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Economics of production and marketing of guava in Satara District of Maharashtra

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Abstract
The present investigation is carried out in Satara district of Maharashtra state. Keeping in view the highest acreages under guava grown in tahsils Phaltan and Man from Satara district were purposively selected. From these two tahsils, 6 villages were selected purposively on the basis of area under guava crop, such that from each village 15 sample growers were selected randomly on basis of small (upto 0.20 ha), medium (0.21 to 0.40 ha) and large (0.41 ha and above) area under crop. Thus, final sample comprised of 90 guava growers. The primary data collected for the agriculture year 2023-24 were analyzed by using simple tabular approach and also functional analysis method. At overall level, per hectare cost of production was (5,04,930.94.) Meanwhile, per hectare cost of production was highest (5,24,853.77) in large size group followed by small (4,97,287.35) and medium group (4,92,651.70). Guava is a profitable fruit crop with (2.37) B:C ratio. Profit was maximum for large farmers groups. Hence, the large farmers were more profitable than small farmers. According to financial indicators, the investment in guava cultivation has proven to be economically viable

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

Introduction
Fruit cultivation plays a vital role in enhancing national wealth, improving health and ensuring farmers' income security. According to the PLFS (2023–24), nearly 45.76% of India's workforce is engaged in agriculture. Fruits and vegetables provide three to four times higher returns than cereals and are the main dietary sources of vitamins and minerals. However, per capita fruit consumption in India remains only 46 g/day, compared to the recommended 92 g/day. Rising demand has led many farmers to shift toward horticulture crops like mango, banana, citrus, guava, pineapple and pomegranate.

Guava (*Psidium guajava* L.) is one of India's most important fruit crops, ranking fourth after banana, mango and citrus. Rich in vitamin C, pectin, calcium and phosphorus, it has strong nutritional and processing value. Cultivated across states such as Uttar Pradesh, Madhya Pradesh, Maharashtra and West Bengal, India grows improved varieties like Taiwan Pink, VNR Bihi, Lucknow 49 and Allahabad Safeda. Guava cultivation in India expanded from 235.60 thousand ha in 2012–13 to 357.60 thousand ha in 2023–24, while production rose from 3197.90 to 5262.70 thousand MT. Uttar Pradesh leads with 1049.82 thousand MT (productivity 19.50 T/ha), followed by Madhya Pradesh and Andhra Pradesh. Maharashtra ranks fifth in production with 257.86 thousand MT (productivity 12.64 T/ha).

Maharashtra is among the top guava-producing states, with Satara being a major growing district. Farmers here cultivate varieties like Taiwan Pink, VNR Bihi and Lucknow 49 often using fewer chemical sprays. Successful examples show that one-acre guava farms can generate lakhs in income. Key guava-producing tahsils include Phaltan, Man, Satara and Wai.

Materials and Methods
Satara district is one of the guava growing district of Maharashtra. The Satara district was purposively selected for the study. Two tahsils Phaltan and Man tahsils of Satara district contributes major part of area under guava. Therefore these two tahsils selected for the study. Three villages from each tahsil were selected on the basis of maximum area under guava.

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 guava production were estimated on the basis of per hectare The standard cost concept were used and *viz*. cost 'A', cost 'B' and cost 'C' were worked out. The sample statistical tools *viz*. percentages and averages were used.

Results and Discussion

Cost of Cultivation of Guava

The per hectare cost of cultivating Guava for various farm size groups, as well as the overall average, is presented in Table 1.

Table 1: Table presents cost structure and returns of crop production across farmer groups. (₹/ ha)

