

THE INPUT-OUTPUT RATIO OF GRAPES CULTIVATION: STUDY WITH SPECIAL REFERENCE TO THE DIFFERENT AGE OF VINEYARDS IN THENI DISTRICT OF TAMIL NADU

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Abstract

The present study was undertaken to compare the input-output ratio of grapes cultivation for different age of vineyard in Theni district of Tamil Nadu and to know the profitability. A sample size of 273 grape growers were selected under different age of vineyards and categorized into, upto 3 years, 4- 6 years, 7 – 10 years, 10 – 12 years and 13 to 15 years, during the period April 2013. Convenience sampling method was adopted in selecting the respondents. The farmers who cultivate the grape species Sharad is selected for the purpose, which is widely cultivated in the study area. Input-output ratio, benefit–cost ratio for the different ages of vineyard is also compared. The results show that establishment costs for vineyard per acre is found to be higher for the young vineyards due to the stones, GI wire and other labour costs than that of old vineyards and the total operating costs are found to be higher for the aged vineyards. Even though the cost share per cent is low for the aged vineyards, through which farmers gain better than young vineyards due to the gross return and establishment cost share.

Key Words: *Total Operating Cost, Input-Output Ratio, Benefit-Cost Ratio, Grape Cultivation.*

Introduction

Grape was introduced in Tamil Nadu in 1832 but only in recent years it has come to be recognized as a very lucrative crop. Certain special features lend distinctiveness to Tamil Nadu in many aspects of grape culture. In the tropical climate of the South, the vine remains evergreen, with no dormant phase as is noticed in the North. This condition renders the harvest of three crops possible in a year or five crops in two years (Shanmugavelu, 1998). India has the distinction of achieving the highest productivity in grapes in the world (Shikhamany and Sudha, 2004). Grape cultivation in India is perfected to the extent that yields upto 100 tonnes hectare have been obtained in cultivar ‘Anab-e-Shahi’ in Hyderabad region which has been acclaimed as a ‘Biological Wonder’ (Chadha and Shikhamani, 2004). The major area under grapes is confined to the tropical state namely, Karnataka, Maharashtra, Andhra Pradesh and Tamil Nadu which jointly contribute to more than 90 per cent of the total area and production of grapes in India. The grape farmers of Tamil Nadu, especially Theni district have taken to the latest practices in vineyard management and are producing quality grapes. The present study was undertaken to compare the input-output ratio of grapes cultivation for different age of vineyards in Theni district of Tamil Nadu and to know the profitability.

Methodology of the Study

The study was conducted at Theni district of Tamil Nadu, wherein, 273 grape growers were selected under different age of vineyards such as, upto 3 years, 4- 6 years, 7 – 10 years, 10 – 12 years and 13 to 15 years, during the period April 2013. Convenience sampling method was adopted in selecting the respondents. The samples are distributed block-wise, village-wise in order to achieve the research problem. The farmers who cultivate the grape species Sharad is selected for the purpose, since which is widely cultivated. The total cost of production is divided mainly into direct and indirect costs. The direct costs include the establishment of vineyard and its maintenance, whereas, the indirect costs which include the annual share of establishment cost, interest on fixed capital, working capital, and total operating costs. Input-output ratio, benefit–cost ratio for the different age of vineyards is compared. The earlier researchers, Venkateswaralu and Suryanarayana, 1978; Palaniswamy, 1978; Vijayan, 1982; Paramasivam, 1993 and Dhillon, 1994 have studied the similar pattern.

Results and Discussion

1. Establishment cost of vineyard

Establishment costs of vineyard for the different age of the vineyards in the study are compared i.e., costs of cut stone pillars, GI wire installed to erect a bower, Trench opening, costs of roots stock, irrigation, training of young vines, manures and fertilizers application etc. The results are presented in Table 1.

