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RESEARCH ARTICLE

ECONOMIC ANALYSIS OF VEGETABLE PEA PRODUCTION IN DEORIA DISTRICT OF UTTAR PRADESH

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ABSTRACT

The present study deals with the cost and return of vegetable pea production in Deoria district of Uttar Pradesh in the year of 2021-22 was selected purposively. A list of all 16 blocks was prepared on the basis area and production. One block namely deoria Sadar block was purposively selected for the study and 5 villages were selected on the basis of maximum coverage of area under vegetable pea crop. The farmers were selected randomly method. Thus, total sample size 60 farmers which comprised of marginal, small, medium and large farmer. The cost of vegetable pea cultivation was worked out to be Rs70575.70 per hectare. The gross income, net income, farm per hectare came to Rs.154252.60 and Rs. 77476.10 respectively. The B: C which indicates the profitability of investment was observed to be 1: 2.00 at the overall level.

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INTRODUCTION

Fresh vegetables play an important role for human health and economy of the nation. India is the second largest producer of vegetables in the world. India's production of vegetables currently stands at 126 million tonnes, making up for around 14 percent of world production (National Horticultural Board, Govt. of India, 2010). The suitable agro-climatic condition has enormous potential for wide variety of vegetable production in Uttar Pradesh. The present share of Uttar Pradesh in total horticultural production of the country is approximately 26 percent. Uttar Pradesh ranks 2nd in vegetables production among all states, The major vegetables grown in the Uttar Pradesh are potato, peas, chilli, okra, tomato, brinjal (egg plant), cauliflower, cabbage, spinach, radish, carrot, turnip, onion and cucurbits, etc. (State Horticulture Mission, Uttar Pradesh, 2011). Pea is an important cool-season, frost-hardy, nutritious leguminous vegetable that is widely cultivated for its green pods throughout the world. As a cool-season crop, it is extensively grown in temperate zones. It is also referred as garden pea and field pea. Pea is a quick growing, an annual herbaceous vine that requires the trellis to support growth. It is a rich source of protein (25 percent), amino acids, sugars (12 percent), carbohydrate, vitamin A and C, calcium

and phosphorus, apart from having a small quantity of iron. Peas being very rich in protein can use for vegetable purposes. It is used as a vegetable or in soup, canned frozen or dehydrate. It is cooked as a vegetable along or with potatoes. Split grains of pea are widely used for dal. Pea straw is a nutritious fodder. India is the second largest producer of pea after China in the world. It is also used as a vegetable in many other countries such as Canada, Russia, United States, France and Egypt (Food and Agriculture Organization 2012). Major pea growing states in India are Bihar, Haryana, Punjab, Himachal Pradesh, Orissa and Karnataka. Uttarakhand is also emerging as vegetable pea growing state as farmers are taking three crops in a year. Green peas contain a high percentage of digestible sugars, minerals, vitamin A, B and C and essential amino acids. Being a leguminous crop, it enriches the soil by fixing atmospheric nitrogen in the soil and also provides an effective cover to the land and thus restricts soil erosion. In India, pea is cultivated over an area of about 540.48 thousand hectares with a production of 5422.14 thousand metric tonnes, (Anonymous, 2018). In Uttar Pradesh, it is cultivated over an area of about 540 hectares with an annual production of 5422 metric tones (NHB, 2017). District Deoria is one of the largest districts of Uttar Pradesh with a total geographical area of 680961 hectares out of which 79937 hectares is net sown area. The total production was accounted 7523 tonnes and total area was 1171.7 ha Net area under green pea production with productivity 66.34 qt/h. (2017-18). The green pea is important crop source of income of the farmers of the study area of Deoria District because the geographical and soil condition favour the growing of vegetables and provide

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sufficient income and employment to the cultivators of the study area. The results showed that green pea production on sample farm was 105910.97 Rs/ha which was increased as the farm size increased. The average net income was found 94256.26 Rs/ha and in case of small, medium and large farmer was 99629.17 Rs/ha, 95660.05 Rs/ha and 87479.58 Rs/ha respectively. Average input-output ratio was 1:1.80 per cent. Input-output ratio of green pea varied from 1:1.90 per cent to 1:1.70 per cent (Gurjar *et al.* 2018). The cost of cultivation of pea in case of marginal farms was higher as compared to different farm size category. The total yield of pea production was 72.16 quintals per hectare. The total returns and net returns from pea production were ` 144324.32 and ` 59624.95 per hectare, respectively (Singh *et al.* 2020). The findings of the study revealed that overall farmers of the study area are getting good profits from vegetable production (Rashmi *et al.* 2020).

MATERIALS AND METHODS

The Deoria district was selected purposely. A list of all 16 blocks was prepared on the basis of vegetable pea growing area. One block namely deoria Sadar block was purposively selected for the study and 5 villages were selected on the basis of maximum coverage of area under vegetable pea crop.

prices used were that at which the vegetable pea cultivators had actually sold their output or procured the input.

