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### Economic Analysis of Production of Paddy in Bhandara District in Vidarbha Region

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**Abstract:** The study of economic analysis of production of paddy in Bhandara district was conducted during the year 2013-2014. The per hectare cost of cultivation i.e.cost 'C' at overall level ,for Bhandara district was Rs. 35935.72. The total cost "C" was the highest in medium farmer i.e. Rs. 36403.70, out of which Cost 'A' accounted for Rs. 25040.51, (68.79 per cent) and cost 'B' Rs. 33101.95, (90.93 per cent). The per hectare cost of production of paddy in large farmer was Rs 36289.30 and in small farmer it was Rs 35114.16. The gross returns per hectare was the highest in large farmer i.e.Rs. 54029.32 , in medium farmer it was Rs. 51539.47 and small farmer it was Rs 48248.36. the per hectare net returns at cost 'A' in case of small, medium and large farmers were Rs. 25283.14, Rs 26498.96 and Rs 28501.18, respectively. The per quintal cost of production was the highest in case of small farmer.i.e.Rs.1000.48 pre hectare. The output-input ratio was greater than unity which indicated that the paddy is profitable crop in Bhandara district in vidarbha region.

#### INTRODUCTION

India is the largest rice (*Oryza sativa*) growing country (44.6 million hectare), while china is the largest producer of rice in the world (Anonymous, 2012).

By 2025 the world population is expected to rise to 8.35 billion requiring 60 per cent more rice production as compared to the current production in order to meet the demand created by increasing

population. Rice is the major staple food of more than 60 per cent of the world's populations. It is the staple food of most of the people of South Eastern Asia. In India, it accounts for more than 40 per cent food grain production, providing direct employment to 70 per cent people in rural area (Sharma *et al.*, 2007).

The important rice growing region in Maharashtra is all the districts of konkan region and Bhandara, Gondia, Chandrapur and Gadchiroli and part of Nagpur district in Vidharbha. Vidarbha cover 7.36 lakh hectare area and 11.92 lakh metric tonne production under paddy. Bhandara cover 1.8 lakh hectare area under paddy and 2.49 lakh tonnes production with productivity 1310 kg per hectare (Anonymous, 2013). Bhandra district is in agriculturally developed district may be because of the mono crop paddy. Bhandara district is historically important for the cultivation of paddy crop. Practically the entire agricultural population is either directly or indirectly dependent on the success of this crop. Bhandara, Chandrapur, Gadchiroli district comes under moderately high rainfall zone. Bhandara and Gondia district is the principal paddy growing districts and rank first in Vidarbha in area and production. Bhandara and Gondia district lies on eastern border of Maharashtra state adjoining the rice is an important staple food and cash crop for the growers of this region. The grower in this region grows rice mainly for the business consideration while choosing of the different varieties available which ultimately gives more returns. As the rainfall in the district is heavy, rice is grown on a large scale. Rice is grown to some extent in all the talukas of Bhandara district. It is grown on a large scale in Bhandara, Lakhani, Sakoli, Lakhandur, Tumsar, Pauni and Mohadi talukas in kharif season as well as in summer season under irrigated condition.

Hence, the present study was undertaken with a view to study the per unit cost and returns and input-output ratio of paddy.

## MATERIALS AND METHODS

The present study was restricted to Bhandara district only in Vidarbha region. The Ninety farmers were selected from three tahasils i.e. Lakhani, Sakoli and Lakhandur randomly in Bhandara district. Primary data were collected representing almost all representative area up to village level in the district for the year 2013-2014. The primary data on input utilization, cost of cultivation and returns were collected from the selected growers and other relevant information was collected through the survey method with the help of pretested schedules. The village wise data so collected for cost of cultivation and returns were compiled for the whole district. For studying the economics of production of paddy the standard cost concept i.e. Cost 'A', Cost 'B' and Cost 'C' were used. The analytical part of the research was mainly confined to:

- 1) Estimation of per hectare Cost 'A', Cost 'B', and Cost 'C'.
- 2) Per hectare net returns at Cost 'A', Cost 'B', and Cost 'C'.

$$3) \text{ Output-input ratio} = \frac{\text{Gross income}}{\text{Respective cost}}$$

## RESULTS AND DISCUSSION

The degree of management of the resources can be judged for the utilization of resources, the choice and the decision making. Beside this, it also indicates the level of technology adopted by the farmers.

