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# The input-output ratio of grapes cultivation among the different sizes of farm holding classes 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 among the different sizes of farm holding classes in Theni district of Tamil Nadu and to know their profitability as well as efficiency. A sample size of 273 grape growers were selected under different sizes of farm holding classes namely, marginal, small, medium and large, 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 among the different sizes of farm holding classes are also compared. The results show that the establishment costs for vineyard per acre is found to be higher for the medium and large farms and the total operating costs are found to be higher for the large farms. Even though the cost share per cent is more for the medium and large farms and gained lesser profit than marginal and small farms due to the gross return the large farms have gained much profit than marginal and small farms. But due to the gross return the large farms have gained much profit than marginal and small farms.

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### Introduction

Grape is one of the finest and the most strength-giving food. It contains many valuable elements necessary for a healthy life. In addition, it has commendable medicinal qualities, and has been used in nature-therapy for centuries. 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 among the different sizes of farm holding classes in Theni district of Tamil Nadu and to know their profitability as well as efficiency.

### Methodology of the study

The study was conducted at Theni district of Tamil Nadu, wherein, 273 grape growers were selected under different sizes of farm holding classes namely, marginal, small, medium and large, 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 among the different sizes of farm holding classes are also 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

#### Establishment cost of vineyard

Establishment of vineyard costs among the different size of farm holding classes 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 of vineyard per acre among the different sizes of farm holding classes**

Farmer Type	Establishment Cost (Rs.)	'F'	'p'
Marginal	234439.20	0.011	0.998
Small	241705.50		
Medium	238859.50		
Large	239106.70		
<b>Total</b>	<b>238527.73</b>		

**Source:** Primary data

The computed mean cost for establishment of vineyard and maintenance for one year for different farm holding classes are to be Rs.2,34,439.20 for marginal farms, Rs.2,41,705.50 for small farms, Rs.2,38,859.50 for medium farms, Rs.2,39,9106.70 for large farms. It is very clear from the result that the farmer-wise the establishment of vineyard cost is not much differed among them, although the cost is slightly higher for small farmers and followed by large, medium and marginal. 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 0.011 with the 'p' value 0.998. It means

there is no significant difference among the different farm holding classes on establishment of vineyard for one year in the study area.

#### **Total Operating Costs**

The different costs include in this stage for the different sizes of farm holding classes namely, marginal, small, medium and large are compared and the results are presented in Table 2.

The Table-2 represents production cost elements of grapes cultivation among the different sizes of farm holding classes. The total operating costs and production costs are compared among the different farm holding classes. The operating cost elements such as, the weeding, Training of young vine, Manuring, Fertilization, Pesticide application, Pruning, Removal of Excess Leaves, Berry Thinning, Irrigation, Harvesting, Labour cost (overall), Total Operating Cost, Cost on Working Capital Establishment Cost Share, Total Production Cost. The marginal farmers have controlled the cost elements effectively than other farm holding classes. The total operating cost for the different sizes of farm holding classes are found to be Rs.1,96,431.26 for marginal, Rs.2,25,860.56 for small, Rs.2,55,439.46 for medium, Rs.2,79,774.37 for large and Rs.2,31,661.71 for the overall farm holding classes. The result shows that marginal and small farms have spent 87.83 per cent and 87.97 per cent respectively on total operating cost. Further to know the significant difference among the different sizes of farm holding classes 'F'-test was applied and the obtained 'F' value is found to be 1364.476 with 'p' value 0.00. It means there is a 0.01 level significant difference among the various farm holding classes. It is found this study the result that cost share of vineyard establishment for first year has no significant difference among the different sizes of farm holding classes. The total production cost for one year (i.e., cost of three crops for one year) is compared and the result shows that marginal farmers have spent Rs.2,23,650.88, small farmers have spent Rs.2,56,750.10, medium farmers have spent Rs.2,91,199.23 and large farmers have spent Rs.3,16,610.77. The average total production cost among the farms are found to be Rs.2,62,991.05 per acre. From this result it is known that the total production cost is too high for the medium and large, whereas, the marginal and small have control effectively. Further to know the significant difference among the farms 'F' test was applied and the obtained 'F' value is found to be 3834.117, with 'p' value 0.000. It means there is a significant difference among the difference farm holding classes at the 0.01 level on total production cost for one year per acre.

#### **Cost and Return Structure of Grapes**

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

The Table 3 presents input-output structure per acre among the farm holding classes among the different sizes of farm holding classes. The overall input-output ratio per acre in terms of operational cost (A) is found to be Rs.3.09 for the marginal farms, Rs.2.79 for medium farms, Rs.2.71 for small farms and Rs.2.19 for the large farms. The result indicates that over a rupee spent on grapes cultivation in the study area, the marginal farms have obtained a return of Rs.3.09 when, the large farms have obtained the minimum return of Rs.2.19. The marginal, small and medium farms have earned higher profit by investing lesser amount than large farms 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.2.70 has been earned by the marginal farms while comparing other farm holding classes, the total cost of production are Rs.2.38 for small farms, Rs.2.46 for medium farms, and Rs. 1.93 for the large farms over a rupee spent on grapes cultivation.

By considering the cost ratios cost (A) and cost (C) among the farm holding classes, are obtained to be statistically significant. This result indicates that eventhough the cost share per cent is more for the medium and large farms and gained lesser profit than marginal and small farms since, they could not concentrate and monitor input of manures and fertilizers, weed management, application of pesticide periodically, irrigation problem due to large land holding and deploying human labour, etc.

