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## Comparative economics of production of important vegetables in Surat district

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### ABSTRACT

The present investigation was intended to depict the picture of brinjal and cauliflower crop enterprises in Chorayasi Taluka of Surat district. The study was conducted with a view to examine the resource use structure, costs and returns structure of vegetable production. The investigation was based on the cross sectional farm level data obtained by survey method from the sample of 60 farmers, 30 each for brinjal and cauliflower from the selected five villages of Chorayasi Taluka of Surat district. The data worked out the estimates of per hectare resource use patterns, costs, returns and profitability. The proportion of workers engaged in agriculture was high, particularly in Chorayasi Taluka. The per hectare use level of important inputs viz., human labour, bullock labour, seedling, fertilizers were relatively more in the production of brinjal as compared to cauliflower crop. The highest per hectare net return obtained from brinjal crop indicated that brinjal cultivation was profitable than the cauliflower crop.

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**Key words :** Resource use pattern, Costs, Returns, Profitability, Brinjal, Cauliflower, Production

### INTRODUCTION

Vegetables serve as one of the vehicles to move away from subsistence farming towards business oriented farming that improves income, nutrition and the quality of lives in rural communities. In recent years, the growth of population is over 1000 millions, as well as rising demand for agricultural products from the agro-based industries with the onset of new economic policy in the country. Now-a-days vegetable based industries are emerging as powerful engines for economic growth. Today, the trend is changed. The economical development is enhanced by cereal-based production with a vegetable as well as milk products, fruits crop production. Around the assured markets, many farmers are raising 3 to 4 crops in year only by including vegetable crops in the cropping pattern. Vegetables can be taken throughout the year and as such they provide continuous flow of income to the farmers. As the labour requirement of vegetable crops is more and continuous as compared to other crops, they provide employment to the labours throughout the year. The available resources if properly diploid, not only help in food

sufficiency drive but also help to earn foreign exchange by exporting fresh vegetables and vegetable products. The area of vegetables in Surat district was 6.90 thousand hectares and the production was 83.33 thousand M.T. in the year 1998-99. The area and production has risen to 19.64 thousand hectares and 257.73 thousand M.T., respectively in the year 2002-03. Out of this, the area of study crop brinjal was 2,100 ha and production was 31,500 M.T. and the area of cauliflower was 430 ha and production was 9,590 M.T. in the year 1998-99. The area and production of brinjal was raised to 4,444 ha. and 79,992 M.T., respectively in the year 2002-03 and cauliflower was raised to 546 ha and 9,555 M.T. in the same year (Anonymous, 2003).

### MATERIALS AND METHODS

The main aspects of the present investigation were to study the resource use, costs and returns and relative profitability in the production of important vegetable crop enterprises. Chorayasi Taluka of Surat district is the prominent taluka growing vegetables. The important

vegetables such as brinjal and cauliflower were selected for the study. Five villages were randomly selected on the basis of probability proportion to the area under vegetables *viz.*, brinjal and cauliflower under study. The villages were Khubhariya, Saniya-Hemad, Mota Varachha, Devadh and Pal. Six cultivators each growing brinjal and cauliflower from each of selected villages were selected by simple random sampling. Thus, the total sample comprised of 60 vegetable growers, thirty each for brinjal and cauliflower. The data were analyzed with the help of standard cost concepts normally used in farm management studies. The simple tabular analysis was done to work out the various costs, gross returns and input-output ratio for the crops. The estimate of costs, returns and profit were estimated to study their economics. The cost of cultivation of crops was worked out by using cost concepts *viz.*, Cost A, Cost B, Cost  $C_1$  and Cost  $C_2$ . These costs included the following items.

**Cost A or paid out cost:**

- Wages on hired labour
- Charges of owned and hired bullock labour
- Value of seed/seedlings
- Value of manure (farm produced and purchased)
- Value of fertilizers
- Expenditure on irrigation
- Expenditure on plant protection measures
- Miscellaneous expenditure
- Interest on working capital
- Depreciation

**Cost B:**

This cost consisted of cost A + Rental value of land + Interest on fixed capital.

**Cost  $C_1$ :**

It included cost B + Imputed value of family labour.

