

International Journal of Statistics and Applied Mathematics

ISSN: 2456-1452
Maths 2023; SP-8(5): 322-324
© 2023 Stats & Maths
<https://www.mathsjournal.com>
Received: 15-06-2023
Accepted: 23-07-2023

Raj Kumar Yadav
M.Sc. Scholar, Department of
Agriculture Economics, Institute
of Agricultural Science
Bundelkand University Jhansi,
Uttar Pradesh, India

Dr. Shishir Kumar Singh
Assistant Professor, Department
of Agriculture Economics,
Institute of Agricultural Science
Bundelkand University Jhansi,
Uttar Pradesh, India

Dr. Naveen Kumar
Teaching Assistant, Institute of
Agricultural Science Bundelkand
University Jhansi, Uttar
Pradesh, India

Dr. Ajay Singh
Teaching Assistant, Institute of
Agricultural Science Bundelkand
University Jhansi, Uttar
Pradesh, India

Sunil Kumar Jakhar
M.Sc. Scholar, Teaching
Assistant, Institute of
Agricultural Science Bundelkand
University Jhansi, Uttar
Pradesh, India

Kalpesh Upadhaya
M.Sc. Scholar, Teaching
Assistant, Institute of
Agricultural Science Bundelkand
University Jhansi, Uttar
Pradesh, India

Corresponding Author:
Raj Kumar Yadav
M.Sc. Scholar, Department of
Agriculture Economics, Institute
of Agricultural Science
Bundelkand University Jhansi,
Uttar Pradesh, India

Work out the input output relationship of pea production in the study area

**Raj Kumar Yadav, Dr. Shishir Kumar Singh, Dr. Naveen Kumar, Dr.
Ajay Singh, Sunil Kumar Jakhar and Kalpesh Upadhaya**

Abstract

On sample farms, pea costs and returns per hectare have been calculated and are shown in this section. For the manufacture of peas, many cost approaches were employed. Gross income, net income, and family labour income per hectare were assessed and appraised. As a result, farm business income was used to measure farm profits. Large farms had the highest cost of cultivation per hectare (Rs. 57389.06), mostly because they invested the most in fixed capital compared to Medium and Marginal farms. The study also reveals that, on average, the principal component for which the highest cost was paid was determined to be human labour, at 15.60%, followed by machinery costs, manures and fertiliser, seed, irrigation, and plant protection, at 12.57, 4.83, 5.08, 3.74, and 2.20%, respectively.

Keywords: Economics of pea, input output relationship of pea production

Introduction

Among the many major industries that contribute to the total national product, agriculture plays a significant role in economic development. The foundation of the Indian economy is agriculture. The adoption of new agricultural technology by the farming community has enabled India's agriculture to transition from traditional to contemporary farming practices. In terms of net cropped area, India leads the world, followed by the US and China. With India's overall economic growth, agriculture's economic contribution to GDP is continuously shrinking. Nevertheless, agriculture is India's largest economic sector by population and contributes significantly to the country's overall socioeconomic structure. According to the Land Use Statistics 2016-17, the country's entire geographical area is 328.7 million hectares, of which the reported net sown area is 139.4 million hectares, and the gross cropped area is 200.2 million hectares, with a cropping intensity of 143.6%. Amounting to 42.4% of the entire geographical area, the net area seeded. There are 68.6 million hectares of net irrigated land. The term "Matar" can refer to either the small, spherical seed or the pod of the pea (*Pisum sativum* L.). The pea is a member of the Fabaceae family. After dry bean and chickpea, pea is the third-most significant pulse crop in the world, and after chickpea and lentil, pea is the third-most popular Rabi pulse in India. According to FAO Stats (2014), India is fourth in area (10.53%) and fifth in output (6.96%). In India, 6.32254 lakh square feet are used to raise pea's hectares with a yield of 1.63 tonnes per hectare and an estimated production of 10.34858 lakh tonnes in 2019-2020. In terms of field pea productivity, Rajasthan is in second place behind Haryana (10.90 tonnes/hectare) (DES, 2019-20). About 2019 tonnes of pea are produced in Rajasthan over 13593 hectares, with Jaipur having the maximum production-15819 tonnes- from an area of 8683 acre in the Rabi season of 2019-2020. (DES, 2019-20).

Methodology

The following cost elements were used to calculate the cost of cultivation and returns per hectare for pea crops for various size groups of farms.

Cost items (in Rs.)