It is revealed from the Table 1 that the family labour utilization was the highest in small (72.47 man days) size group farmer as compared to, medium (46.21 man days) and large (32.02 man days). The per hectare total human labour utilization was 178.12, 171.08 and 163.43 man days. At overall level total human labour utilization was 170.87 man days. Use of male labour out of total family labour in all size group of farmer was more because they themselves

**Table 1**  
**Per hectare input utilization of paddy**

| <i>Sr.No. Particulars</i>           | <i>Size of Holding</i> |               |              |                |
|-------------------------------------|------------------------|---------------|--------------|----------------|
|                                     | <i>Small</i>           | <i>Medium</i> | <i>Large</i> | <i>Overall</i> |
| 1 Human labour (Man days)           |                        |               |              |                |
| i) Family labour                    |                        |               |              |                |
| a) Male                             | 44.18                  | 27.94         | 20.27        | 30.80          |
| b) Female                           | 28.29                  | 18.27         | 11.75        | 19.44          |
| Sub-total                           | 72.47                  | 46.21         | 32.02        | 50.24          |
| ii) Hired human labour              |                        |               |              |                |
| a) Male                             | 28.04                  | 40.11         | 39.78        | 35.98          |
| b) Female                           | 77.94                  | 86            | 91.49        | 85.14          |
| Sub-total                           | 105.98                 | 126.11        | 131.27       | 121.12         |
| iii) Total human labour             |                        |               |              |                |
| a) Male                             | 72.22                  | 68.05         | 60.19        | 66.82          |
| b) Female                           | 105.90                 | 103.02        | 103.24       | 104.05         |
| Sub-total                           | 178.12                 | 171.08        | 163.43       | 170.87         |
| 2 Bullock labour (pair days)        |                        |               |              |                |
| a) Hired                            | 2.82                   | 1.25          | 2.51         | 2.19           |
| b) Owned                            | 14                     | 17.23         | 18.25        | 16.49          |
| Sub-total                           | 16.82                  | 18.48         | 20.76        | 18.69          |
| 3 Machine (Hours)                   |                        |               |              |                |
| a) Hired                            | 6.2                    | 10.92         | 12.98        | 10.03          |
| b) Owned                            | 0                      | 15.95         | 14.94        | 10.30          |
| Sub-total                           | 6.2                    | 26.87         | 27.92        | 20.33          |
| 4 Seed (kg)                         | 57.38                  | 55.21         | 58.15        | 56.91          |
| 5 Manures (q)                       | 20.10                  | 18.61         | 24.82        | 21.18          |
| 6 Fertilizers (kg)                  |                        |               |              |                |
| a) N                                | 75.13                  | 88.33         | 90.95        | 84.80          |
| b) P                                | 63.14                  | 55.92         | 65.91        | 61.66          |
| c) K                                | 10.45                  | 18.64         | 15.26        | 14.78          |
| Total fertilizers                   | 148.72                 | 162.89        | 172.12       | 161.2433       |
| Plant protection (Rs <sup>6</sup> ) | 918.32                 | 1059.41       | 1136.03      | 1037.92        |

were involved in cultivation operations which are male dominating.

