ISSN Print: 2664-844X
ISSN Online: 2664-8458
NAAS Rating (2025): 4.97
IJAFS 2025; 7(8): 1225-1227
www.agriculturaljournals.com
Received: 07-06-2025
Accepted: 11-07-2025

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Economic analysis of banana in Solapur district of Maharashtra

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DOI: https://www.doi.org/10.33545/2664844X.2025.v7.i8l.695

Abstract
The present investigation is carried out in Solapur district of Maharashtra state. Keeping in view the highest acreages under banana, Madha and Karmala tahsils from Solapur district were purposively selected. from these two tahsils 6 villages were selected purposively on the basis of area under banana. from each village 15 sample cultivators were selected randomly i.e. small (Upto 0.40 ha), medium (0.41 to 0.80 ha) and large (0.81 ha and above). Thus, final sample comprised of 90 banana cultivators. The primary data collected for the agriculture year 2023-24 were analysed by using simple tabular approach and also functional analysis method. At overall level per hectare cost of production was 4,86,073.99. The per hectare cost of production was highest 4,98,616.88 in small size group followed by medium 4,86,784.66 and large group 4,72,820.42. Banana is a profitable fruit crop with 1.77 B:C ratio. For Large cultivator cost was minimum Hence, the large cultivators were more profitable than small cultivators. According to financial indicators, the investment in banana cultivation has proven to be economically viable.

Keywords: Cost of cultivation, returns, profitability, cost A, cost B, cost C, Banana

Introduction
India has diverse and varied Agri-climatic conditions i.e. temperate to tropical, which are highly favourable and conductive to production of agriculture and horticulture crops. India is an agriculture country and agriculture is an engine of economic growth and development. Due to its dominance in rural life, agriculture continues to be the backbone of our economy. Agriculture constitutes the main source of employment of the majority of the world's poor. Agriculture in India has a long history, dating back to ten thousand years.
Banana (*Musa paradisiaca*) belongs to family Musaceae. Banana is herbaceous flowering plants in the genus Musa. It has large, flexible, and waterproof leaves. The banana "stem" is a pseudo stem, a false stem formed by the tightly wrapped leaf sheaths. It's a crucial part of the plant, providing support and housing the developing flower spike (inflorescence). The banana inflorescence, which is also known as "banana blossom", "banana flower" or "banana heart", is a large, dark purple-red, heart-shaped structure that emerges from the top of the pseudo stem.
The specific objective of the study is to assess the to study the cost and returns in the production and marketing of banana in the study area.

Materials and Methods
Solapur district is one of the bananas growing district of Maharashtra. The Solapur district was purposively selected for the study. Two tahsils Madha and Karmala tahsils of Solapur district contributes major part of area under banana. Therefore, these two tahsils selected for the study. Three villages from each tahsil were selected on the basis of maximum area under banana. Thus, in all 6 villages were selected from these tahsils. Total 90 samples were selected for study.

Tools of Analysis
Estimation of Production Costs and Returns: The production costs and returns of banana production were estimated on the basis of per hectare. The standard cost concept was used

and *viz*. cost 'A', cost 'B' and cost 'C' were worked out. The sample statistical tools *viz*. percentages and averages were used.

Result and Discussion

Cost of Cultivation of Banana

The cost of cultivation represents the total expenditure incurred to banana cultivators. This total includes both fixed and variable costs. The cost of cultivation of banana growers presented in table 1.

Table 1: Cost of Cultivation of Banana Cultivators (₹/ ha)

