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### Economic Analysis of Aonla Candy In Vidarbha Region

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#### Abstract

This study presents a detailed economic analysis of Aonla (Indian gooseberry) candy processing units in the Vidarbha region of Maharashtra. With increasing demand for healthy, shelf-stable, and value-added fruit products, Aonla candy has gained popularity due to its nutritional value, long shelf life, and market appeal. The study evaluates the financial feasibility of these units by examining capital investment, cost structures, marketing practices, value addition, and break-even analysis. Primary data were collected from small, medium, and large-scale Aonla candy processing units during the year 2020-2021. The analysis revealed a total average cost of ₹183 per kg, with gross returns amounting to ₹289 per kg, resulting in a benefit-cost ratio of 1.58. These findings confirm that Aonla candy processing is a viable and profitable agri-business, offering potential for income generation, employment, and rural industrial development.

**Keywords:** Aonla candy, value addition, agri-business, cost analysis, benefit-cost ratio, break-even analysis, rural development

#### Introduction

Aonla (*Phyllanthus emblica*), a fruit renowned for its high vitamin C content and therapeutic properties, is extensively cultivated and consumed in India. With growing consumer awareness toward health-oriented and functional foods, the demand for value-added products such as Aonla candy has increased substantially. This product offers a combination of nutritional benefits, extended shelf life, and consumer appeal through attractive taste and packaging. Given the fruit's seasonal nature and perishability, processing becomes essential to reduce post-harvest losses and enhance marketability. Aonla candy, as a processed product, plays a vital role in preserving the fruit while contributing to income generation through value addition.

This study focuses on the Vidarbha region of Maharashtra, where processing of horticultural crops has become an emerging livelihood opportunity. Primary data were collected from selected small, medium, and large Aonla candy processing units for the reference year 2020-2021. The dataset includes comprehensive information on capital investment, input costs, labour use, packaging, marketing practices, returns, and sales strategies. To assess economic viability and operational sustainability, the study employed cost-return analysis, break-even point calculations, and tools for evaluating marketing efficiency.

#### Objectives

To estimate per unit cost and returns of Aonla candy

processing units.

#### Methodology

This study, "Economic Analysis of Aonla Candy in Vidarbha", adopted a structured approach to analyse cost structures, economic returns, and marketing efficiency associated with orange-based value-added products.

The study was carried out in the Vidarbha region of Maharashtra, encompassing processing units of varying sizes. Units were classified based on their annual turnover:

- Small-scale units: Turnover less than Rs. 20 lakhs
- Medium-scale units: Turnover between Rs. 20-40 lakhs
- Large-scale units: Turnover above Rs. 40 lakhs

Four processing units were selected, and primary data were collected through personal interviews using a structured schedule. Analytical methods included cost-return analysis, break-even analysis, and computation of benefit-cost ratios. The break-even quantity was computed using the formula:

$$Q = \frac{TFC}{(P-AVC)}$$

Where,

Q = Quantity of processed product in quintals required for break-even.

TFC = Total fixed cost

P = Price (Processing charges) per quintal

AVC= Average variable cost of processing per quintal

### Results and Discussion

The economic analysis of Aonla candy processing units in the Vidarbha region was carried out by categorizing units into small, medium, and large groups based on their annual turnover. The major findings related to capital investment, raw material usage, production returns, cost structure, and profitability.

### Capital Investment in Aonla Candy Production

Capital investment is a critical factor influencing the scale and efficiency of processing units. As shown in Table 1, the overall capital investment for Aonla candy units was ₹2,88,782. Among all components, machinery constituted the highest share (42.75%), followed by building (33.14%) and land (8.88%). The data clearly indicate that capital investment increases with the scale of the unit, with large units investing significantly more in machinery and infrastructure.

**Table 1:** Capital Investment in Aonla Candy Production (Rs.)

Sr. No.	Particulars	Groups of Units			
		Small	Medium	Large	Overall
1	Land	4637 (4.29)	28202 (10.40)	38456 (7.39)	25642 (8.88)
2	Building	35346 (32.73)	91235 (33.64)	160548 (30.86)	95710 (33.14)
3	Machinery	45222 (41.88)	110586 (40.78)	214562 (41.24)	123457 (42.75)
4	Vehicle	16281 (15.08)	32477 (11.98)	80415 (15.45)	28452 (9.85)
5	Furniture	648 (0.60)	845 (0.31)	14852 (2.85)	5648 (1.96)
6	Other fixed capital	5846 (5.41)	7854 (2.90)	11485 (2.21)	9874 (3.42)
	Total	107980 (100)	271198 (100)	520318 (100)	288782 (100)

(Figures in parentheses indicate percentages to total)

At the overall level, capital investment per unit was Rs. 2.89 lakh. Machinery accounted for the highest share (42.75%), followed by building (33.14%) and land (8.88%). Capital investment increased with the scale of production.

