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## Okra: A study on cost and profitability analysis in Deoria district of Uttar Pradesh

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**Abstract**

The study was undertaken to assess the cost and profitability measures of the okra growers in Deoria district of Uttar Pradesh. Overall average size of holding of the farmers was estimated 1.34 ha. Only marginal, small and medium farmers were found in the study area with average size of land holding of 0.45 ha, 1.46 ha and 2.94 ha, respectively. The study exhibited that cost of cultivation and gross return were more on medium farms i.e. Rs. 82344.92 and Rs. 190905.00 as compared to small Rs. 75917.95 and Rs. 182325.00 and marginal farms Rs. 70274.92 and Rs. 178035.00. While net income and cost-benefit ratio were more on marginal farms i.e. Rs. 100732.59 and 1:2.30 in comparison with small farms Rs. 98815.26 and 1:2.18 and medium farms Rs. 100325.59 and 1:2.11. The result of the study revealed that the okra cultivation was more profitable to marginal farms. Okra cultivation revealed that this crop is suitable for doubling the income of the farmers of the study area.

**Keywords:** okra, cost of cultivation, profitability, cost-benefit ratio

**Introduction**

Vegetables are so important in human diet that a meal without vegetable is supposed to be incomplete. India is the second largest producer of vegetables in the world and it accounts for about 15 percent of the world's production of vegetables. The production level is 167.05 million tonnes from 9.5 million hectares of land. Though the vegetable requirement is 300 grams vegetables per capita per day as recommended by dietician, we are getting about 1/9<sup>th</sup> of that requirement only. India is blessed with diverse climatic conditions and hence, it grows largest number of vegetables. Therefore, a planned development in vegetable production will not only improve the nutritional requirement by providing balanced diet which is essential to keep people healthy but can also enhance the income level of the cultivators. Vegetable production being labour intensive can substantially provide employment avenues too.

In the vegetable kingdom, *malvaceous* vegetable crops are of pivotal importance. In the *malvaceous* vegetable group, the okra is considerably an important vegetable crop cultivated widely across seasons and space. This is a warm season crop grown widely in India and can be fitted very well into a number of crop rotations of vegetable and non-vegetable crops. It has large potential of yield, income and employment generation per unit of area and time. Per hectare productivity of okra in India and all regions of U.P. as well as are low compared to the developed and a number of the developing countries. This is attributed mainly due to the unbalanced adoption of the different qualitative and quantitative components of the recommended package of technology (Theke, 2010) [8].

Okra (*Abelmoschus esculantus* L.) known in many English-speaking countries as Lady's finger, bhindi in India, krajibkheaw in Thailand, okra plant, ochro, okaro, quingombo, quingumbo, gombo, kopi, arab, bendi & bhindi in South East Asia. However, in Middle East it is known as bamia, bamyia or bamieh and gumbo in Southern Portuguese and Anyala. Okra (*Abelmoschus esculantus* L.) is the only vegetable crop of significance in the malvaceae family and is very popular in the Indo-Pak sub-continent. In India, its rank number one in its consumption but its original home is Ethiopia and Sudan, the North Eastern African countries. It is one of the oldest cultivated crop and presently commercially grown in many countries, viz India, Japan, Turkey, Iran, Western Africa, Yugoslavia, Bangladesh, Afghanistan, Pakistan, Myanmar, Malaysia, Thailand, Brazil, Ethiopia and Cyprus. Okra can be grown on a large commercial farm as a garden crop.

It is a tropical to sub-tropical crop and sensitive to frost, low temperature, water logging and drought conditions and the cultivars from different countries have certain distinguishing characteristics specific to the country to which they belong (Siesmonsma, 1982) [7]. Okra is known for valuable food ingredients, vitamins, protein and carbohydrate for building up and repairing the body tissue as well as prevention of diseases (Semon *et al.* 2005) [6].

The dried seed is used to prepare vegetable curds, or roasted and ground to be used as a coffee additive or substitute; leaves are considered good cattle feed, useful in confectionery and to glaze certain papers (Akorda, 2010) <sup>[1]</sup>. Also, it serves as a source of income to its producers, labourers and marketers (Alimi, 2004) <sup>[2]</sup>.

