singh *et al.*, (2020) also found that large farms had higher Cost C than small farms. Notably, additional non-cash outflows, such as the imputed value of family labour and management, are included with each subsequent cost category (A, B, C, and D), making Cost D on per hectare to be Rs. 2,33,030 on small farms to Rs. 2,40,098 on large farms.

Overall, potato cultivation yielded gross returns of Rs. 3,85,979 per hectare on overall farms. It's interesting to note that small farms reported roughly 4 per cent higher gross returns per hectare than large farms, which is evidence of smallholders' extensive use of family labour and rigorous input management. In terms of net returns, returns over Cost A averaged Rs. 2,55,961 per hectare, with small farms achieving Rs. 2,64,131 and large farms achieving Rs. 2,39,620. Net returns over Cost B and C varies from Rs. 2,18,341 to Rs. 1,71,991 per hectare on overall farms. The benefit for small farms remains, primarily because of increased family labour contributions and more stringent variable cost control in resource-constrained environments, even though this margin decreases as more expenses are taken into account.

These patterns are further supported by the output-input ratio, which is a summary indicator of enterprise efficiency and stands

at 1.84 for small farms, 1.71 for large farms, and 1.80 overall (Sapkota, 2019). Small farm holders received the highest returns per unit of investment, with an average return of Rs. 1.80 for every rupee invested in potato cultivation. Despite rising input costs high profitability of potato cultivation was found *(Mohammadi et al., 2018; Raghuvanshi et al., 2018; Kumar et al., 2022).*

Farm efficiency

To better understand the efficiency and profitability of potato farming, Table 4 provides detailed calculations for several key performance indicators such as gross farm income, net farm income, farm family labour income, farm business income, and farm investment income.

Small farms earn slightly more than large farms which is Rs. 3,91,383 and Rs. Rs. 3,75,172, with an overall gross farm income of Rs. 3,85,979 per hectare. This suggests that small farm holders are able to maximise output per unit area by closely managing inputs and frequently using labour from their own families. The average farm's net farm income, which represents earnings after all expenses are excluded, is Rs. 1,50,593 per hectare on overall farms. Small farms have net farm income of Rs. 1,79,537 whereas Rs. 1,35,074 per hectare for large farms. This disparity shows how smallholders have a clear edge in turning work into real profit when they rely on family labour and prudent management. The same pattern can be seen in farm family labour income, which is higher on small farms (Rs. 2,26,787) than on large farms (Rs. 2,01,451) per hectare. Farm family labour income is the returns earned by family labour after major expenses are covered. This is a direct result of family labour being more readily available and frequently used in small-scale businesses where each member's input has a quantifiable impact.

Table 4. Measures of farm business returns for potato on sample farms

(Rs./ha)

Sr. No.	Particulars	Small	Large	Overall
1	Gross farm income	391383	375172	385979
2	Farm business income	264131	239620	255961
3	Farm family labour income	226787	201451	218342
4	Farm investment income	216881	193950	209238
5	Net farm income	179537	135074	150593

The trend continues when looking at farm business income, which is the operating surplus after basic production costs are deducted: small farms report Rs. 2,64,131, while large farms report Rs. 2,39,620 per hectare. Small farms have higher farm investment income (Rs. 2,16,881) than large farms (Rs. 1,93,950), which is indicative of more effective capitalisation and use of owned resources. Additionally, When combined, these metrics consistently show that small potato growers are more profitable and efficient on their farms. It's evident that small farms' resource-conscious, family-cantered business model helps them generate greater profits, highlighting the value of domestic labour, careful input management, and flexible tactics in the particular agricultural environment of the Trans-Giri region.

Production function analysis

To examine the input-output relationship in potato crop under different categories of farmers, regression analysis was carried out with the help of both linear and Cobb-Douglas production functions. The Cobb-Douglas form of the production function was found to be the best fit on the basis of both economic and statistical criteria and was used to study the effects of different factors on output, production elasticities, and resource use efficiency of the different factors. The regression coefficients, their standard errors and the value of adjusted

Table 5. Estimated regression coefficients of different factors influencing potato production

Sr. No.	Particulars	Regression coefficients	Small	Large	Overall
1	Constant	b_o	0.89 (0.31)	-3.94 (1.84)	-0.37 (0.34)
2	Seed (X_1)	b_1	0.41** (0.11)	1.91* (0.83)	0.27** (0.10)
3	FYM (X_2)	b_2	0.01 (0.08)	0.51 (0.27)	0.26** (0.06)
4	Fertilizer (X_3)	b_3	-0.33** (0.08)	0.14 (0.34)	0.05 (0.05)
5	Human Labour (X_4)	b_4	0.95** (0.21)	0.50** (0.18)	0.98** (0.11)
6	Area under potato crop (X_5)	b_5	0.71** (0.12)	1.21** (0.29)	0.36** (0.08)
7	Adjusted coefficients of multiple determination	R^2	0.70	0.78	0.71

Note: Figures in parentheses indicate standard errors
*Significant at 5 per cent level of significance, **Significant at 1 per cent level of significance

coefficients of multiple determinations (R^2) for potato production are given in Table 5. The production function explained approximately 71 per cent of the variation in potato production on the farm as a whole. On overall farm, the value of seed (X_1), human labour (X_4), Farm yard manure (X_2), and the size of the land holding under potato (X_5) had a significant and positive effect on potato production (Sharma *et. al.*, 2017). This implied that one per cent increase in quantity of the seed of potato and human labour resulted in about 0.27 and 0.98 per cent increase in production. This suggests that there was potential for boosting potato production as well as profit. Similar results were also reported by Lal and Sharma (2006). The area under potato crop (X_5) and FYM (X_2) had a positive and significant effect on the production of potatoes on an average farm. This indicates that the production of potatoes could be increased by putting more area under this crop. The table further shows that the fertilizer (X_3) exhibited significance negative effect on production in the case of small farms. One per cent increase in the use of fertilizer resulted in about a 0.33 per cent decrease in production. On small farms, seed (X_1), human labour (X_4) and potato crop area (X_5) all had a significant positive impact on potato production. More specifically, a one per cent increase in quantity of seed and area under potato production was expected to result in 0.41 and 0.71 per cent increase in total production, whereas on large farms, human labour (X_4) and area under potato crop (X_5) exhibited the most positive significant effect on the production of potatoes.