Table 1. Establishment costs for different age of vineyards (per acre)

| Vineyard Age | Establishment Cost (Rs.) | 'F' | 'p' |
|---------------|--------------------------|-----------|------|
| Upto 3 years | 326315.84 | 21406.185 | 0.00 |
| 4 – 6 years | 259744.17 | | |
| 7 – 9 years | 195615.07 | | |
| 10 – 12 years | 151414.15 | | |
| 13 – 15 years | 110187.33 | | |
| Total | 203204.34 | | |

Source: Primary data

The computed mean cost for establishment of vineyard and maintenance for one year for different age of vineyards are found to be Rs.3,26,315.84 for upto 3 years, Rs.2,59,744.17 for 4 – 6 years, Rs.1,95,615.07 for 7 – 9 years, Rs.1,51,414.15 for 10-12 years and Rs.1,10,187.33 for 13-15 years aged farms. It is very clear from the result that the cost of vineyard establishment per year is much differed for various period, since the cost of materials, labourers and other elements are increased year by year. Though, it is very clear to know the significant difference among the farm holding classes, the researcher has obtained the 'F' value, which is found to be 21406.185 with the 'p' value 0.00. It means there is a significant difference among the different age of vineyards in the cost of establishment for one year in the study area.

2. Total Operating Costs

The operating costs for different age of vineyards are compared and the results are presented in Table 2.

Table 2. Total Operating Cost for different age of Vineyards

| Cost Elements | Vineyard Age | | | | | Total | F | p' |
|------------------------|--------------|-------------|------------|---------------|---------------|----------|-------|------|
| | upto 3 years | 4 - 6 years | 7 -9 years | 10 - 12 years | 13 - 15 years | | | |
| Weeding cost | 9412.74 | 10921.11 | 10538.47 | 11313.63 | 11485.46 | 10763.41 | 5.755 | 0.00 |
| | (3.70) | (4.07) | (3.98) | (4.28) | (4.36) | (4.09) | | |
| Training of young vine | 13645.58 | 14347.85 | 14945.57 | 15173.25 | 15253.98 | 14718.17 | 9.357 | 0.00 |
| | (5.36) | (5.35) | (5.65) | (5.75) | (5.80) | (5.60) | | |
| Manure cost | 19529.50 | 21491.55 | 21958.12 | 22180.31 | 22468.93 | 21587.66 | 6.950 | 0.00 |
| | (7.67) | (8.01) | (8.30) | (8.40) | (8.54) | (8.21) | | |
| Fertilizer cost | 35829.14 | 38389.66 | 38633.85 | 38640.54 | 38858.32 | 38126.44 | 5.904 | 0.00 |

| | | | | | | | | |
|-------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|--------------|-------|
| | (14.07) | (14.31) | (14.60) | (14.63) | (14.77) | (14.50) | | |
| Pesticide cost | 30945.44 | 32385.96 | 32512.48 | 32975.66 | 32868.30 | 32378.09 | 6.233 | 0.00 |
| | (12.15) | (12.07) | (12.29) | (12.49) | (12.49) | (12.31) | | |
| Pruning cost | 18097.20 | 19079.47 | 18940.55 | 19064.07 | 19548.60 | 18963.66 | 4.098 | 0.00 |
| | (7.11) | (7.11) | (7.16) | (7.22) | (7.43) | (7.21) | | |
| Removal of Excess Leaves cost | 19995.96 | 21011.45 | 21032.40 | 21273.56 | 21408.23 | 20969.56 | 3.066 | 0.01 |
| | (7.85) | (7.83) | (7.95) | (8.06) | (8.14) | (7.97) | | |
| Berry Thinning cost | 19518.14 | 20741.72 | 20288.83 | 20431.44 | 20680.02 | 20338.15 | 3.446 | 0.00 |
| | (7.67) | (7.73) | (7.67) | (7.74) | (7.86) | (7.73) | | |
| Irrigation cost | 12182.68 | 13621.77 | 13651.07 | 13877.95 | 13965.26 | 13491.72 | 4.392 | 0.00 |
| | (4.78) | (5.08) | (5.16) | (5.26) | (5.31) | (5.13) | | |
| Harvesting cost | 18129.60 | 18044.55 | 16499.13 | 14924.05 | 13783.68 | 16156.45 | 58.06 3 | 0.00 |
| | (7.12) | (6.72) | (6.24) | (5.65) | (5.24) | (6.14) | | |
| Labour cost (overall) | 22280.94 | 24436.57 | 24391.67 | 24645.46 | 24874.12 | 24168.40 | 5.357 | 0.00 |
| | (8.75) | (9.11) | (9.22) | (9.33) | (9.45) | (9.19) | | |
| Total Operating Cost | 219566.92 | 234471.66 | 233392.13 | 234499.92 | 235194.89 | 231661.71 | 3.207 | 0.01 |
| | (86.24) | (87.38) | (88.21) | (88.81) | (89.37) | (88.09) | | |
| Cost on Working Capital | 21956.69 | 23447.17 | 23339.21 | 23449.99 | 23519.49 | 23166.17 | 3.207 | 0.01 |
| | (8.62) | (8.74) | (8.82) | (8.88) | (8.94) | (8.81) | | |
| Establishment Cost Share | 13052.63 | 10389.77 | 7824.60 | 6056.57 | 4407.49 | 8128.17 | 2140 6.19 | 0.00 |
| | (5.13) | (3.87) | (2.96) | (2.29) | (1.67) | (3.09) | | |
| Total Production Cost | 254611.25 | 268343.59 | 264590.95 | 264041.47 | 263156.88 | 262991.05 | 1.477 | 0.209 |
| | (100.00) | (100.00) | (100.00) | (100.00) | (100.00) | (100.00) | | |

