

RESEARCH PAPER

Cost, returns and profitability in sugarcane cultivation in Konkan region (MS)

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ABSTRACT

In suru sugarcane group per hectare cost 'A' was Rs. 75,423, cost 'B' was Rs. 1,15,600 and cost 'C' was Rs. 1,43,664 while in ratoon sugarcane group per hectare cost 'A' was Rs. 48,228, cost 'B' was Rs. 71,693 and cost 'C' was Rs. 88,873, respectively. The net returns in suru sugarcane group were Rs. 1,63,286, Rs. 1,23,109 and Rs. 95,045 at cost 'A', 'B' and 'C', respectively while in ratoon sugarcane group net returns were Rs. 91,339, Rs. 67,874 and Rs. 50,694 at cost 'A', 'B' and 'C', respectively. The analysis of per hectare profitability of suru sugarcane and ratoon sugarcane crop indicated that cultivation of both type of sugarcane were profitable at all the levels of cost, as indicated by into benefit-cost ratio of suru sugarcane 1.66 and ratoon sugarcane 1.57. In suru sugarcane group per hectare main produce was 102.45 tonne and by produce was 20.49 tonne while in ratoon sugarcane group main produce was 59.90 tonne and by produce was 11.98 tonne.

KEY WORDS : Cost, Returns, Profitability, B:C ratio

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Maharashtra is the highest sugar producing state of India. In Maharashtra sugarcane yield in 2011-12 was 80.10 tons /ha, which was much higher compared to the yield of 59.58 tons/ha for the second highest sugar producing state Uttar Pradesh and national average of 70.31 tons/ha. The average sugar recovery rate of the four sugarcane cultivation types in Maharashtra was 11.32 per cent in 2011-12. Economic viability of such crops is in a weak position and the farmers are enthusiastic to shift the land use pattern from traditional subsistence food grain crops to market oriented value added crops and so it has been moving up

gradually (New Agricultural Policy, 2007). Like the other value added crops, sugarcane is also more attractive crop for MNCs (Multi National companies) to invest their capital (Tiwari, 2003).

The recovery rate of Adsali sugarcane was even higher at 12.3 per cent. The average recovery percentage of Maharashtra was also above the recovery percentage of Uttar Pradesh at 9.16 per cent and all India at 10.25 per cent. In terms of the land productivity adjusted for recovery rate is even higher for Maharashtra at 98.8 tons/ha (161.14 tons/ha for Adsali) compared to 61.04 tons/ha for Uttar Pradesh.

Among the four sugarcane cultivation types prevalent in Maharashtra, ratoon is most popular with 40 per cent cane area under it, possibly since it has shortest duration of 11 months, fitting almost perfectly with the annual October to March cane crushing season. Same can be said about Suru type, which is having duration of 12 months and coverage of 20 per cent. Adsali type has the highest yield and recovery rate, but has only 10 per cent of the sugarcane area under

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cultivation, possibly due to the longest duration of 17 months. Pre-seasonal type, as the name suggests, it is planted about 2.5 months before the season, and stands between Ratoon and Adsali in terms of duration, yield and recovery rate.

Considering the importance of sugarcane in economy of farmers, the present study was conducted in Sindhudurg district of Maharashtra state, since this district is witnessing development rapidly as a sugarcane producers from the non-traditional areas of the state. The study was conducted to know the per hectare cost of production and profitability of sugarcane cultivation.

METHODOLOGY

The present study is carried out in Vaibhavwadi and Kankavali tahsils of Sindhudurg district as area under sugarcane cultivation was maximum in these two tahsils. The final sample consisted of 20 villages and 100 sugarcane cultivators. The sugarcane cultivators were classified into two groups on the basis of type of sugarcane grown *i.e.* suru sugarcane (57 cultivators) and ratoon sugarcane (74 cultivators). The data related to the agricultural year 2012-

2013 were collected by personal interviews with the sugarcane cultivators. The cost of cultivation was worked out by using standard cost concepts.

ANALYSIS AND DISCUSSION

The distribution of sample farmers according to season of sugarcane crop grown is given in Table 1.

The total sample of 100 sugarcane farmers was selected from the Sindhudurg district, of the total sample 44 per cent farmers were cultivating suru type of sugarcane and 56 per cent farmers were cultivating ratoon type sugarcane, indicating that some of the farmers were cultivating both the type of crop.

Per hectare physical input utilization :

The per hectare physical input utilization for sugarcane cultivation is given in Table 2.