Sr. No	Cost items	Small			Medium			Large			Overall		
		qty	Rate	value	qty	Rate	value	qty	Rate	value	qty	Rate	value
I) 1	**Hired Human labour (Man days)**												
	a) Male	40.38	500.00	20189.43 (4.05)	32.46	500.00	16229.28 (3.33)	30.54	500.00	15268.52 (3.23)	34.46	500.00	17229.08 (3.54)
	b) Female	67.00	300.00	20099.70 (4.03)	57.69	300.00	17306.63 (3.56)	57.22	300.00	17166.67 (3.63)	60.64	300.00	18191.00 (3.74)
2	Bullock power (pair days)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	Machine (Hrs)	15.00	800.00	12000.00 (2.41)	14.60	800.00	11677.72 (2.40)	13.43	800.00	10740.74 (2.27)	14.34	800.00	11472.82 (2.36)
4	Seedlings (No)	3500	19.05	66634.35 (13.36)	3600.71	17.72	63818.83 (13.11)	3717.59	16.47	61188.89 (12.94)	3606.10	17.74	63880.69 (13.14)
5	Manures (Qtls.)	350.00	150.00	52500.00 (10.53)	360.07	150.00	54010.70 (11.10)	371.76	150.00	55763.89 (11.79)	360.61	150.00	54091.53 (11.14)
6	**Fertilizers (Kg)**												
	N	546.73	28.19	15350.65 (3.08)	555.44	28.19	15595.19 (3.20)	445.55	28.19	12509.82 (2.65)	515.90	28.19	14485.22 (2.98)
	P	227.92	53.90	12278.39 (2.46)	231.55	53.90	12473.99 (2.56)	192.62	53.90	10376.72 (2.19)	217.36	53.90	11709.70 (2.41)
	K	861.91	50.74	43736.73 (8.77)	875.64	50.74	44433.46 (9.13)	749.23	50.74	38018.89 (8.04)	828.93	50.74	42063.03 (8.65)
7	Micronutrients	23.40	167.50	15905.86 (3.19)	52.14	167.50	14982.46 (3.08)	133.83	167.50	14540.19 (3.08)	69.79	167.50	15142.83 (3.11)
8	Irrigation Charges (₹.)			12642.98 (2.54)			12089.52 (2.48)			9816.36 (2.08)			11516.29 (2.37)
9	Plant protection charges (₹.)			18550.00 (3.72)			18025.00 (3.70)			17575.00 (3.72)			18050.00 (3.71)
11	Incidental charges (₹.)			698.90 (0.14)			829.01 (0.17)			1415.80 (0.30)			981.24 (0.20)
12	Repair charges (₹.)			465.60 (0.09)			475.32 (0.10)			755.74 (0.16)			565.56 (0.12)
	Working capital (₹.)			291052.60 (58.37)			281947.11 (57.92)			265137.21 (56.08)			279378.97 (57.46)
13	Int. on Working Capital @ 6per cent (₹)			17463.16 (3.50)			16916.83 (3.48)			15908.23 (3.36)			16762.74 (3.45)
14	Depre. on farm implements (₹.)			964.86 (0.19)			1144.10 (0.24)			1078.79 (0.23)			1062.58 (0.22)
15	Land revenue and taxes (₹.)			132.42 (0.03)			135.00 (0.03)			135.00 (0.03)			134.14 (0.03)
	Cost 'A'			309613.03 (62.09)			300143.03 (61.66)			282259.24 (59.70)			297338.43 (61.15)
16	Rental value of land (₹.)			140840.36 (28.25)			141895.82 (29.15)			147825.51 (31.26)			143520.56 (29.55)
17	Int. on fixed capital @10per cent (₹)			14923.22 (2.99)			14704.38 (3.02)			13461.60 (2.85)			14363.07 (2.95)
	Cost 'B'			465376.61 (93.33)			456743.22 (93.83)			443546.35 (93.81)			455222.06 (93.66)
18	**Family labour (Man days)**												
	a. Male	32.20	500.00	16101.69 (3.23)	28.87	500.00	14433.70 (2.97)	29.26	500.00	14629.63 (3.09)	30.11	500.00	15055.01 (3.10)
	b. Female	57.13	300.00	17138.58 (3.44)	52.03	300.00	15607.73 (3.21)	48.81	300.00	14644.44 (3.10)	52.66	300.00	15796.92 (3.25)
	Cost 'C'			498616.88 (100.00)			486784.66 (100.00)			472820.42 (100.00)	0.00	0.00	486073.99 (100.00)
II	Output (qtls.) and income (₹.)	413.26	2046.74	845836.66	417.13	2042.99	852184.89	424.35	2092.4	887763.04	418.25	2060.59	861928.20
III	Per quintal cost			1206.54			1166.99			1114.22			1162.59
	B:C Ratio			1.70			1.75			1.88			1.77

It is revealed that cultivators of small size incurred the highest cost C at ₹4,98,616.88, followed by medium size cultivators at ₹4,86,784.66 and large size cultivators at ₹4,72,820.42. The average cost C across all sizes was ₹4,86,073.99. Among the various cost components at the overall level, the rental value of land was the largest expense, amounting to 29.55 per cent, followed by fertilizer 14.04 percent, suckers 13.14 per cent, manure 11.14 per cent and hired human labour charges 7.28 per cent.