Source: Primary data

The result shows in Table-2 that cost of weeding, training of youngvine, manuring, fertilization, pesticide, pruning, removal of excess leaves, berry thinning and cost of irrigation are relatively higher for the aged vineyards and thereby the labour cost, total operating cost, cost on working capital are higher for aged vineyards. Whereas, the cost of harvesting and cost share for one year establishment is lower for the aged vineyards. It is very clear from this result that cost share for lower aged vineyards are higher than the old aged vineyards. Further the researchers have applied the 'F' – test and the obtained 'F'-value is found to be statistically significant at the 0.01 level except total production cost. The total production costs are found to be Rs.2,54,611.25 for upto 3 years, Rs.2,68,343.59 for 4-6 years, Rs.2,64,590.95 for 7-9 years, Rs.2,64,041.47 for 10-12 years, Rs.2,63,156.88 for 13-15 years and aged vineyard and Rs.2,62,991.05 for the overall vineyard operating cost for three crops in a year. The total production costs for the different age of vineyards have no much difference since the obtained 'F' value is found to be 1.477 with 'p' value 0.209. Hence, it may be concluded that there is no much difference besides the different age of vineyards.

3. Cost and Return Structure of Grapes

The total Cost of Production, Gross Return per acre, input-output ratio, benefit-cost ratio is compared among the different age of farmyards and the results are presented in Table 3.

Table 3. Cost and Return Structure of different age of vineyards

| Cost Elements | Vineyard Age | | | | | Total | ‘F’ | ‘p’ |
|----------------------------------|--------------|-------------|------------|---------------|---------------|-----------|----------|------|
| | upto 3 years | 4 - 6 years | 7 -9 years | 10 - 12 years | 13 - 15 years | | | |
| Total Operating Cost | 219566.92 | 234471.66 | 233392.13 | 234499.92 | 235194.89 | 231661.71 | 3.207 | .014 |
| Cost on Working Capital | 21956.69 | 23447.17 | 23339.21 | 23449.99 | 23519.49 | 23166.17 | 3.207 | .014 |
| Establishment Cost Share | 13052.63 | 10389.77 | 7824.60 | 6056.57 | 4407.49 | 8128.17 | 21406.19 | .000 |
| Total Production Cost | 254611.25 | 268343.59 | 264590.95 | 264041.47 | 263156.88 | 262991.05 | 1.477 | .209 |
| Gross Return | 725919.40 | 712132.57 | 649461.20 | 581991.27 | 525085.77 | 633704.20 | 198.181 | .000 |
| Net Return Over Cost (A) | 506352.48 | 477660.91 | 416069.07 | 347491.36 | 289890.88 | 402042.49 | 245.068 | .000 |
| Net Return Over Cost (C) | 471308.15 | 443788.98 | 384870.25 | 317949.80 | 261928.89 | 370713.15 | 220.992 | .000 |
| Input-Output Ratio Over Cost (A) | 3.35 | 3.06 | 2.81 | 2.50 | 2.26 | 2.77 | 116.662 | .000 |
| Input-Output Ratio Over Cost (C) | 2.89 | 2.67 | 2.48 | 2.22 | 2.02 | 2.43 | 102.063 | .000 |
| Cost-Benefit Ratio (C) | .35 | .38 | .41 | .45 | .50 | .42 | 89.246 | .000 |