In India area, production and productivity of okra in the year 2015-16 were reported as 511 thousand ha, 5849 thousand MT and 11.45 MT/ha respectively. In U.P. okra acreage under okra cultivation was reported as 22.50 thousand ha with a production of 301.21 thousand MT and productivity 13.39 MT/ha in the year 2015-16 (Horticultural Statistics at a glance 2017). Uttar Pradesh ranked first in vegetable production with a share of 15.1% of the total vegetable production of the nation.

Okra is short duration and high yielding vegetable crop, suitable for marginal and small farmers. Deoria is primarily an agrarian district with an area under cultivation is 1.98 lakh ha with cropping intensity of 162.1% and 1.77 lakh ha area is under irrigation. Agro-climatic conditions of the district are suitable for commercial cultivation of horticultural crops. Okra is one of the important vegetable grown in the district and it has also economic and nutritional importance. Hence, Deoria district was purposively selected for the investigation to work out "Okra: Cost and profitability analysis in Deoria district of U.P. Present study was carried out with objectives *viz.*

1. To work out cost of cultivation of okra and
2. To work out various profit measures of okra cultivation.

### Methodology

The investigation was carried out in district Deoria during 2015-16. Multistage stratified purposive cum random sampling method was applied to select district, block, villages and respondents. In the first stage Deoria district of Uttar Pradesh was selected purposively because of huge volume of vegetable production takes place. There are 16 blocks in Deoria district. Out of 16 blocks of Deoria district, one block, namely, Desahi Deoria was selected purposively because majority of farmers of this block are growing okra. A list of

all the villages of this block was prepared along with their area and production under vegetables, five villages *viz.* Barawa Meer Chhappar, Desahi Deoria, Shampur, Pipara Madan Gopal and Shishwa were selected purposively where maximum number of farmers cultivated okra. A separate list of okra growers of selected villages was prepared along-with their size of holding obtained from record (Khasara and Khatauni) available at Tehsil level and further it was stratified into three categories *i.e.* marginal (<1ha), small (1-2ha) and medium (2-4ha). Ultimately, 100 respondents were selected following the proportionate random sampling technique. Primary data were collected by well prepared schedule by personal interview with selected vegetable growers. Secondary data were compiled from various published sources *viz.* report from various offices of district and block. Tabular analysis was carried out to arrive at the meaningful conclusion.

### Results and Discussion

#### Cost of cultivation of okra

The per hectare cost on various input factors in okra cultivation are worked out. The details of input costs are given in Table 1. Perusal of the table indicated that cost of cultivation of okra was highest on medium farms (Rs. 82344.92) followed by small farms (Rs. 75917.95) and marginal farms (Rs. 70274.92) along with overall average (Rs. 74833.27) per hectare. It is concluded from the table that per hectare cost of cultivation of okra increases with an increase in farm size.

Family labour was assessed maximum on marginal farms 12.88% followed by small farms 10.27% and medium farms 5.40% along with overall average 10.23%. Hired labour cost was obtained maximum on medium farms 13.66% followed by small farms 8.49% and marginal farms 6.40% along with overall average 8.81%.

The major component of the costs were irrigation charges 27.69%, human labour 19.04%, manures and fertilizers 11.47%, tractor power 8.59% and seed cost 7.64% respectively, of the total cost of cultivation.