Sr. No.	Items of cost	Groups											
		I			II			III			Overall		
		Qty	Value	Per cent	Qty	Value	Per cent	Qty	Value	Per cent	Qty	Value	Per cent
1	Hired Human labour												
	(Man days)												
	a) Male	85.45	34178.08	6.87	88.33	35330.14	7.17	87.42	34967.03	6.66	87.06	34825.09	6.9
	b) Female	146.4	36601.03	7.36	149.09	37272.73	7.57	130.99	32747.25	6.24	142.16	35540.34	7.04
2	Bullock power (pair days)	0	0	0	0	0	0	0	0	0	0	0	0
	Machine	9.16	7328.77	1.47	10.9	8719.62	1.77	11.7	9361.32	1.78	10.59	8469.9	
3	Manures (q)	167.98	16797.95	3.38	157.89	15789.47	3.2	156.59	15659.34	2.98	160.82	16082.25	3.19
4	Fertilizers (kg)												
	N	314.22	8955.6	1.8	316.08	8955.6	1.82	310.54	8850.88	1.69	313.61	8920.69	1.77
	P	297.54	16371.05	3.29	299.3	16468.18	3.34	294.06	16179.63	3.08	296.97	16339.62	3.24
	K	263.79	12031.92	2.42	294.84	13448.11	2.73	297.95	13589.98	2.59	285.53	13023.34	2.58
5	Irrigation Charges (Rs.)		12743.1	2.56		10508.88	2.13		11242.92	2.14		11498.3	2.28
6	Plant protection charges (Rs.)		9039.5	1.82		9750.35	1.89		8654.3	1.75		9148.05	1.81
	foam mesh netting		89250.32	17.95		88657.95	18		90685.35	17.28		89531.21	17.73
7	Incidental charges (Rs.)		1273.97	0.26		1656.84	0.34		1588.85	0.3		1506.55	0.3
8	Repairs(Rs.)		948.63	0.19		1028.9	0.21		997.36	0.19		991.63	0.2
	Working capital (Rs.)		156269.6	31.42		158928.8	32.17		153838.9	29.41		156345.8	30.96
9	Int.on Working Capital @ 6% (Rs.)		14731.01	2.96		14302.51	2.9		14531.33	2.77		14521.62	2.88
10	Depre. on farm		1811.43	0.36		1669.07	0.34		1465	0.28		1648.5	0.33
	implements												
11	Land revenue and taxes		150	0.03		150	0.03		150	0.03		150	0.03
	Cost 'A'		262209.4	52.73		254496.8	51.66		258336	49.22		258347.4	51.16
12	Rental value of land		187649.66	37.73		189519.4	38.47		220430.68	42		199199.93	39.45
13	Int .on fixed capital @ 10% (Rs)		25404.11	5.11		25939.33	5.27		25523.68	4.86		25622.37	5.07
14	Amortization cost (Rs)		11037.52	2.22		11428.14	2.32		11426.03	2.18		11297.23	2.24
	Cost 'B'		485900.4	97.71		481383.8	97.71		515716.4	98.26		494333.5	97.9
15	**Family labour**												
	a. Male	17.98	7191.78	1.45	17.22	6889.95	1.4	14.67	5868.13	1.12	16.62	6649.95	1.32
	b. Female	16.78	4195.21	0.84	17.51	4195.21	0.85	13.08	4377.99	0.83	15.79	4256.13	0.84
	Cost 'C'		497287.4	100		492651.7	100		524853.8	100		504930.9	100
	Output (Qtls.) and income Rs.	250.09	1126798		258.95	1138017		276.37	1323489		261.8	1196101	
	Per quintal cost		1966.25			1902.52			1899.07			1921.76	

The cost of cultivation of guava was estimated using standard cost concepts, including Cost 'A', Cost 'B' and Cost 'C'. At the overall level, the per hectare cost of cultivation of guava was ₹504,930.94. The Cost 'A' component stood at ₹258,347.40 which accounted for 51.16 per cent of Cost 'C'. Among the various inputs under Cost 'A', the highest expenditure was incurred on foam mesh netting was ₹89,531.21 and contributing 17.73 per cent to the total cost. The second major cost was that of hired human labour was ₹81,271.08 per hectare, forming 16.10 per cent of Cost 'C'. Other significant expenditures included manures at ₹16,082.25 (3.19%), fertilizers at ₹38,283.65 (7.59%) and irrigation charges at ₹11,498.30 (2.28%). Under Cost 'B', the rental value of land emerged as the dominant component with an estimated cost of ₹199,199.93, accounting for 39.45 per cent of Cost 'C'. Additionally, the amortization cost of fixed capital was ₹11,297.23 was 2.24 per cent to the overall cost.