### Unit Raw Material Used for Aonla Candy Processing

Raw materials form the backbone of aonla candy

production. Table 2 illustrates that the total raw material cost at the overall level was ₹2,35,698, where sugar contributed the highest share (51.21%), followed by aonla fruits (37.56%). The quantity of aonla fruits used increased from 1768.43 kg in small units to 7456.71 kg in large units, showing a direct correlation between production scale and raw material requirement.

**Table 2:** Per Unit Raw Material Used for Aonla Candy Processing

Sl. No.	Particulars	Groups of Units							
		Small		Medium		Large		Overall	
		Qty	Value	Qty	Value	Qty	Value	Qty	Value
1	Aonla fruits (kg)	1768.43	38905 (38.14)	3148.04	66109 (37.82)	7456.71	149134 (36.93)	4215.39	88523 (37.56)
2	Sugar(Kg)	1485.48	51992 (50.97)	2612.87	88942 (50.88)	6114.50	207893 (51.48)	3498.77	120708 (51.21)
3	Salt(kg)	74.27	1114 (1.09)	132.22	1983 (1.13)	313.18	4698 (1.16)	177.05	2656 (1.13)
4	Cardamom powder(kg)	0.27	1129 (1.11)	0.47	2010 (1.15)	1.12	4762 (1.18)	0.63	2692 (1.14)
5	Ginger powder(kg)	1.77	1326 (1.30)	3.15	2361 (1.35)	7.46	5593 (1.38)	4.22	3162 (1.34)
6	Preservatives(kg)	10.61	7533 (7.39)	18.89	13411 (7.67)	44.74	31766 (7.87)	25.29	17958 (7.62)
	Total		102000 (100.00)		174816 (100.00)		403845 (100.00)		235698 (100.00)

(Figures in parenthesis indicate percentages to gross returns)

Total candy production was 2655.70 kg with gross returns of Rs. 7.67 lakh. The 100g pack was the most profitable, contributing 54.20% of total income, showing consumer preference for smaller packaging

### Per Unit Production and Returns from Aonla Candy

The success of aonla candy processing is determined by the volume of production and corresponding revenue. Table 3 reveals that total production per unit was 2655.70 kg, with

gross returns of ₹7,67,257. Notably, 100g polythene bags contributed the most to income (₹4,15,882 or 54.20%),

indicating strong consumer preference for smaller packaging formats.

**Table 3: Per Unit Production and Returns from Aonla Candy**

Sr. No.	Particulars	Unit	Groups of Units							
			Small		Medium		Large		Overall	
			Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
1	Candy production	kg	1096.42		2014.74		5070.56		2655.70	
2	Polythene bag 100 gm	kg	570.14	165341 (52.310)	1027.52	297980 (51.25)	2433.87	705822 (48.16)	1434.08	415882 (54.20)
3	Polythene bag 250 gm	kg	383.75	110136 (34.84)	564.13	162469 (27.94)	1571.87	454272 (30.99)	770.15	221804 (28.91)
4	Polythene bag 500 gm	kg	142.54	40622 (12.85)	423.10	121005 (20.81)	1064.82	305603 (20.85)	451.47	129571 (16.89)
5	Gross returns	Rs.		316099 (100.00)		581455 (100.00)		1465697 (100.00)		767257 (100.00)

Total candy production was 2655.70 kg with gross returns of Rs. 7.67 lakh. The 100g pack was the most profitable, contributing 54.20% of total income, showing consumer preference for smaller packaging.

### Cost and Returns in Aonla Candy Production

An analysis of cost structure and profitability provides

clarity on the economic feasibility of processing units. As presented in Table 4, the total cost at the overall level was ₹4,87,087, with variable costs accounting for the majority (56.40%). The net returns amounted to ₹2,80,170, and the Benefit-Cost (B:C) ratio was 1.58, suggesting that aonla candy processing is a financially viable activity, especially at larger scales.

**Table 4: Cost and Returns in Aonla Candy Production (Rs.)**

Sr. No.	Particulars	Groups of Units			
		Small	Medium	Large	Overall
<b>A)</b>	<b>Variable cost</b>				
1	Aonla fruits	38905 (18.36)	66109 (17.63)	149134 (16.97)	88523 (18.17)
2	Sugar	51992 (24.54)	88942 (23.72)	207893 (23.66)	120708 (24.78)
3	Salt	1114 (0.53)	1983 (0.53)	4698 (0.53)	2656 (0.55)
4	Cardamom powder	1129 (0.53)	2010 (0.54)	4762 (0.54)	2692 (0.55)
5	Ginger powder	1326 (0.63)	2361 (0.63)	5593 (0.64)	3162 (0.65)
6	Fuel	992 (0.47)	1190 (0.32)	2380 (0.27)	1520 (0.31)
7	Preservatives etc.	7533 (3.56)	13411 (3.58)	31766 (3.61)	17958 (3.69)
8	Packaging material	2467 (1.16)	4332 (1.16)	10192 (1.16)	5338 (1.10)
9	Repairs and renewals	411 (0.19)	845 (0.23)	1145 (0.13)	645 (0.13)
10	Wages paid to casual labours	4637 (2.19)	11280 (3.01)	24139 (2.75)	11054 (2.27)
11	Interest on working capital @ 12%	13261 (6.26)	23095 (6.16)	53004 (6.03)	30511 (6.26)
	Total (A)	123767 (58.42)	208014 (55.47)	477273 (54.31)	274736 (56.40)
<b>B)</b>	<b>Fixed Cost</b>				
12	License fee	220 (0.10)	220 (0.06)	310 (0.04)	250 (0.05)
13	Salary to permanent labours	9621 (4.54)	10779 (2.87)	22585 (2.57)	12084 (2.48)
14	Land rent	2086 (0.98)	8460 (2.26)	11537 (1.31)	7693 (1.58)
15	Depreciation	5105 (2.41)	12585 (3.36)	47815 (5.44)	21835 (4.48)
16	Interest on fixed capital @ 8%	8638 (4.08)	21696 (5.79)	41625 (4.74)	23103 (4.74)