It is observed from the Table 2 that, for suru sugarcane cultivation per hectare total human labour used were 284.62 days, of which 163.55 days were male labour and 121.07 days were female labour while in ratoon sugarcane cultivation per

Table 1 : Classification of sample farmers according to type of sugarcane crop

| Sr. No. | Particulars | Number of farmers | Percentage (n=100) |
|---------|------------------|-------------------|--------------------|
| 1. | Suru sugarcane | 57 | 43.51 |
| 2. | Ratoon sugarcane | 74 | 56.49 |

Table 2 : Per hectare physical input utilization in sugarcane cultivation

| Sr. No. | Particulars | Suru (n=57) | Ratoon (n=74) |
|---------|-----------------------------------|-------------|---------------|
| 1. | Hired labour (days) | | |
| | Male | 103.81 | 61.24 |
| | Female | 80.89 | 70.88 |
| | Total | 184.70 | 132.12 |
| 2. | Family labour (days) | | |
| | Male | 59.74 | 31.68 |
| | Female | 40.18 | 29.58 |
| | Total | 99.92 | 61.26 |
| 3. | Total labour (days) | | |
| | Male | 163.55 | 92.92 |
| | Female | 121.07 | 100.46 |
| | Total | 284.62 | 193.38 |
| 4. | Bullock labour (pair days) | 14.13 | 6.19 |
| 5. | Planting material (tonne) | 2.59 | - |
| 6. | Manures (tonne) | 2.65 | 2.55 |
| 7. | Fertilizers (kg.) | | |
| | N | 342.54 | 327.49 |
| | P | 166.32 | 165.34 |
| | K | 164.37 | 154.05 |
| 8. | Plant protection (lt.) | 2.59 | 2.48 |

hectare total human labour used were 193.38 days, of which 92.92 days were male labour and 100.46 days were female labour. Per hectare bullock labour used were 14.13 days in suru sugarcane cultivation while 6.19 days in ratoon sugarcane cultivation.

The per hectare quantity of planting material used was 2.59 tonne in suru sugarcane cultivation. Manures are an important input for sugarcane cultivation used to the extent of 2.65 tonne per hectare in suru sugarcane while 2.55 tonne per hectare in ratoon sugarcane cultivation. The per hectare quantity of fertilizers used in suru sugarcane cultivation was 342.54 kg of N, 166.32 kg of P and 164.37 kg of K while in ratoon sugarcane cultivation it was 327.49 kg of N, 165.34 kg of P and 154.05 kg of K.

It is also observed from the Table 2 that, in suru sugarcane cultivation use of hired labour (184.70 days) was very much higher than family labour (99.92 days), whereas, in case of ratoon sugarcane cultivation again use of hired labour

(132.12 days) was very much higher than family labour (61.26 days). Per hectare plant protection chemical used in suru sugarcane cultivation was 2.59 lt. while in ratoon sugarcane cultivation it was 2.48 lt.

Per hectare cost of cultivation of sugarcane :

The itemwise and groupwise per hectare cost of cultivation of sugarcane is presented in Table 3.

It is observed from the Table 3 that, total cost of cultivation (cost C) of suru sugarcane was worked out to Rs. 1,43,664, while in ratoon sugarcane it was worked out to Rs. 88,873. In suru sugarcane of the total cost (cost C) share of cost A was 52.53 per cent and cost B was 80.49 per cent while in ratoon sugarcane total cost of cultivation (cost C) was worked out to Rs. 88,873 of which share of cost A was 54.26 per cent and cost B was 80.66 per cent. However, cost A was minimum (Rs. 48,228) in ratoon sugarcane and it was maximum (Rs. 75423) in suru sugarcane.

| Sr. No. | Particulars | Suru (n=57) | | Ratoon (n=74) | |
|---------|--|--------------|----------|---------------|----------|
| | | Amount (Rs.) | Per cent | Amount (Rs.) | Per cent |
| 1. | Hired labour | | | | |
| | Male | 25953 | 18.07 | 15310 | 17.23 |
| | Female | 12134 | 8.45 | 10632 | 11.96 |
| | Total | 38087 | 26.52 | 25942 | 29.19 |
| | Bullock labour | 10598 | 7.38 | 4643 | 5.20 |
| 2. | Planting material | 6475 | 4.51 | | |
| 3. | Manures | 3975 | 2.77 | 3825 | 4.30 |
| 4. | Fertilizers | | | | |
| | N | 2055 | 1.43 | 1965 | 2.21 |
| | P | 1331 | 0.93 | 1323 | 1.49 |
| | K | 3945 | 2.75 | 3697 | 4.16 |
| 5. | Irrigation charges | 3075 | 2.14 | 2613 | 2.94 |
| 6. | Plant protection | 1476 | 1.03 | 1414 | 1.59 |
| | Input cost | 71017 | 45402 | 49.46 | 51.08 |
| 7. | Land revenue and other cesses | 100 | 0.07 | 75 | 0.08 |
| 8. | Depreciation on machinery and implements | 45 | 0.03 | 27 | 0.03 |
| 9. | Interest on working capital @ 6 per cent of input cost for 1 year | 4261 | 2.97 | 2724 | 3.07 |
| | Cost A | 75423 | 52.53 | 48228 | 54.26 |
| 10. | Interest on fixed capital @ 10 per cent | 492 | 0.34 | 279 | 0.31 |
| 11. | Rental value of owened land (1/6 of the gross returns- land revenue) | 39685 | 27.62 | 23186 | 26.09 |
| | Cost B | 115600 | 80.49 | 71693 | 80.66 |
| 12. | Family labour | | | | |
| | Male | 6027 | 4.20 | 4437 | 4.99 |
| | Female | 20962 | 14.60 | 12357 | 13.90 |
| | Total | 20962 | 14.60 | 12357 | 13.90 |
| 13. | Supervision charges @ 10 per cent of input cost | 7102 | 4.91 | 4823 | 5.44 |
| | Cost C | 143664 | 100.00 | 88873 | 100.00 |