1. Value of hired human labour.
2. Value of hired tractor.

3. Value of owned machine labour.
4. Value of hired machine labour.
5. Value of purchased seed.
6. Value of purchased farmyard manure.
7. Value of fertilizers and insecticides.
8. Irrigation charges.
9. Harvesting charges.
10. Land revenue
11. Interest on working capital.
12. Depreciation.
13. Miscellaneous expenses.
14. Rent paid for leased in land.
15. Interest on fixed capital.
16. Rental value of owned land and
17. Imputed value of family labour.

Cost B₂: Cost B₁ + rental value of owned land + rent paid for leased in land

Result and Discussion

Large farms had the highest cost of cultivation per hectare (Rs. 57389.06), mostly because they invested the most in fixed capital compared to Medium and Marginal farms. The study also reveals that, on average, the principal component for which the highest cost was paid was determined to be human labour, at 15.60%, followed by machinery costs, manures and fertiliser, seed, irrigation, and plant protection, at 12.57, 4.83, 5.08, 3.74, and 2.20%, respectively. Similar trends were seen across all types of sample farms as well. Calculated as a subtotal of 0.74, 45.02, 0.67, and 9.09 percent of total expenditures, respectively, the costs associated with interest on working capital, rental value of owned land, interest on fixed capital, and 12% managerial costs. Rent for owned land accounted for the largest portion of these costs, accounting for 45.02 percent of the total cost per hectare.

Cost A₁: Items 1 to 13
Cost A₂: Cost A₁ + Rent paid for leased in land
Cost B₁: Cost A₁ + Interest on fixed capital

Table 4: Per hectare costs of different inputs used in Pea production (Rs.)

S. No.	Particulars	Size group of farms			
		Marginal/ Small	Medium	Large	Overall average
1.	Human Labour	4730.05 (14.91)	5127.42 (15.49)	5800.61 (16.42)	5219.35 (15.60)
a.	Family Labour	3023.00 (9.53)	2119.44 (6.40)	1930.11 (5.46)	2357.51 (7.13)
b.	Hired Labour	1707.05 (5.38)	3007.98 (9.09)	3871.50 (10.96)	2862.17 (8.47)
2.	Tractor Charges/ Machinery Charges	3902.07 (12.30)	4203.20 (12.70)	4490.08 (12.71)	4198.45 (12.57)
3.	Seed	1589.05 (5.01)	1691.44 (5.11)	1813.00 (5.13)	1697.83 (5.08)
4.	Manure and fertilizer	1490.00 (4.70)	1606.72 (4.85)	1748.40 (4.95)	1615.04 (4.83)
5.	Irrigation	1080.09 (3.40)	1206.00 (3.64)	1476.10 (4.18)	1254.06 (3.74)
6.	Plant Protection	600.00 (1.90)	755.80 (2.28)	862.00 (2.44)	739.26 (2.20)
7.	Total working capital	10368.26 (32.68)	12471.14 (37.67)	14715.09 (41.66)	12518.16 (37.33)
8.	Interest on working capital	207.37 (0.65)	249.42 (0.75)	294.30 (0.83)	250.36 (0.74)
9.	Rental value of land	15000.00 (47.28)	15000.00 (45.31)	15000.00 (42.47)	15000.00 (45.02)
10.	Interest on fixed capital	243.71 (0.77)	253.71 (0.77)	170.69 (0.48)	222.70 (0.67)
11.	Sub total	43940.65 (90.91)	47692.27 (90.91)	52171.88 (90.91)	47943.89 (90.91)
12.	Managerial Cost@10% of sub- total	4394.06 (9.09)	4769.22 (9.09)	5217.18 (9.09)	4793.48 (9.09)
13.	Grand total	48334.71 (100)	52461.49 (100)	57389.06 (100)	52737.37 (100)

(Figure in parenthesis indicate percentage to the total cost)

Table 4.2: Measures of per- hectare cost and profits of pea (Rs.)