	Total (B)	25671 (12.12)	53740 (14.33)	123872 (14.10)	64964 (13.34)
	<b>Marketing Cost</b>				
17	Transport and other Marketing cost	5513 (2.60)	8581 (2.29)	13747 (1.56)	9280 (1.91)
18	GST 12%	56898 (26.86)	104662 (27.91)	263825 (30.02)	138106 (28.35)
	Total (C)	62410 (29.46)	113242 (30.20)	277573 (31.59)	147386 (30.26)
	Total Cost	211848 (100.00)	374996 (100.00)	878718 (100.00)	487087 (100.00)
<b>D)</b>	<b>Returns (Rs.)</b>				
19	a) Aonla candy	316099 (100.00)	581455 (100.00)	1465697 (100.00)	767257 (100.00)
20	b) by product	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
21	Gross Returns	316099 (100.00)	581455 (100.00)	1465697 (100.00)	767257 (100.00)
22	Net returns	104251 (32.98)	206458 (35.51)	586979 (40.05)	280170 (36.52)
23	B:C ratio	1.49	1.55	1.67	1.58
24	Per quintal cost	19322	18613	17330	18341
25	Cost per kg.	193.22	186.13	173.30	183.41
26	Returns per kg.	288.30	288.60	289.06	288.91

(Figures in parentheses indicate percentages to total cost)

Overall cost of production was Rs. 4.87 lakh per unit, with variable cost being the largest component (56.4%). Net returns stood at Rs. 2.80 lakh and profitability improved with larger unit size, as reflected in higher B:C ratios.

#### Per Quintal Cost and Returns in Aonla Candy Production

Per quintal analysis offers insights into the unit-level efficiency and profitability of processing. The table below presents the per quintal cost and returns in aonla candy production, segregated by unit size, to understand the economies of scale.

**Table 5:** Per Quintal Cost and Returns in Aonla Candy Production (Rs.)

Sr. No.	Particulars	Groups of Unit			
		Small	Medium	Large	Overall
1	Variable cost	11288	10325	9413	10345
2	Aonla fruits	3548	3281	2941	3333
3	Fixed Cost	2341	2667	2443	2446
4	Transport cost	503	426	271	349
6	Total Marketing Cost	5692	5621	5474	5550
7	Total Cost	19322	18613	17330	18341
8	<b>Returns (Rs.)</b>				
9	a)Aonla candy	28830	28860	28906	28891
10	b) by product	0	0	0	0
11	Gross Returns (Rs)	28830	28860	28906	28891
12	Net returns	9508	10247	11576	10550
13	B.C.Ratio	1.49	1.55	1.67	1.58
15	Polythene bag (100 gm)	19	19	17	18
16	Polythene bag (250 gm)	48	47	43	46
17	Polythene bag (500 gm)	97	93	87	92
18	Cost per kg	193	186	173	183
19	Gross returns per kg.	288	289	289	289

#### Interpretation

Per quintal production cost was Rs. 18,341 and gross returns were Rs. 28,891, yielding net returns of Rs. 10,550. Profitability increased with scale, with the B:C ratio highest (1.67) in large units.

#### Discussion

Aonla candy production is economically viable, with profitability improving significantly as the scale increases. Capital investment rose from ₹1.08 lakh in small units to ₹5.20 lakh in large units, with machinery being the largest component. Raw material costs were dominated by sugar and Aonla fruits, together making up nearly 89% of inputs across all unit sizes.

Average production was 2,655.70 kg per unit, yielding ₹7.67 lakh in gross returns. The 100g packs were the most profitable, contributing over 54% of income. Variable costs formed the majority of total expenses (over 54%), and net returns were highest in large units (₹5.87 lakh) with a B:C ratio of 1.67.

Per quintal costs declined with scale, while gross returns remained stable, confirming better efficiency in large-scale operations. The findings highlight that scaling up, controlling costs, and using effective packaging strategies are key to maximizing profitability.

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