Source: Primary data.

The Table 3 presents input-output structure per acre among the different age of vineyards. The overall input-output ratio per acre in terms of operational cost (A) is found to be Rs.3.35 for the upto 3 years vineyards, Rs.3.06 for 4-6 years vineyards, Rs.2.81 for 7 – 9 years vineyards, Rs.2.50 for 10-12 years vineyards, Rs.2.26 for 13-15 years vineyard and Rs.2.77 for overall vineyards. The result indicates that over a rupee spent on grapes cultivation in the study area, the upto 3 years aged vineyards have a return of Rs.3.35 when, the 13-15 years aged vineyards have the minimum return of Rs.2.26. The new vineyards help to earn higher profit by investing lesser amount than old aged vineyards. Similar findings have been obtained by Iyyampillai and Balamurugan (2007). Hence, it may be observed that cultivation of grapes crop is more beneficial to the farms holding comparatively other crops particularly in the study area.

While computing the Input-Output Ratio in terms of the Total Cost of Production (cost C), it is obtained to be Rs.2.89 has been earned by the upto 3 years aged vineyards while comparing higher aged vineyards.

By considering the cost ratios cost (A) and cost (C) among the different age of vineyards, are obtained to be statistically significant. This result indicates that eventhough the cost share per cent is more for the aged

vineyards, gained lesser profit than young vineyards since, input of fertilizers, manures, weed management, application of pesticides are more than young vine.

Further to know statistical difference among the different age of vineyards on input-output ratio with respect to the Operational Cost (cost A) 'F' test has been applied. The obtained 'F' value is found to be 116.62, which is significant at the 0.01 level. Hence, the result reveals that the net return per acre obtained by investing one rupee of investment on operating cost according to the different age of vine yard is having significant difference since the total income and operational cost is differed significantly among them.

The Input-Output Ratio with respect to the Total Production Cost (Cost C) is differed significantly among different age of vineyards. The significant difference among the various farms holding classes on input-output ratio cost-C is found due to the gross return per acre obtained by the young yards comparatively higher than aged vineyards. Further, this result is ascertained by using resource use efficiency (cost benefit ratio) (C/B ratio). Hence, it could be noted that the benefit gained by the aged vineyard is comparatively higher at the Rs. 0.50, Rs. 0.45 for 13-15 years and 10-12 years vineyards, Rs. 0.41 for 7-9 years, Rs.0.38 for 4-7 years and Rs. 0.35 for upto 3 years vineyards. Further the 'F' value is found to be 89.246 which is significant at the 0.01 level among the age of vineyards.

Thus, there is a significant difference among the different age of vineyards on input-output ratio (Cost-C) and cost-benefit ratio (Cost –C) for the overall, which has been occurred mainly due the influence of variations in gross return per acre, soil and climatic conditions, intake power of vineyards etc. though the total cost on production has not equal among the age of vineyards.

Conclusion

The study was undertaken to know the Cost and Return structure among the different age of vineyards at Theni district of Tamil Nadu. The results show that the establishment costs for vineyard per acre is found to be higher for the young vineyards due to the stones, GI wire and other labour costs than that of old vineyards and the total operating costs are found to be higher for the aged vineyards. Even though the cost share per cent is low for the aged vineyards, through which farmers gain better than young vineyards due to the gross return and establishment cost share. The researchers point-out that the farmers should identify the right season of harvest as well as the market conditions in order to gain more profit.

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