Further to know statistical difference among the farm holding classes 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 17.864, which is significant at the 0.01 level. Hence, the result reveals that the net return per acre obtained be investing one rupee of investment on operating cost according to the different farm holding classes 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 the farm holding classes. 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 medium farms is comparatively higher than other farms holding classes. 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 large farm is comparatively higher at the Rs. 0.53, Rs. 0.43 for small, Rs. 0.41 for medium and Rs. 0.38 for marginal farms. Further the 'F' value is found to be 41.572 which is significant at the 0.01 level among the farm holding classes.

Thus, there is a significant difference among the farm holding classes on input-output ratio (Cost-C) and cost-benefit ratio (Cost -C) for the pooled farms, which has been occurred mainly due the influence of variations in gross return per acre, though the total cost on production has not equal among the farm holding classes.

#### **Conclusion**

The study was undertaken to know the Cost and Return structure among the different sizes of farm holding classes at Theni district of Tamil Nadu. The results show that the establishment costs for vineyard per acre is found to be higher for the large farms large farms and the total operating costs are found to be higher for the large farms. Even though the cost share per cent is more for the medium and large farms and gained lesser profit than marginal and small farms due to the gross return the large farms have gained much profit than marginal and small farms. Hence, it is implied from this study that the small and medium farm holding classes have obtained better results on their grapes cultivation practices. The researchers point-out that the policy makers have to understand the fluctuations in the pricing of grapes, and to extend the supports to the farmers to increase the maximum sustainable production of grapes.

**Table 2. Total Operating cost of vineyard among the different sizes of farm holding classes.**

Farmer Type	Marginal	Small	Medium	Large	Total	F	p'
Weeding cost	8120.31 (3.63)	9686.22 (3.77)	13146.59 (4.55)	15504.44 (4.90)	10763.41 (4.09)	631.070	.000
Training of young vine	12289.03 (5.49)	14972.21 (5.83)	15733.03 (5.44)	16918.78 (5.34)	14718.17 (5.60)	282.678	.000
Manure cost	17635.83 (7.89)	20647.94 (8.04)	24596.07 (8.50)	27311.30 (8.63)	21587.66 (8.21)	567.717	.000
Fertilizer cost	32810.49 (14.67)	37677.09 (14.67)	41505.36 (14.35)	44153.04 (13.95)	38126.44 (14.50)	754.343	.000
Pesticide cost	29388.97 (13.14)	31822.71 (12.39)	34319.67 (11.87)	36916.07 (11.66)	32378.09 (12.31)	656.182	.000
Pruning cost	16562.62 (7.41)	18490.65 (7.20)	20677.39 (7.15)	22326.48 (7.05)	18963.66 (7.21)	785.058	.000
Removal of Excess Leaves cost	18164.06 (8.12)	20311.18 (7.91)	22986.83 (7.95)	25299.33 (7.99)	20969.56 (7.97)	1020.739	.000
Berry Thinning cost	18016.35 (8.06)	19742.88 (7.69)	22208.91 (7.68)	23616.04 (7.46)	20338.15 (7.73)	1150.390	.000
Irrigation cost	10506.06 (4.70)	12857.88 (5.01)	15209.94 (5.26)	18917.70 (5.98)	13491.72 (5.13)	919.539	.000
Harvesting cost	13215.31 (5.91)	15966.75 (6.22)	18215.94 (6.30)	18760.74 (5.93)	16156.45 (6.14)	146.573	.000
Labour cost (overall)	19722.23 (8.82)	23685.04 (9.22)	26839.72 (9.28)	30050.44 (9.49)	24168.40 (9.19)	769.312	.000
Total Operating Cost	196431.26 (87.83)	225860.56 (87.97)	255439.46 (88.33)	279774.37 (88.37)	231661.71 (88.09)	1364.476	.000
Cost on Working Capital	19643.13 (8.78)	22586.06 (8.80)	25543.95 (8.83)	27977.44 (8.84)	23166.17 (8.81)	1364.476	.000
Establishment Cost Share	7541.50 (3.37)	8268.49 (3.22)	8180.82 (2.83)	8823.96 (2.79)	8128.17 (3.09)	1.373	.251
Total Production Cost	223650.88 (100.00)	256750.10 (100.00)	289199.23 (100.00)	316610.77 (100.00)	262991.05 (100.00)	3834.117	.000

Source: Primary data

**Table 3. Cost and Return Structure of Grapes among the different sizes of farm holding classes**

Farmer Type	Marginal	Small	Medium	Large	Total	'F'	'p'
Total Operating Cost	196431.26	225860.56	255439.46	279774.37	231661.71	1364.476	.000
Cost on Working Capital	19643.13	22586.06	25543.95	27977.44	23166.17	1364.476	.000
Establishment Cost Share	7541.50	8268.49	8180.82	8823.96	8128.17	1.373	.251
Total Production Cost	223650.88	256750.10	289199.23	316610.77	262991.05	3834.117	.000
Gross Return	602956.00	609944.92	710075.58	611113.37	633704.20	31.377	.000
Net Return Over Cost (A)	406524.74	384084.36	454636.12	331339.00	402042.49	17.864	.000
Net Return Over Cost (C)	379305.12	353194.82	420876.35	294502.60	370713.15	19.206	.000
Input-Output Ratio Over Cost (A)	3.09	2.71	2.79	2.19	2.77	30.704	.000
Input-Output Ratio Over Cost (C)	2.70	2.38	2.46	1.93	2.43	35.175	.000
Cost-Benefit Ratio (C)	0.38	0.43	0.41	0.53	0.42	41.572	.000

Source: Primary data

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