The bullock labour utilization in the case of small, medium and large farmer was 16.82, 18.48

and 20.76 pair days, respectively. While the machine hours was less (6.2 hours) in small farmer as compared to medium (26.87 hours), large (27.92 hours), and overall (20.33 hours), respectively. The

per hectare paddy seed utilization in the case of small, medium and large farmer was 57.38, 55.21 and 58.15 kg per hectare, respectively. At overall level it was 56.91 kg per hectare. The per hectare manure utilization for small, medium and large farmer was 20.10, 18.61, and 24.82 quintals, respectively. The total fertilizer applied in small, medium and large farmer was 148.72, 162.89 and 172.12 kg in the form of N, P and K per hectare, respectively. The expenditure on plant protection in large farmer was the highest (Rs. 1136.03) as compared to medium

(Rs.1059.41) and small (Rs. 918.32) farmer respectively. At overall level expenditure on plant protection was Rs. 1037.92.

The estimation of cost helps us to know the profitability of a crop enterprise. It is revealed from the table 2, that Per hectare cost of production for paddy for different size group was worked and presented in table 2. It is found that the total cost "C" was the highest in medium farmer Rs. 36403.70, out of which Cost 'A' accounted for Rs. 25040.51, (68.79 per cent) and cost B Rs. 33101.95, (90.93 per

**Table 2**  
**Per hectare cost of cultivation of paddy (Rs/ha)**

| Particulars                          | Size of holding    |                    |                    |                    |
|--------------------------------------|--------------------|--------------------|--------------------|--------------------|
|                                      | Small              | Medium             | Large              | Overall            |
| <b>1) Hired human labour</b>         |                    |                    |                    |                    |
| a) Male                              | 2936.35<br>(8.36)  | 3863.69<br>(10.61) | 3910.07<br>(10.77) | 3570.04<br>(9.93)  |
| b) Female                            | 4730.00<br>(13.47) | 5520.86<br>(15.17) | 5351.42<br>(14.75) | 5200.76<br>(14.47) |
| Total hired human                    | 7566.35<br>(21.55) | 9384.55<br>(25.78) | 9261.49<br>(25.52) | 8737.46<br>(24.31) |
| <b>2) Bullock labour (Pair days)</b> |                    |                    |                    |                    |
| a) Hired                             | 969.22<br>(2.76)   | 275.64<br>(0.76)   | 690.25<br>(1.90)   | 645.04<br>(1.79)   |
| b) Own                               | 2782.43<br>(7.92)  | 2670.78<br>(7.34)  | 2287.78<br>(6.30)  | 2580.33<br>(7.18)  |
| Total bullock labour                 | 3751.65<br>(10.68) | 2946.42<br>(8.09)  | 2978.03<br>(8.21)  | 3225.36<br>(8.98)  |
| <b>3) Machine labour</b>             | 2354.26<br>(6.70)  | 3087.89<br>(8.48)  | 3105.18<br>(8.56)  | 2849.11<br>(7.93)  |
| <b>4) Seed</b>                       | 2077.90<br>(5.92)  | 2047.41<br>(5.62)  | 2209.97<br>(6.09)  | 2111.76<br>(5.88)  |
| <b>5) Manures</b>                    | 1246.47<br>(3.55)  | 1112.80<br>(3.06)  | 1209.65<br>(3.33)  | 1189.64<br>(3.31)  |
| <b>6) Fertilizers</b>                |                    |                    |                    |                    |
| a) N                                 | 1257.93<br>(3.58)  | 1413.28<br>(3.88)  | 1530.00<br>(4.22)  | 1400.40<br>(3.90)  |
| b) P                                 | 1252.15<br>(3.57)  | 1271.28<br>(3.49)  | 1316.56<br>(3.63)  | 1279.99<br>(3.56)  |
| c) K                                 | 94.95<br>(0.27)    | 72.66<br>(0.20)    | 101.82<br>(0.28)   | 89.81<br>(0.25)    |

contd. table 2

*Economic Analysis of Production of Paddy in Bhandara District in Vidarbha Region*