**Table 1:** Per hectare cost of cultivation of okra (Rs/ha)

| Sl. No. | Particulars                     | Size group of sample farms |                   |                   | Overall average   |
|---------|---------------------------------|----------------------------|-------------------|-------------------|-------------------|
|         |                                 | Marginal                   | Small             | Medium            |                   |
| 1.      | Family Labour                   | 9050.00 (12.88)            | 7800.00 (10.27)   | 4450.00 (5.40)    | 7655.00 (10.23)   |
| 2.      | Hired Labour                    | 4500.00 (6.40)             | 6450.00 (8.49)    | 11250.00 (13.66)  | 6591.00 (8.81)    |
| 3.      | Total Human Labour              | 13550.00 (19.28)           | 14250.00 (18.77)  | 15700.00 (19.07)  | 14246.00 (19.04)  |
| 4.      | Tractor power                   | 6647.00 (9.46)             | 6313.00 (8.31)    | 6217.00 (7.55)    | 6434.08 (8.59)    |
| 5.      | Seed cost                       | 5250.00 (7.47)             | 5400.00 (7.11)    | 7311.00 (8.88)    | 5719.20 (7.64)    |
| 6.      | Manures & fertilizers           | 7580.00 (10.79)            | 8700.00 (11.46)   | 10480.00 (12.73)  | 8585.60 (11.47)   |
| 7.      | Irrigation charges              | 18360.00 (26.12)           | 22131.00 (29.15)  | 23009.00 (27.94)  | 20722.78 (27.69)  |
| 8.      | Plant protection                | 1250.00 (1.78)             | 1430.00 (1.88)    | 1480.00 (1.79)    | 1364.40 (1.82)    |
| 9.      | Interest of working capital     | 350.92 (0.49)              | 388.16 (0.51)     | 427.98 (0.52)     | 380.48 (0.51)     |
| 10.     | Rental value on owned land      | 14000.00 (19.92)           | 14000.00 (18.44)  | 14000.00 (17.00)  | 14000.00 (18.71)  |
| 11.     | Interest on owned Fixed capital | 3287.00 (4.68)             | 3305.79 (4.35)    | 3719.94 (4.52)    | 3380.73 (4.52)    |
| 12.     | Grand total                     | 70274.92 (100.00)          | 75917.95 (100.00) | 82344.92 (100.00) | 74833.27 (100.00) |

Figure in parentheses indicates the percentage.

### Costs and returns from okra cultivation

Per hectare costs and returns for different size group of farms are presented in Table- 2. It was observed from the table that maximum overall average costs were cost C<sub>3</sub> (Rs. 82316.59/ha) followed by cost C<sub>2</sub> (Rs. 74833.27/ha), cost B<sub>2</sub> (Rs. 67178.27/ha), cost C<sub>1</sub> (Rs. 60833.27/ha), cost B<sub>1</sub> (Rs. 53178.27/ha) and cost A<sub>1</sub>/A<sub>2</sub> (Rs. 49797.52/ha), respectively. Cost C<sub>3</sub> was observed maximum on medium farms (Rs. 90579.41/ha) followed by small (Rs. 83509.74/ha) and

marginal farms (Rs. 77302.41/ha) with overall average Rs. 82316.59/ha. In the study area gross income was estimated maximum on medium farms (Rs. 190905.00/ha) followed by small farms (Rs. 182325.00/ha) and marginal farms (Rs. 178035.00/ha) along with overall average Rs. 182239.20/ha. With respect to net income, it was found maximum on marginal farms (Rs. 100732.59/ha) followed by medium farms (Rs. 100325.59/ha) and small farms (Rs. 98815.26/ha) along with overall average (Rs. 107405.90/ha).

With respect to family labour income, it is evident that it was maximum on marginal farms Rs.116810.08 followed by small farms Rs. 114207.05 and medium farms Rs. 113010.08 along with overall average Rs. 115060.90. Farm business income was also maximum on marginal farms Rs. 134097.08 followed by small farms Rs.131512.84 and medium farms Rs. 130730.02 along with overall average Rs. 132441.70. Cost of production was maximum on medium farms Rs. 925.22 followed by small farms Rs. 893.15 and marginal farms Rs.846.68 along with overall average Rs. 880.03.

It is concluded that there is direct relationship between size group of farms and cost  $C_3$ , gross income, farm investment income and cost of production while family labour income and farm business income show inverse relationship with size group of farms. This result is in line with Maurya *et al.* (2012) [5].

### Input-output ratio

Input-output ratio for different size group of farms are presented in table-3. On an average input-output ratio regarding costs  $A_1/A_2$ ,  $B_1$ ,  $B_2$ ,  $C_1$ ,  $C_2$  and  $C_3$  were recorded 1:3.66, 1:3.43, 1:2.71, 1:2.99, 1:2.43 and 1:2.21, respectively. Input-output ratio on the basis of cost  $C_3$  was estimated and observed maximum 1:2.30 on marginal farms followed by small 1:2.18 and medium farms 1:2.11. Overall average input-output ratio was observed 1:2.21 in the study area. It is concluded that okra cultivation is lucrative crop for Deoria district of U.P. as cultivation of this crop provided 2.21 times returns over investment. In the study area, inverse relationship between size group of farms and input-output ratio was observed. Various profit measures and input out ratios indicated that okra cultivation is suitable for doubling the income of the farmers in the study area.