The small size group, the cost of nitrogen fertilizers was ₹15,350.65(3.08 per cent), which slightly increased to ₹15,595.19 (3.20 per cent) in the medium size but decreased to ₹12,509.82 (2.65 per cent) in the large size. Phosphorus fertilizers accounted for 2.46 per cent of cost C in the small size, 2.56 per cent in the medium size and 2.19 per cent in

the large size, averaging 2.41 per cent overall. Potassium fertilizer costs constituted 8.77 per cent in the small size, 9.13 per cent in the medium size and 8.04 per cent in the large size, with an overall average of 8.65 per cent. Bullock labour was not utilized in banana cultivation, as all values were zero. Machine power and suckers use was highest in small size group followed by medium and small size group.

Irrigation charges were ₹12,642.98, ₹12,089.52 and ₹9,816.36 for small, medium and large cultivators, respectively, with an overall average of ₹11,516.29 (2.37 per cent of cost C). Plant protection charges were ₹18,550 for small, ₹18,025 for medium and ₹17,575 for large cultivators, averaging ₹18,050 (3.71 per cent of cost C).

Working capital requirements were ₹2,91,052.60, ₹2,81,947.11 and ₹2,65,137.21 for small, medium and large cultivators, respectively, with an overall average of ₹2,79,378.97, accounting for 57.46 per cent of cost C.

Cost A was found to be ₹3,09,613.03, ₹3,00,143.03, ₹2,82,259.24 for small, medium and large cultivators, respectively. averaging ₹2,97,338.43, which comprised 61.15 per cent of cost C. Cost C was found maximum in small cultivators (₹ 4,98,616.88) followed by medium size cultivators (₹4,86,784.66) and large size cultivators (₹4,72,820.42). Overall, cost C was ₹ 4,86,073.99. As the size group increased, the cost of cultivation shown decreased trend as like return to scale.

The per quintal cost of banana production was ₹1,206.54, ₹1,166.99 and ₹1,114.22 for small, medium and large cultivators respectively, with an overall average cost of ₹1,162.59. The benefit cost ratio was highest in large (1.88) size group followed by medium (1.75) and small (1.70) size group

Cost and Returns Structure of Banana Cultivators

The cost and return structure depicted in table 2. Among the different size group per ha yield of banana was highest in large size group followed by medium and small size groups and gross income also shows similar trend.

Table 2: Cost and Returns Structure of Banana Cultivators (₹/ha)

Sr. No.	Particulars	Unit	Size groups			Overall
			Small	Medium	Large	
1.	**Total cost**					
	i) Cost 'A'	₹	309613.03	300143.03	282259.24	297338.43
	ii) Cost 'B'	₹	465376.61	456743.22	443546.35	455222.06
	iii) Cost 'C'	₹	498616.88	486784.66	472820.42	486073.99
2.	**Profit at**					
	i) Cost 'A'	₹	536223.63	552041.86	605503.80	564589.76
	ii) Cost 'B'	₹	380460.05	395441.67	444216.69	406706.14
	iii) Cost 'C'	₹	347219.77	365400.23	414942.62	375854.21
3	Production	qtl.	413.26	417.13	424.35	418.25
4	Gross income	₹	845836.66	852184.89	887763.04	861928.20
5	**B:C ratio**					
	i) Cost 'A'		2.73	2.84	3.15	2.91
	ii) Cost 'B'		1.82	1.87	2.00	1.89
	iii) Cost 'C'		1.70	1.75	1.88	1.77

The profit at cost C was found to be ₹3,47,219.77 for small, ₹3,65,400.23 for medium and ₹4,14,942.62 for large farms. At the overall level, the profit at cost C ₹3,75,854.21.

At the overall level benefit cost ratio was 1.77 which indicates that if banana grower has invested one rupee in banana cultivation, he will get 1.77 rupees. As the benefit cost ratio is greater than unity indicated that banana crop is profitable and gets sufficient income to the banana growers.

Conclusion

The total cost of cultivation was found to be highest for small farmers (₹4,98,616.88), followed by medium farmers (₹4,86,784.66), and lowest for large farmers (₹4,72,820.42). This indicates that larger farmers benefit from economies of scale, where the cost per unit of production declines as farm size increases. Large farms are able to distribute fixed costs across a larger cultivated area. Small farms face higher average costs because their fixed costs are spread over a smaller area.

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