Cost concepts as per the CACP classification: The cost concepts approach to farm casting is widely used in India. To work out the cost of cultivation standard method of cost cultivation employed by commission for agricultural costs and prices (CACP), directorate of economics and statistics, government of India was adopted. These include Cost A₁, Cost A₂, Cost B₁ Cost B₂ Cost C₁, Cost C₂, and Cost C₃. Various costs have been worked out by applying following method:

Cost A₁: all actual expenses in cash and kind incurred in production. Cost A₁ consists of following 14 costs items:

1. Value of hired human labour (permanent & casual).
2. Value of owned bullock labour.
3. Value of hired bullock labour.
4. Value of owned machinelabour.
5. Hired machinery charges
6. Value of fertilizers.
7. Value of manure (produced farm and purchased).
8. Value of seed (both farm- produced and purchased).
9. Value of insecticides, pesticides and fungicides.
10. Irrigation charges (both owned and hired tube wells pumping

Table 1. Per hectare cost input of factors in Vegetable Pea cultivation (Rs. /ha)

Sl. No.	Cost Items	Marginal (0-1ha)	Small (1-2ha)	Medium (2-4ha)	Large (4ha& above)	Overall Average
A. Operational cost						
1.	Hired labour	6553.03 (09.79)	6932.52 (10.05)	7498.83 (10.52)	9604.2 (12.78)	7647.14 (10.83)
2.	Family labour	12137.61 (18.13)	11445.35 (16.59)	9952.58 (13.96)	8560.4 (11.39)	10523.99 (14.91)
3.	Seeds	8670.92 (12.95)	8976.23 (13.01)	9819.16 (13.77)	10469.8 (13.93)	9484.02 (13.48)
4.	Manure	2148.53 (03.21)	2300.64 (03.33)	2642.25 (03.70)	2825.2 (03.75)	2479.15 (03.51)
5.	Fertilizers	4860.65 (07.26)	5076.23 (07.36)	5408.83 (07.58)	5822.2 (07.74)	5291.97 (07.49)
6.	Plant protection	5865.5 (08.76)	6270.46 (09.09)	6576.16 (09.22)	6690.4 (08.90)	6350.63 (08.99)
7.	Irrigation charges	2951.84 (04.41)	3373.17 (04.89)	3734.66 (05.24)	3999.8 (05.32)	3514.86 (04.98)
8.	Machine labour	5670.57 (08.47)	6002.82 (08.70)	6493.33 (09.11)	7726.4 (10.28)	6473.28 (09.17)
9.	Interest on working capital	1204.73 (01.80)	1242.19 (01.80)	1285.29 (01.80)	1373.38 (01.82)	1277.14 (01.80)
z	Total operational cost	50066.38 (74.80)	51619.61 (74.84)	53411.09 (74.94)	57071.78 (75.95)	53042.22 (75.15)
B. Fixed costs/overhead cost						
1.	Land revenue	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)	00 (00.00)
2.	Depreciation	1456.11 (02.17)	1930.29 (02.79)	2424.66 (03.40)	2635.2 (03.50)	2111.56 (02.99)
3.	Rental value of owned land	15000 (22.41)	15000 (21.74)	15000 (21.04)	15000 (19.96)	15000 (21.25)
4.	Interest on fixed capital	405.76 (00.00)	417.45 (00.60)	429.64 (00.60)	434.84 (00.57)	421.92 (00.59)
	Total overhead cost	16861.87 (25.19)	17347.74 (25.15)	17854.3 (25.05)	18070.04 (24.04)	17533.48 (24.84)
	Total cost	66928.25 (100)	68967.35 (100)	71265.39 (100)	75141.82 (100)	70575.70 (100)

Note: figures in the parentheses indicate percentages to total

Form the selected village the list of farmers growing vegetable pea was prepared and further classified in four size groups based on there size of holdings marginal farmer (having <1 ha) small farmer (having 1-2 ha) medium farmer (having 2-4 ha) and, large farmer (having > 4 ha) from each size group farmers were selected from each village by simple random sampling method. Thus, total sample size 60 farmers which comprised of marginal, small, medium and large farmer. After the preparation of the schedules, data were collected from vegetable pea cultivators by personal interview. The information regarding the vegetable pea cultivators was collected from. The input and output

11. Canal water charges.
12. Land revenue, cesses and other taxes.
13. Depreciation on farm implements and machinery (both bullock drawn & worked with human labour, farm building and farm machinery).
14. Interest on the working capital.

Cost A₂: Cost A₁ + Actual rent paid for leased in land

Cost B₁: Cost A₁ + Interest on value of owned fixed capital assets (excluding land)

Table 2. Cost of cultivation as per the CACP approach (Rs. /ha.)