**Table 2:** Measures of costs and returns of okra (Rs./ha)

| S. No. | Items                      | Size of groups |           |           | Overall average |
|--------|----------------------------|----------------|-----------|-----------|-----------------|
|        | Costs                      | Marginal       | Small     | Medium    |                 |
| 1.     | Cost $A_1/A_2$             | 43937.92       | 50812.16  | 60174.98  | 49797.52        |
| 2.     | Cost $B_1$                 | 47224.92       | 54117.95  | 63894.92  | 53178.27        |
| 3.     | Cost $B_2$                 | 61224.92       | 68117.95  | 77894.92  | 67178.27        |
| 4.     | Cost $C_1$                 | 56274.92       | 61917.95  | 68344.92  | 60833.27        |
| 5.     | Cost $C_2$                 | 70274.92       | 75917.95  | 82344.92  | 74833.27        |
| 6.     | Cost $C_3$                 | 77302.41       | 83509.74  | 90579.41  | 82316.59        |
| 7.     | Yield in q/ha              | 83.00          | 85.00     | 89.00     | 84.96           |
| 8.     | Rate in Rs./q              | 2145.00        | 2145.00   | 2145.00   | 2145.00         |
| 9.     | Gross income               | 178035.00      | 182325.00 | 190905.00 | 182239.20       |
| 10.    | Net income                 | 100732.59      | 98815.26  | 100325.59 | 107405.90       |
| 11.    | Family labour income       | 116810.08      | 114207.05 | 113010.08 | 115060.90       |
| 12.    | Farm investment income     | 125047.08      | 123712.84 | 126280.02 | 124786.70       |
| 13.    | Farm business income       | 134097.08      | 131512.84 | 130730.02 | 132441.70       |
| 14.    | Cost of production (Rs./q) | 846.68         | 893.15    | 925.22    | 880.03          |

**Table 3:** Input-Output ratio

| S. No. | Input-output ratio:- | Marginal | Small  | Medium | Overall average |
|--------|----------------------|----------|--------|--------|-----------------|
| i.     | $A_1/A_2$ basis      | 1:4.05   | 1:3.59 | 1:3.17 | 1:3.66          |
| ii.    | $B_1$ basis          | 1:3.77   | 1:3.37 | 1:2.99 | 1:3.43          |
| iii.   | $B_2$ basis          | 1:2.91   | 1:2.68 | 1:2.45 | 1:2.71          |
| iv.    | $C_1$ basis          | 1:3.16   | 1:2.94 | 1:2.79 | 1:2.99          |
| v.     | $C_2$ basis          | 1:2.53   | 1:2.40 | 1:2.32 | 1:2.43          |
| vi.    | $C_3$ basis          | 1:2.30   | 1:2.18 | 1:2.11 | 1:2.21          |

### Conclusion

From the above discussion it may be concluded that per hectare cost of cultivation of okra was highest on medium farms Rs. 82344.92 followed by small Rs. 75917.95 and marginal Rs. 70274.92 along with overall average Rs. 74833.27. Major cost components of okra cultivation were found irrigation charges 27.69 percent and human labour 19.04 percent. It was also observed that cultivation's cost increases with increase in farm size.

Yield was estimated maximum in case of medium farmers 89q/ha followed by small (85q/ha) and marginal (83q/ha). Gross income per hectare came to be Rs. 182239.20 on overall average basis which was minimum on marginal farms i.e. Rs. 178035.00, it increases with increase in farms size and found to Rs. 182325.00 and Rs. 190905.00 on small and medium farms. It may be concluded that per hectare costs of cultivation and gross income have positive relationship with size of farms.

While net income and input-output ratio showed inverse relationship with size group of farms. This relationship of costs and income with land holding shows better utilization of

other input factor in order to get the maximum possible farm income in okra cultivation. Okra cultivation is suitable for doubling the income of the farmers in the study area.

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