CONCLUSION

The total cost of cultivation of potatoes amounted to Rs. 2,14,929 per hectare on overall farms, with Rs. 2,19,390 per hectare on large farms and Rs. 2,12,698 per hectare on small farms. Total variable cost turned out to be Rs. 1,80,102 per hectare on large farms and Rs. 1,74,502 per hectare on small farms. The major component of the total variable cost was human labour which contributed about 61 per cent to the total variable cost and was comparatively higher on large farms. After human labour, next major component of cost was seed, which accounted for about 17 per cent of the total variable cost of cultivation on overall farms. The total variable cost accounted for 82 per cent of the total cost, while 18 per cent was due to the fixed cost (Rs. 38,560 per hectare). Both the total variable cost and the total fixed cost were found to be higher on large farms than on small farms. The output-input ratio was higher on small farms (1.84) than on large farms (1.71). In overall farms,

the output-input ratio was 1.80, which showed that one rupee invested in potato cultivation would return Rs. 1.80. Production function analysis indicated that seed, FYM, fertilizer, and area under potato cultivation were the most important factors affecting the production of potatoes.

COMPETING INTERESTS

We declare that we have no significant competing financial, professional, or personal interests that might have influenced the performance or presentation of the work described in this manuscript.

LITERATURE CITED

Akter Reshma and Akram Wasim (2020) Economics of potato production: A case study on the farmers of Munshiganj area of Bangladesh. *International Journal of Multidisciplinary Research,* **4**:81-89

Anonymous (2020-21) District Statistical Abstract of Sirmaur. Department of Economics and Statistics, Himachal Pradesh:1-68

Anonymous (2019-20) Economic Survey of Himachal Pradesh. Department of Economics and Statistics, Himachal Pradesh:1-172

Anonymous (2020-21) Economic Survey of India. Ministry of Finance, India:1-361

Anonymous (2019-20) Indian Horticulture Economic Survey of India. Ministry of Agriculture and Farmers Welfare, India:1-78.

Anonymous (2019-20) Statistical Year Book of Himachal Pradesh. Department of Economics and Statistics, Himachal Pradesh:1-27.

International Potato Centre (2022) Potato facts and figures. https://cipotato.org/potato/potato-facts-and-figures/. September 1st, 2022

Kumar A, Singh R, Singh PK, Yadav B and Choudhri HPS (2022) Economic aspects of potato cultivation in Sultanpur district of Uttar Pradesh. *Economic* Affairs. **67**:15-18.

Lal H and Sharma KD (2006) Economics of potato production in Lahaul Valley of Himachal Pradesh. *Potato Journal.* **33**:139-143.

Mohammadi A, Tabatabaeefar A, Shahin S, Rafiee S and Keyhani A (2018) Energy use and economic analysis of potato production in Iran: A case study of Ardabil province. *Energy Conversion and Management.* **49**:3566-3570.

Raghuvanshi A, Gauraha AK and Chandrakar MR (2018) Trends and economics of cultivation of potato in Chhattisgarh. *Journal of Pharmacognosy and Phytochemistry.* **7**:3150-3153.

Rana RK and Anwer MDE (2018) Potato production scenario and analysis of its total factor productivity in India. *Indian Journal of Agricultural Sciences.* **88**:1354–1361.

Sapkota SC, Rokaya PR, Acharya H and Uprety S (2019) Economic analysis of potato production in Achham district of Nepal. *International Journal of Horticulture and Agriculture.* **4**:1-9.

Sharma V, Lal H, Debnath U and Hatte V (2017) Economics of potato production in Kangra district of Himachal Pradesh. *International Journal of Current Microbiology and Applied Sciences.* **6**:123-129.

Singh AK (2010) Study of economics of production and marketing of potato in Uttar Pradesh with special reference to district Auraiya. Department of Agricultural Economics, Janta Mahavidyalya, Ajitmal Auraiya, Uttar Pradesh, India, Ph.D. thesis: 218p

Singh R, Singh B, Kumar B, Singh RK, Gupta J and Pal R (2020) Economics of potato cultivation in Jaunpur and Ghazipur district of eastern Uttar Pradesh. *Journal of Pharmacognosy and Phytochemistry.* **5**:306-309.

Sinha AK (2019) Economics of potato production in northern hills of Chhattisgarh. *Economic Affairs.* **64**:1-7.

Spooner DM and Hawkes JG (1990) The potato: Evolution, biodiversity and genetic resources. *American Journal of Potato Research.* **67**:733-735.

Srinivas T and Ramanathan S (2007) Economic analysis of Chinese potato cultivation in Tamil Nadu. *Journal of Root Crops.* **33**:57-61.

(MS Received : August 12, 2025; Accepted : October 24, 2025)