| Particulars                          | Size of holding     |                     |                     |                     |
|--------------------------------------|---------------------|---------------------|---------------------|---------------------|
|                                      | Small               | Medium              | Large               | Overall             |
| Total fertilizers                    | 2605.03<br>(7.42)   | 2757.22<br>(7.57)   | 2948.38<br>(8.12)   | 2770.21<br>(7.71)   |
| 7) Plant protection                  | 918.32<br>(2.62)    | 1059.42<br>(2.91)   | 1136.04<br>(3.13)   | 1037.92<br>(2.89)   |
| 8) Incidental charges                | 251.99<br>(0.72)    | 396.32<br>(1.09)    | 274.63<br>(0.76)    | 307.65<br>(0.86)    |
| 9) Repairing charges                 | 340.15<br>(0.97)    | 323.43<br>(0.89)    | 427.93<br>(1.18)    | 363.84<br>(1.01)    |
| 10) Land revenue                     | 24.13<br>(0.07)     | 30.35<br>(0.08)     | 38.27<br>(0.11)     | 30.92<br>(0.09)     |
| 11) Depreciation                     | 456.25<br>(1.30)    | 507.81<br>(1.39)    | 525.50<br>(1.45)    | 496.52<br>(1.38)    |
| 12) Interest on working capital @ 6% | 1272.73<br>(3.62)   | 1386.93<br>(3.81)   | 1401.78<br>(3.86)   | 1355.58<br>(3.77)   |
| 13) Cost 'A'                         | 22965.22<br>(65.40) | 25040.51<br>(68.79) | 25528.14<br>(70.35) | 24511.29<br>(68.21) |
| 14) Rental value of land             | 6539.79<br>(18.62)  | 7070.78<br>(19.42)  | 7346.04<br>(20.24)  | 6985.54<br>(19.44)  |
| 15) Interest on fixed capital @ 10%  | 1005.50<br>(2.86)   | 990.66<br>(2.72)    | 1120.99<br>(3.09)   | 1039.05<br>(2.89)   |
| 16) Cost 'B'                         | 30510.52<br>(86.89) | 33101.95<br>(90.93) | 33995.17<br>(93.68) | 32535.88<br>(90.54) |
| 17) Family labour                    |                     |                     |                     |                     |
| a) Male                              | 2764.80<br>(5.73)   | 2114.20<br>(4.10)   | 1530.38<br>(2.83)   | 2136.46<br>(4.17)   |
| b) Female                            | 1838.85<br>(3.81)   | 1187.55<br>(2.30)   | 763.75<br>(1.41)    | 1263.38<br>(2.47)   |
| Total family labour                  | 4603.65<br>(9.54)   | 3301.75<br>(6.41)   | 2294.13<br>(4.25)   | 3399.84<br>(6.63)   |
| 18) Cost 'C'                         | 35114.16<br>(100)   | 36403.70<br>(100)   | 36289.30<br>(100)   | 35935.72<br>(100)   |
| 19) Production                       |                     |                     |                     |                     |
| a) Main produce                      | 44399.06            | 47550.67            | 49919.02            | 47263.37            |
| b) By produce                        | 3849.30             | 3988.80             | 4110.30             | 3982.80             |
| Total production                     | 48248.36            | 51539.47            | 54029.32            | 51246.17            |

cent). Ansari *et al.* (2009) reported that per hectare returns and net profit, were Rs. 15443.13 and Rs. 5635.40, respectively. Kumar *et al.* (2003) the average net income was Rs. 10273.66 and farm business income came to Rs. 19009.14 per hectare. At overall net returns was Rs. 15310.45. Among the different

item of cost, total hired human shared 25.78 per cent, 25.52 per cent and 21.55 per cent of the total cost in medium, large and small farmers, respectively. The highest fertilizer shared (8.12 per cent) in large farmer. Other input such as plant protection, machine labour, seed, FYM, shared 3.13 per cent,

8.56 per cent, 6.09 per cent and 3.33 per cent was found more in large size group, respectively. The family labour shared was the highest (9.54 per cent) in total cost in small farmer as compared to medium (6.41 per cent) and large(4.25 per cent) size group.