**Cost  $C_2$ :**

It included cost  $C_1$  + 10 % managerial charges (10 % of cost  $C_1$ ).

The analysis of cost and returns of brinjal and cauliflower crops gave an idea about the profitability of these crop enterprises in the area under study. Per hectare cost of production of brinjal and cauliflower was worked out with the help of bulk-line cost concept. The bulk-line cost concept was based on the cost  $C_2$  concept. It was related with the average cost of production of 85 per cent of the total output and area. This was estimated with the help of graphic method. The majority of the farmers would be covered by this concept.

## RESULTS AND DISCUSSION

The profitability of farm business can be deducted from the relationship between costs incurred and returns obtained from it. The cost structure depends upon the type of resource employed, the resource mix and the extent of their employment. The primary focus of this section was, therefore, the resource use structure in the cultivation of vegetable crops. The information on utilization of different physical inputs used by the sampled farmers are presented in Table 1. It was observed that brinjal and cauliflower required large amount of human labour days. The per hectare total human labour days use for brinjal was 90.41 male and 180.81 female labour days. Whereas, 67.72 male and 117.50 female labour days for cauliflower cultivation. The quantum of hired human labours was more than the owned family labours. The per hectare bullock labours were used maximum for brinjal (12.26 pair days) followed by cauliflower (11.31 pair days). Due to labour intensive nature of these crops, there existed a well spread employment for the labour in general and hired labour in particular. The seedlings per hectare used by the growers were 36,154 in brinjal and 35,020 in cauliflower. Ali and Gupta (2001) studied the input requirements, cost and returns in brinjal (*Solanum melongena*) production in Hooghly district of West Bengal. They concluded that family labour comprised of 52.64 % of the total labour applied for aubergines cultivation. Kumar and Arora (1999) studied the resource use level for bullock labour 35.59 days, human labour 318.58 man days, FYM 201.04 qtls, nitrogen 53.01 kg, phosphorus 31.22 kg, potash 12.91 kg, seed 0.03 kg and the expenditure of Rs.383.23 on agro-chemicals. In case of cabbage, per hectare input utilization for bullock labour 35.75 days, human labour 297.28 man days, FYM 105.27 qtls., nitrogen 99.06 kg,  $P_2O_5$  50.68 kg,  $K_2O$  16.92 kg, seed 1.49 kg and the expenditure of Rs. 334.35 on agro-chemicals was noticed. While, in case of cauliflower, the per hectare input utilization were bullock labour 25.83 days, human labour 193.10 man days, FYM 59.71 qtls., N 23.12 kg,  $P_2O_5$  3.99 kg,  $K_2O$  0.88 kg, seed 1.37 kg and expenditure of Rs. 105.92 on agro-chemicals.

The vegetable growers applied 11.88 tones of manure per hectare for cauliflower and 11.04 tones for brinjal crop. The use of manure was observed to be less than the recommended quantity for both the vegetable crops. The per hectare application of plant nutrients like nitrogen, phosphorus and potassium through chemical fertilizers was in the order of 134.09, 50.28 and 59.99 kg, respectively for brinjal crop while, the consumption of these nutrients were 99.13, 47.39 and 55.38 kg, respectively for cauliflower. The use level of nitrogenous, phosphorus and