(Figures in the parentheses are percentages to cost C)

In suru sugarcane, out of total cost, the most expensive item was rental value of land (27.62%) followed by hired human labour (26.52%), family labour (14.60%), bullock labour (7.38%), fertilizers (5.11%), supervision (4.91%) planting material (4.51%) interest on working capital (2.97%), manures (2.77%), irrigation charges (2.14%), plant protection (1.03%), interest on fixed capital (0.34%), land revenue and other cesses (0.07%) and depreciation on implements and machinery (0.03%).

In ratoon sugarcane crop out of total cost the most expensive item was hired human labour (29.19%) followed by rental value of land (26.09%), family labour (13.90%), fertilizers (7.86%), supervision (5.44%), bullock labour (5.20%), manures (4.30%), interest on working capital (3.07%), irrigation charges

(2.94%), plant protection (1.59%), interest on fixed capital (0.31%), land revenue and other cesses (0.08%) and depreciation on implements and machinery (0.03%).

These observations are similar with the findings of Bhosale *et al.* (2003). They studied an economic analysis of resource use and productivity of sugarcane in Satara district of Maharashtra state. This study revealed that, benefit:cost ratio at cost C was 1:1.92 thus, the sugarcane production in Satara district was a profitable crop enterprise.

Per hectare profitability of sugarcane cultivation :

Per hectare cost, returns and profitability of sugarcane cultivation was worked out as per standard cost concepts

| Table 4 : Per hectare profitability of sugarcane cultivation | | | |
|--|----------------------------|-------------|---------------|
| Sr. No. | Particulars | Suru (n=57) | Ratoon (n=74) |
| 1. | Production | | |
| | Main produce | | |
| | Quantity (t) | 102.45 | 59.90 |
| | Price received (Rs./t) | 2200 | 2200 |
| | Returns(Rs.) | 225390 | 131780 |
| 2. | By produce | | |
| | Quantity (t) | 20.49 | 11.98 |
| | Price received (Rs./t) | 650 | 650 |
| | Returns (Rs.) | 13319 | 7787 |
| | Gross returns (i+ii) (Rs.) | 238709 | 139567 |
| 3. | Costs (Rs.) | | |
| | Cost A (Rs.) | 75423 | 48228 |
| | Cost B (Rs.) | 115600 | 71693 |
| | Cost C (Rs.) | 143664 | 88873 |
| 4. | Net returns at (Rs.) | | |
| | Cost A (Rs.) | 163286 | 91339 |
| | Cost B (Rs.) | 123109 | 67874 |
| | Cost C (Rs.) | 95045 | 50694 |
| 5. | Cost/tonne (Rs.) | 1402 | 1484 |
| 6. | Cost/quintal (Rs.) | 140 | 148 |
| 7. | Benefit cost ratio | 1.66 | 1.57 |

| Table 5 : Frequency distribution : Constraints experienced by farmers in sugarcane cultivation | | | |
|--|--|-------------|---------------|
| Sr. No. | Nature of problem | Suru (n=57) | Ratoon (n=74) |
| 1. | Rate offered by sugar factories are non-remunerative | 39 (68.42) | 52 (70.27) |
| 2. | Inadequate returns adversely affected area under sugarcane | 38 (66.67) | 49 (66.21) |
| 3. | Non - availability of labour | 35 (61.40) | 32 (43.24) |
| 4. | Problem in timely and adequate availability of irrigation water from canal and river | 33 (57.89) | 29 (39.19) |
| 5. | Problem in availability of different types of fertilizer | 26 (45.61) | 28 (37.84) |
| 6. | Small size of holding | 24 (42.10) | 27 (36.47) |
| 7. | Difficulties in following tillage operation | 22 (38.60) | 25 (33.78) |
| 8. | Difficulties in securing planting material of improved varieties | 21 (36.84) | 23 (31.08) |
| 9. | Inadequate knowledge of pests and diseases | 19 (33.33) | 20 (27.02) |

(Figures in the parentheses are percentages to respective no. of farmers)

and which is presented in Table 4.