From the above results, it is concluded that the per hectare cost of cultivation of paddy in different size group of farmer was the highest in the case of medium (Rs.36403.70) followed by large (Rs 36289.30) and small (Rs 35114.16) farmer of paddy.

It is revealed from table 3, that the gross returns per hectare was the highest in large farmer (Rs 54029.32) followed by medium (Rs 51539.47) and small (Rs 48248.36) farmer respectively. On the other

side, the per hectare net returns at cost 'A' in case of small, medium and large farmers were Rs 25283.14, Rs 26498.96 and Rs 28501.18, respectively. The per hectare net returns at cost 'C' was Rs.13134.20, Rs 15135.77 and Rs 17740.02 in small, medium and large size of farmer, respectively. Patel *et al.* (2011) reported the cost and returns and output input ratio of production of wheat (unirrigated) in Bhal region of Ahmadabad district (Gujarat). Resulty of the study indicated that average cost of cultivation per hectare was Rs. 11968.38. The average net profit per hectare was Rs. 4228.33 per hectare and the over all input output ratio was 1.38. Similar results were also reported by Singh *et al.*(1991) The per quintal

**Table 3**  
**Economics of production of paddy (Rs/ha)**

| Sr. No. | Particulars                    | Size of Holding |          |          |          |
|---------|--------------------------------|-----------------|----------|----------|----------|
|         |                                | Small           | Medium   | Large    | Overall  |
| 1       | cost of cultivation            |                 |          |          |          |
|         | a) Cost 'A'                    | 22965.22        | 25040.51 | 25528.15 | 24511.29 |
|         | b) Cost 'B'                    | 30510.52        | 33101.95 | 33995.17 | 32535.88 |
|         | c) Cost 'C'                    | 35114.16        | 36403.70 | 36289.30 | 35935.72 |
| 2       | Yield                          |                 |          |          |          |
|         | a) Main produce                | 44399.06        | 47550.67 | 49919.02 | 47263.37 |
|         | b) By produce                  | 3849.30         | 3988.80  | 4110.30  | 3982.80  |
|         | c) Gross returns               | 48248.36        | 51539.47 | 54029.32 | 51246.17 |
| 3       | Net returns at                 |                 |          |          |          |
|         | a) Cost 'A'                    | 25283.14        | 26498.96 | 28501.18 | 26734.88 |
|         | b) Cost 'B'                    | 17737.85        | 18437.51 | 20034.15 | 18710.29 |
|         | c) Cost 'C'                    | 13134.20        | 15135.77 | 17740.02 | 15310.45 |
| 4       | Output-Input ratio at          |                 |          |          |          |
|         | a) Cost 'A'                    | 2.10            | 2.06     | 2.12     | 2.09     |
|         | b) Cost 'B'                    | 1.58            | 1.56     | 1.59     | 1.58     |
|         | c) Cost 'C'                    | 1.37            | 1.42     | 1.49     | 1.43     |
| 5       | Per quintal cost of production | 1000.48         | 995.85   | 960.97   | 985.29   |
| 6       | Yield per quintal (q/ha)       |                 |          |          |          |
|         | a) Main produce                | 31.25           | 32.55    | 33.50    | 32.43    |
|         | b) By produce                  | 42.77           | 44.32    | 45.67    | 44.25    |

cost of production was the highest in case of small farmer (Rs.1000.48). At overall level per quintal cost was Rs. 985.29. The output-input ratio was the highest at cost 'A' (2.12), cost 'B' (1.59) and cost 'C' (1.49) in large size group of farmer.

### CONCLUSION

1. Per hectare cost of cultivation at cost "C" was the highest in the medium (Rs. 36403.70) as compared to small (Rs. 35114.16) and large (Rs. 36289.30) size group of farmer.
2. The output input ratio was the highest in the large (1.49) followed by medium (1.42) and small (1.37) size group of farmer at cost "C".
3. The net returns was the highest in the large (Rs. 17740.02) as compared to medium (Rs. 15135.77) and small (Rs. 13134.20) size of farmer.

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