**Table 1 : Per hectare physical inputs used by brinjal and cauliflower cultivation**

| Sr. No. | Particulars              | Unit      | Brinjal         | Cauliflower     |
|---------|--------------------------|-----------|-----------------|-----------------|
| 1.      | Total human labour       | Days      |                 |                 |
|         | (a) Male                 |           | 90.41 (33.33)   | 67.72 (36.56)   |
|         | (b) Female               |           | 180.81 (66.67)  | 117.50 (63.44)  |
|         | Total                    |           | 271.22 (100.00) | 185.22 (100.00) |
|         | Total hired human labour | Days      |                 |                 |
|         | (a) Male                 |           | 71.75 (30.04)   | 51.25 (32.54)   |
|         | (b) Female               |           | 167.12 (69.96)  | 106.25 (67.46)  |
|         | Total                    |           | 238.87 (100.00) | 157.50 (100.00) |
|         | Total family labour      | Days      |                 |                 |
|         | (a) Male                 |           | 18.66 (57.68)   | 16.47 (59.42)   |
|         | (b) Female               |           | 13.69 (42.32)   | 11.25 (40.58)   |
|         | Total                    |           | 32.35 (100.00)  | 27.72 (100.00)  |
| 2.      | Bullock labour           | Pair days | 12.26           | 11.31           |
| 3.      | Seedling                 | Nos.      |                 |                 |
|         | Recommended              |           | 36,000          | 35,000          |
|         | Used                     |           | 36,154          | 35,020          |
| 4.      | Manure                   | Tonnes    |                 |                 |
|         | Recommended              |           | 20.00           | 15.00-20.00     |
|         | Used                     |           | 11.04           | 11.88           |
|         | Fertilizers              |           |                 |                 |
| 5.      | Nitrogen                 | Kg        |                 |                 |
|         | Recommended              |           | 100.00          | 80.00           |
|         | Used                     |           | 134.09          | 99.13           |
| 6.      | Phosphorus               | Kg        |                 |                 |
|         | Recommended              |           | 37.50           | 40.00           |
|         | Used                     |           | 50.28           | 47.39           |
| 7.      | Potassium                | Kg        |                 |                 |
|         | Recommended              |           | 37.50           | 37.50           |
|         | Used                     |           | 59.99           | 55.38           |

Note : Figures in parenthesis indicate percentage to total

potassium fertilizer was relatively more in both the vegetable crops. The total cost of cultivation per hectare of brinjal and cauliflower was Rs. 67,167 and Rs. 49,869, respectively. The share of cash expenditure *i.e.* cost 'A' ranged between 63.10 and 62.49 per cent of the total cost. Whereas, the share of cost 'B' ranged between 88.50 and 88.13 per cent and cost 'C<sub>1</sub>' was 90.91 per cent for both the crops of the total cost for the crops under study. The rental value of own land, human labour, miscellaneous cost (which included hired implements cost, market expenditure and land revenue), manures, irrigation, insecticides/pesticides, seedling and fertilizers were the major items of costs for the crops under study. Ali and Gupta (2001) studied the on average, cost 'A' (with the cost of oil cake as the most important cost item) and cost 'D' (input values of family labour and oil cake costs) were Rs. 16,926.23 and Rs. 20,508.24, respectively. Net return over cost 'A' and 'D' were Rs. 46,459.71 and Rs. 42,877.70

per ha, respectively. Pandey *et al.* (2001) studied the comparative economics of vegetable based cropping system in Shimla district of Himachal Pradesh. They concluded that the cost of cultivation of seed potato and cabbage was worked out to be Rs. 30,900 and Rs. 34,880 per ha, respectively. The major cost component in potato seed was (51 %) followed by human labour (25 %), manures and fertilizers (3.0 %) and plant protection (3.0 %). But in case of cabbage, the maximum contribution to cost was that of human labour (43.3 %) followed by seed (43 %), plant protection (3.8 %) and manures and fertilizers (3.1 %). It is evident from Table 3 that output per hectare was the highest (313 q) in brinjal followed by cauliflower (131 q). The gross value of output was Rs. 1,06,561 and Rs. 79,887 in brinjal and cauliflower crops, respectively. The per hectare net returns over cost 'C<sub>2</sub>' was observed to be highest in case of brinjal (Rs. 39,394) followed by cauliflower (Rs. 30,018). The per quintal cost of production