Sl. No.	Costs	Marginal	Small	Medium	Large	Overall
1.	Cost A ₁	39381.90	42104.90	45883.20	50770.20	44535.05
2.	Cost A ₂	39381.90	42104.90	45883.20	50770.20	44535.05
3.	Cost B ₁	39787.70	42522.40	46312.90	51195.70	44954.68
4.	Cost B ₂	54787.70	57522.40	61312.90	66195.70	59954.68
5.	Cost C ₁	51925.30	53967.70	56265.40	59756.10	55478.63
6.	Cost C ₂	66928.25	68967.35	71265.39	75141.82	70575.70
7.	Cost C ₃	73617.80	72864.50	78392.00	82231.80	76776.53

Table 3. Returns from Vegetable Pea production for different categories of farmers

Sl. No.	Particulars	Marginal (0-1ha)	Small (1-2ha)	Medium (2-4ha)	Large (4ha&above)	Overall Average
1.	Production (Q./ha)	64.54	65.82	67.84	68.26	66.61
2.	Price (Rs. /Q.)	2200	2285	2325	2445	2313.75
3.	Gross income (Rs./ha)	141988	150398.7	157728	166895.7	154252.60
4.	Net income Rs. /ha	68370.3	77534.2	79336	84663.90	77476.10
5.	Cost of production (Rs./Q)	1140.65	1107.02	1155.54	1204.68	1151.97
6.	B:C ratio(BCR)	1.92	2.06	2.01	2.02	2.00

Note: figures in the parentheses indicate percentages to the total cost (C₃)

Cost B₂: Cost B₁ + rental value of owned land

Cost C₁: Cost B₁ + imputed value of family labour

Cost C₂: Cost B₂ + imputed value of family labour

Cost C₃: Cost C₂ + 10 percent of cost C₂ to account for managerial function perform by farmer.

Returns per rupee of investment: This is calculated by dividing the gross returns with total cost.

Gross income: Gross income pertains to the total value of the vegetable pea production during the year valued at the average prices of the year.

Net income: Net income was worked out on by deducting cost C₂ gross income.

Benefit-cost ratio (BCR): Benefit – cost ratio is obtained by ratio of total gross return to the total cost.

Per hectare cost of input factors in vegetable pea production: The table: 1 indicates that overall cost of vegetable pea cultivation was worked out to be Rs70575.70 per hectare. Which was highest for large (Rs.75141.82) size of holding followed by medium (Rs. 71265.39), small (Rs. 68967.35) marginal (Rs. 66928.25) size of holdings. Per hectare operational cost at overall level was Rs. 53042.22(75.15 percent of the total cost) and per hectare fixed/ overhead cost came out to be Rs.17533.48 (24.84 percent of the total cost). Input wise analysis showed that overall human labour was highest expenditure among various components of operational cost with 25.74 percent (Rs.18171.13) share of total cost. The overall major cost component of cultivation of vegetable pea crop was total cost of rental value of owned land Rs. 15000.00 (21.25 percent) followed by seed Rs.9484.02 (13.48 percent) machine labour Rs. 4259.27 (4.98 percent), fertilizers Rs.5291.97 (7.49 percent), irrigation charges Rs.3514.86 (8.22 percent).

Costs as per the CACP classification: Table 2: show that the operational cost known as cost A₁/A₂ accounted for Rs.39381.90 in marginal size, followed by Rs. 42104.90 in small size Rs. 45883.20 in medium size and Rs. 50770.20 in large farm size. Cost B₁ amounted for Rs. 39787.70 in marginal size Rs. 42522.40 in small size, Rs. 46312.90 in medium and Rs. 51195.70 in large size group. The cost C₁ and C₂ was found maximum in large size farm (Rs. 59756.10 and Rs. 75141.82). Cost C₃ known as total cost per hectare accounted for Rs. 73617.80, Rs. 72864.50, Rs. 78392.00 and Rs. 82231.80 marginal, small, medium and large size groups respectively.

Returns from vegetable pea production: The production and value of output per hectare of selected farmers have been shown in table 3. overall production per hectare of vegetable pea crop came to 66.61

quintals, it was observed higher production was accrued to be large farmers (68.26 quintals) followed by medium (67.84 quintals), small (65.82quintals) and marginal (64.54quintals) farmers. The overall value of gross income and net income per hectare came to Rs154252.60 and Rs. 77476.10, respectively. The gross income was highest for the large farmers (Rs.166895.70) followed by medium (Rs.157728.00) small (Rs.150398.70) and marginal (Rs.141988.00) farmers. The net income on vegetable pea crop was highest for the large farmers (Rs.84663.90) followed by medium (Rs.79336.00) small (Rs.77534.20) and marginal (Rs.68370.30) farmers. The B: C which indicates the profitability of investment was observed to be 2.00 at the overall level. Among the size of holding, the B: C ratio was highest in large size group (2.02) compared to medium (2.01), small (2.06) and marginal (1.92) farmers.

CONCLUSION

The cost of cultivation shown increasing trend from marginal to large farmer. It due to fact that large size of holding farmer could incur more expenditure on modern farm input like quality of hired labor, fertilizers, machine labor, irrigation, and seed etc. All costs were comparatively higher for large size farm followed by medium, small, marginal farmers. The reasons for increasing cost as the farm size increases were due to marginal farmers use more family labor in comparison to large farmers because they were comparatively poorer than large farmers and another reason for observation may be due to use of local seed used by marginal farmers as compared to large farmers. This may be also due to use of more plant protection measures and machinery labor by large size farmers than marginal, small, medium size farmers. . It was total production per hectare of vegetable pea crop came to 66.61 quintals. . The B: C ratio indicates that the cultivation of vegetable pea was more profitable in small size farmer.

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