It is seen from the Table 4 that, sugarcane cultivation was found to be profitable in both suru and ratoon groups. It is observed from the table that, the per hectare sugarcane production in suru was 102.45 tons while in ratoon it was 59.90 tons. Benefit:cost ratio was 1.66 and 1.57 in suru and ratoon sugarcane, respectively.

It is revealed from the Table 4 the price realized by producer was Rs. 2200/tonne for main produce and Rs.650/tonne for by produce, for both suru and ratoon sugarcane crop, respectively. In suru sugarcane per hectare total cost was Rs. 1,43,664, while in ratoon sugarcane per hectare total cost was Rs. 88873. In suru sugarcane profitability was Rs. 1,63,286 at cost A, Rs. 1,23,109, at cost B and Rs. 95,045 at cost C while in ratoon sugarcane profitability was Rs. 91,339 at cost A, Rs. 67,874 at cost B and Rs. 50,694 at cost C. The net profit (at cost C) was Rs. 95,045 in suru sugarcane while Rs. 50,694 in ratoon sugarcane. Per tonne cost of production of suru sugarcane was Rs. 1402 while Rs. 1484 in ratoon sugarcane cultivation. Per quintal cost of production of suru sugarcane was Rs. 140 while it was Rs. 148 in ratoon sugarcane cultivation. This analysis indicated that sugarcane crop both suru and ratoon was profitable in Sindhudurg district of Maharashtra state. It was comparatively higher in suru than the ratoon crop.

Constraints experienced by farmers in sugarcane cultivation:

The information regarding the constraints experienced by farmers in sugarcane cultivation is presented in Table 5.

It is observed from Table 5 that, in suru sugarcane cultivation majority (68.42%) of the farmers stated problem of rate offered by sugarcane factories were non remunerative. Some other constraints experienced by the farmers were inadequate returns adversely affected area under sugarcane cultivation (66.47%) followed by non-availability of labour (61.40%), problem in timely and adequate availability of irrigation water from canal and river (57.89%), problem in availability of different types of fertilizer (45.61%), small size of holding (42.10), difficulties in following tillage operations (38.60%), Difficulties in securing planting material of improved varieties (36.84%) and inadequate knowledge of pests and diseases (33.33%).

In case of ratoon sugarcane cultivation majority (70.27%) of the farmers stated problem of rate offered by sugarcane factories were non-remunerative.

Some other constraints experienced by the farmers were inadequate returns adversely affected area under sugarcane (66.21%) followed by non-availability of labour (43.24%), problem in timely and adequate availability of irrigation water from canal and river (36.19%), problem in availability of different types of fertilizer (37.84%), small size of holding

(36.47%), difficulties in following tillage operations (33.78%), difficulties in securing planting material of improved varieties (31.08%) and inadequate knowledge of pests and diseases (27.02%).

In general the major constraints faced by sugarcane farmers in Sindhudurg district was in respect of per tonne rate offered by the factories for both the type of sugarcane which affect the returns and profitability of the sugarcane crop. Similar work related to the present investigation was also carried out by Samui *et al.* (2005).

Conclusion :

In suru sugarcane group per hectare cost A was Rs. 75,423, cost B was Rs. 1,15,600 and cost C was Rs. 1,43,664 while in ratoon sugarcane group per hectare cost A was Rs. 48,228, cost B was Rs. 71,693 and cost C was Rs. 88,873, respectively. The net returns in suru sugarcane group were Rs. 1,63,286, Rs. 1,23,109 and Rs. 95,045 at cost A, B and C, respectively while in ratoon sugarcane group net returns were Rs. 91,339, Rs. 67,874 and Rs. 50,694 at cost A, B and C, respectively.

The analysis of per hectare profitability of suru sugarcane and ratoon sugarcane crop indicated that cultivation of both type of sugarcane were profitable at all the levels of cost, as indicated by into benefit : cost ratio of suru sugarcane 1.66 and ratoon sugarcane 1.57. In suru sugarcane group per hectare main produce was 102.45 tonne and by produce was 20.49 tonne while in ratoon sugarcane group main produce was 59.90 tonne and by produce was 11.98 tonne.

The major constraints faced by both suru and ratoon sugarcane cultivators were non remunerative rates offered by sugarcane factories and inadequate returns adversely affected area under sugarcane.

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