**Table 2 : Per hectare cost of cultivation of brinjal and cauliflower**

| Sr. No. | Items of cost                       | Brinjal |                | Cauliflower |                |
|---------|-------------------------------------|---------|----------------|-------------|----------------|
|         |                                     | Cost    | Per cent share | Cost        | Per cent share |
| 1.      | Hired human labour (days)           |         |                |             |                |
|         | Male                                | 3,588   | 5.34           | 2,563       | 5.14           |
|         | Female                              | 8,356   | 12.44          | 5,313       | 10.65          |
| 2.      | Bullock labour                      | 1,349   | 2.01           | 1,244       | 2.49           |
| 3.      | Seedling                            | 3,615   | 5.38           | 5,250       | 10.53          |
| 4.      | Manures                             | 5,391   | 8.03           | 4,750       | 9.53           |
| 5.      | Fertilizers                         | 2,645   | 3.94           | 2,415       | 4.84           |
| 6.      | Irrigation                          | 5,024   | 7.48           | 2,504       | 5.02           |
| 7.      | Insecticides/pesticides             | 4,060   | 6.04           | 2,018       | 4.05           |
| 8.      | Miscellaneous cost                  | 5,864   | 8.73           | 3,824       | 7.67           |
| 9.      | Interest on working capital         | 94      | 0.14           | 84          | 0.17           |
| 10.     | Depreciation                        | 2,399   | 3.57           | 1,199       | 2.40           |
|         | Cost-‘A’                            | 42,385  | 63.10          | 31,164      | 62.49          |
| 11.     | Rental value of owned land          | 17,011  | 25.33          | 12,743      | 25.55          |
| 12.     | Interest on fixed capital           | 47      | 0.07           | 42          | 0.09           |
|         | Cost-‘B’                            | 59,443  | 88.50          | 43,949      | 88.13          |
| 13.     | Family labour                       |         |                |             |                |
|         | Male                                | 933     | 1.39           | 823         | 1.65           |
|         | Female                              | 685     | 1.02           | 563         | 1.13           |
|         | Cost-‘C <sub>1</sub> ’              | 61,061  | 90.91          | 45,335      | 90.91          |
| 14.     | Managerial cost                     | 6,106   | 9.09           | 4,534       | 9.09           |
|         | Cost-‘C <sub>2</sub> ’ (Total cost) | 67,167  | 100.00         | 49,869      | 100.00         |

was highest *i.e.* Rs. 381 in case of cauliflower. It was followed by brinjal (Rs. 215). The input-output ratio for brinjal and cauliflower was 1.59 and 1.60, respectively. Kiresur *et al.* (1993) studied costs-returns profiles in

vegetable production, a case study in Dharwad district of Karnataka. They revealed that the cost of production were highest for potatoes followed by onions, tomatoes and aubergines. The highest per quintal net returns were obtained from aubergines to the extent of Rs. 58 followed by onions (Rs. 51/quintal). Naikade (1999) studied the comparative economics of production and marketing of potato and onion in *Rabi* season in Khed Taluka of Pune district. He reported that the average per hectare cost of cultivation for potato was Rs. 63,433.20. Average gross and net returns were Rs. 66,540.00 and Rs. 3,106.80, respectively. Whereas the average per hectare total cost of cultivation (cost ‘C’) for onion was Rs.39,910.88. The major items of cost of cultivation were human labour, seed and rental value of land. Average gross and net returns were Rs. 49,816.00 and Rs. 10,625.10, respectively. The

**Table 3 : Per hectare output, cost of production, gross and net returns and profitability of brinjal and cauliflower**

| Sr. No. | Particulars                                   | Brinjal  | Cauliflower |
|---------|---|----------|-------------|
| 1.      | Output (yield in qtls.)                       | 313      | 131         |
| 2.      | Price received per quintal (Rs.)              | 340.45   | 609.82      |
| 3.      | Value of output (Rs.)                         | 1,06,561 | 79,887      |
| 4.      | Cost of cultivation (Rs.)                     | 67,167   | 49,869      |
| 5.      | Per quintal cost of production (Rs.)          | 215      | 381         |
| 6.      | Net returns over cost ‘A’ (Rs.)               | 64,176   | 48,723      |
| 7.      | Net returns over cost ‘B’ (Rs.)               | 47,118   | 35,938      |
| 8.      | Net returns over cost ‘C <sub>1</sub> ’ (Rs.) | 45,500   | 34,552      |
| 9.      | Net returns over cost ‘C <sub>2</sub> ’ (Rs.) | 39,394   | 30,018      |
| 10.     | Input-output ratio at cost ‘C <sub>2</sub> ’  | 1:1.59   | 1:1.60      |

**Table 4 : Bulk-line cost of brinjal and cauliflower on the basis of cost ‘C<sub>2</sub>’**

| Per centage coverage of | Brinjal | Cauliflower |
|-------------------------|---------|-------------|
| Production (%)          | 85.00   | 85.00       |
| Farmers (%)             | 85.00   | 75.00       |
| Area (%)                | 83.50   | 85.00       |
| Bulk-line cost (Rs./q.) | 227.00  | 404.00      |
| Harvest price (Rs./q.)  | 340.45  | 609.82      |