S. No.	Particulars	Size group of farms			
		Marginal /Small	Medium	Large	Overall average
1.	Cost A ₁ /A ₂	10575.63	12720.56	15009.39	12768.52
2.	Cost B ₁	10819.34	12974.27	15180.08	12220.26
3.	Cost B ₂	25819.34	27974.27	30180.08	27991.23
4.	Cost C ₁	13842.34	15093.71	17210.19	15382.08
5.	Cost C ₂	28842.34	30093.71	32110.19	30348.74
6.	Cost C ₃	31726.57	33103.08	35321.39	33383.68
7.	Yield q/ha.	5.94	6.20	6.69	6.27
8.	Gross Income	44550.00	46500.00	50175.00	47075
9.	Net return over cost C ₃	12823.43	13396.92	14853.61	13691.31
10.	Family Income	18730.66	18525.73	19994.92	19,083.77
11.	Farm Business Income	33974.37	33779.44	35165.61	34306.47
12.	Farm investment income	30951.37	31660.00	33135.50	31915.62
13.	Cost of production (q/ha.)	5341.17	5339.21	5279.73	5320.03
14.	Input-Output ratio				
a.	On the basis of cost A ₁	1:4.21	1:3.65	1:3.34	1:3.84
b.	On the basis of cost B ₁	1:4.11	1:3.58	1:3.30	1:3.78
c.	On the basis of cost B ₂	1:1.72	1:1.66	1:1.66	1:1.69
d.	On the basis of cost C ₁	1:3.21	1:3.08	1:2.91	1:3.13
e.	On the basis of cost C ₂	1:1.54	1:1.54	1:1.56	1:1.55
f.	On the basis of cost C ₃	1:1.40	1:1.40	1:1.42	1:1.41

Table 4.2 indicates that the computed value of Cost-C3 for the marginal, medium, and large size groups of farms, respectively, came to Rs. 48334.71, Rs. 524561.49, and Rs.

57389.06 along with the average value, which is Rs. 52737.37. Cost estimates for A₁, B₁, B₂, C₁, and C₂ per

hectare were calculated as follows: Rs. 12768.52, 12220.26, 27991.23, 15382.08, and 30348.74, respectively.

Conclusion

The estimated growth rates covered the years 2011–12 through 2021-22. The cumulative output of a crop is the outcome of that crop's area and productivity.

Acknowledgement

The Department of Economics at the Institute of Agricultural Science at Bundelkhand University (Jhansi), which provided the infrastructure and all other assistance required to carry out this study, is gratefully acknowledged by the authors.

Reference

1. Tiwari, *et al.*, Costs, returns and resource use efficiency of pea in Indore district of Madhya Pradesh. JNKVV-Research-Journal. 2012;7(3-4):214-217.
2. Khorne, *et al.*, Economics of Pea production in Amravati. International Research Journal of Agriculture Economics & Statistics. 2014;5(2):201-204.
3. Singh, *et al.*, Economic analysis of Pea crop in Jaipur district of Rajasthan. Agriculture Update. 2014;9(1):59-63.
4. Raut, *et al.*, Cost of cultivation of Pea in Sabarkantha district of Gujarat. International Research Journal of Agricultural Economics and Statistics. 2015;1(6):186-188.
5. Pawar, *et al.*, Cost, returns and profitability of Pea cultivation in Raigad district of Konkan region in Maharashtra. International Journal of Tropical Agriculture. 2016;1(6):0254-8755.
6. Das, Rout. Economic analysis of Pea Enterprise in Western Odisha. Indian Journal of Pure and Applied Biosciences. 2018;6(4):498-505.
7. Sahu, *et al.*, Cost of cultivation of pea and pea a crop in Fatehpur district of Uttar Pradesh. International Journal of Current Microbiology Application Science. 2018;7(08):3356-3361.
8. Rabadiya, *et al.*, Economic analysis of pea in Rajkot district. International Journal of Agriculture Science. 2019;11(6):8085-8088.
9. Shukla, *et al.*, Input use efficiency of pulse crop in Indian Agriculture. Indian Journal of Agricultural Economics. 1992;47(3):493.
10. Pote. Economics of black gram and Pea production in Latur district of Maharashtra. Unpublished. (Agri) thesis submitted to VNM.KV, Parbhani (MS); c2004.
11. Asmatoddin, *et al.*, Resource productivity and resource use efficiency in pulses production on medium farm in Marathwada. International Journal of Agricultural science. 2009;5(2):352-359.
12. Upev, *et al.*, Analysis of resource use efficiency among pea farmers in Gboko local government area of benue state of Nigeria, Global Journal of Agricultural Science. 2016;15(1):57.
13. Nidhi, Mishra. Dynamics of pulse production in Madhubani district of Bihar Unpublished M.Sc. (Agri) thesis, submitted to Indira Gandhi Krishi Vishwavidyalaya, Raipur; c2018.