For Group I, the cost of cultivation per hectare was estimated at ₹497,287.35. The Cost 'A' for this group was ₹262,209.36 which formed 52.73 per cent of Cost 'C'. Foam mesh netting was again the leading input cost, with an expenditure of ₹89,250.32 (17.85%) followed by hired human labour at ₹82,172.32 (15.81%). Within Cost 'B', the rental value of land accounted for 37.73 per cent and amortization cost for 2.22 per cent of Cost 'C'. In the case of Group II, the total cost of cultivation was ₹492,651.70 per hectare. Cost 'A' stood at ₹254,496.83 contributing 51.66 per cent to Cost 'C'. Foam mesh netting charges remained the highest at ₹88,657.95 accounting for 18.00 per cent. Hired human labour formed 14.92 per cent of the total cost, while expenditure on fertilizers accounted for 6.99 per cent. The rental value of land and amortization cost contributed 38.47 per cent and 2.32 per cent respectively, to Cost 'C'. For Group III, the cost of cultivation per hectare was the highest, at ₹524,853.77. Cost 'A' was ₹258,336.02, which constituted 49.22 per cent of Cost 'C'. Foam mesh netting once again was the major cost item at ₹89,531.21 (17.73%) while expenditure on manures was ₹16,082.25 (3.19%). Under Cost 'B', the rental value of land and amortization cost contributed 42.00 per cent and 2.18 per cent to Cost 'C', respectively

Costs, Returns, Gross Income and B:C Ratio From Guava cultivation

The average gross return per hectare from guava cultivation was ₹11,96,101.23. Among the different farm size groups, Group I earned ₹11,26,797.95, Group II earned ₹11,38,016.75 while Group III recorded the highest gross returns of ₹13,23,489.01 per hectare.

At the overall level, the per hectare cost of cultivation was estimated under three components: Cost 'A', Cost 'B' and Cost 'C'. Cost 'A', which includes actual paid out expenses stood at ₹2,58,347.40. Cost 'B', which adds interest on fixed capital and the rental value of land to Cost 'A', was ₹4,94,333.51. Cost 'C', which further includes the imputed value of family labour amounted to ₹5,04,930.94 per hectare. Based on these estimates, the net returns per hectare were ₹9,37,753.83 over Cost 'A', ₹7,01,767.72 over Cost 'B' and ₹6,91,170.29 over Cost 'C'. The corresponding Benefit-Cost (B:C) ratios were 4.63, 2.42 and 2.37 respectively, indicating strong profitability at each cost level.

When examining individual farm size groups, it was observed that Group I incurred a Cost 'C' of ₹4,97,287.35 and realized a net return of ₹6,29,510.59 resulting in a B:C ratio of 2.27. Group II reported a cost of ₹4,92,651.70, earning a profit of ₹6,45,365.04 with a B:C ratio of 2.31. Group III, which had the highest Cost 'C' at ₹5,24,853.77 also achieved the highest profit of ₹7,98,635.24 per hectare and a B:C ratio of 2.52. These findings clearly demonstrate that guava cultivation is economically viable and provides considerable returns across all farm sizes.

Table 2: Costs and Returns from Guava Cultivation (₹/ha)

		Size groups				
Sr.no.	**Particulars**	**Unit**	**Group I**	**Group II**	**Group III**	**Overall**
1	**Total cost**					
	i) Cost 'A'	Rs.	262209.36	254496.83	258336.02	258347.40
	ii) Cost 'B'	Rs.	485900.37	481383.76	515716.41	494333.51
	iii) Cost 'C'	Rs.	497287.35	492651.70	524853.77	504930.94
2	**Profit at**					
	i) Cost 'A'	Rs.	864588.59	883519.92	1065152.99	937753.83
	ii) Cost 'B'	Rs.	640897.58	656632.99	807772.60	701767.72
	iii) Cost 'C'	Rs.	629510.59	645365.04	798635.24	691170.29
3	Production	Qtls	250.09	258.95	276.37	261.80
4	Gross income	Rs.	1126797.95	1138016.75	1323489.01	1196101.23
5	**B:C ratio**					
	i) Cost 'A'		4.30	4.47	5.12	4.63
	ii) Cost 'B'		2.32	2.36	2.57	2.42
	iii) Cost 'C'		2.27	2.31	2.52	2.37

At the overall level, the benefit-cost ratio at Cost 'C' was recorded at 2.37, clearly reflecting that Guava cultivation is a financially rewarding and economically viable fruit crop.

Conclusions

The total per hectare cost of production (Cost 'C') for Guava was calculated to be ₹504930.9, with Cost 'A' and Cost 'B' contributing (51.16%) and (921%), respectively. A major component of Cost 'A' was the cost of hired human labour. The Benefit-Cost (B:C) ratio of more than unity clearly demonstrated that Guava cultivation is economically viable and profitable for farmers in the Satara district.

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