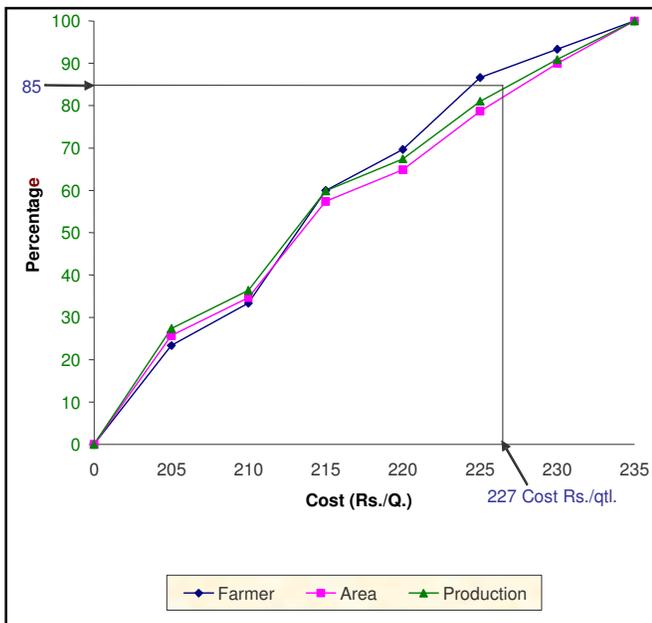


Fig. 1 : Bulk-line cost of brinjal

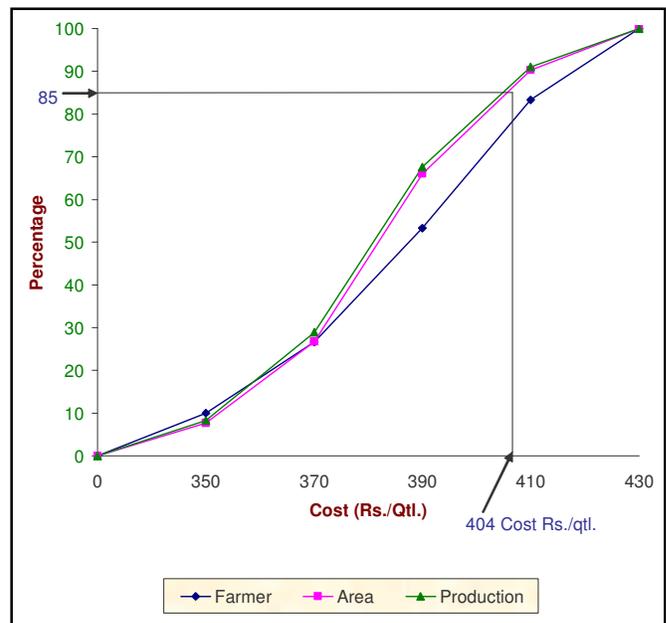


Fig. 2 : Bulk-line cost of cauliflower

returns per rupee spent were Rs. 1.05 and Rs. 1.27 for potato and onion, respectively. Hence, onion crop was found to be more profitable than potato. Tiwari and Bhagat (2002) studied the input use, costs and returns in the production of four *Rabi* vegetable crops (tomato, potato, cauliflower and onion) in Rewa district of Madhya Pradesh. Production costs were found highest for potato (Rs. 22,538.80), while the highest net returns were recorded for cauliflower (Rs. 22,345.14).

From the above discussion on resources use, costs and returns of vegetable crop production in the area under study, it is evident that there existed wide variations in the resource use as well as costs and returns structure. Thus, the hypothesis that the resource use, costs and returns structure differ for different vegetable crops, get confirmed.

Bulk-line cost was worked out to be Rs. 227 per quintal for brinjal and Rs. 404 per quintal for cauliflower on the basis of cost 'C<sub>2</sub>'. The farmers covered under bulk-line cost for brinjal and cauliflower was 85.00 and 75.00 per cent, respectively (Table 4, Fig. 1 and 2).

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