

# Cost and Returns on Amla Production in Tiruppur District of Tamil Nadu – An Economic Analysis

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**Abstract:** Amla (*Embilica Officinalis*) is a deciduous plant with high Vitamin C belongs to the family of Euphorbiaceae and is native to India. In India, the cultivation of Amla is mainly done in Uttar Pradesh, Madhya Pradesh, Tamil Nadu, Gujarat, Chhattisgarh, Andhra Pradesh, etc. Uttar Pradesh is the lead state with a production of 379.14 tonnes followed by Madhya Pradesh occupies the second position with a production of 187.07 tonnes. Tamil Nadu occupies the Third position with a production of 171.47 tonnes (National Horticultural Board 2020). Tamil Nadu had a major production with an area of about 8, 40,000 hectares during the year 2020. The fruits are transferred to major markets such as Koyembedu market, Chennai, Ottanchathiram etc. Banarasi, NA-4(Krishna), NA-5 (Kanchan), NA-6, NA-7, NA-10, Francis, Chakaiya, Laxmi-52 are the major varieties that found in Tamil Nadu. Tamil Nadu agricultural University, Coimbatore, have released an Amla (grafted) variety named BSR-1. The specific objectives were to analyze the Cost and Returns on Amla Production in Tiruppur District of Tamil Nadu. The analysis of net return indicated the Amla earned a per hectare profit Rs. 1,495,730 and also BCR is 3.42. The production of Amla is profitable in the study region.

**Keywords:** Amla, Cost of cultivation, Cost of production, Production, Yield and Returns.

## 1. Introduction

Amla (*Embilica Officinalis*) is a deciduous plant with high vitamin C belongs to the family of Euphorbiaceae and is native to India. In different parts of India, it is known by different vernacular names such as amla or aonla in Hindi, Dharti, Dhatriphala, or Amalaki in Sanskrit, Amla or Amalaki in Bengal and Oriya, Nelli in Malayalam, Indian Gooseberry in English. Tamilnadu had a major production with an area of about 8, 40,000 hectares during the year 2020.

The Shivalik foot hills of North-West India provide ideal conditions for the cultivation of Amla with an average rainfall of 1100 mm per annum as this region is still rainfed. Presently Amla fruit has great significance in medicinal and cosmetic products and little attention has been paid towards processing into quality products as food items. All parts of Amla tree are of great economic importance. Amla is a very rich source of ascorbic acid. Dried Amla fruit is used in Ayurvedic and Unani systems of medicine for various ailments like fever, liver disorder, indigestion, anaemia, heart complaints and urinary

problems. Amla is considered as “Wonder Fruit for Health”.

Amla is cultivated in many parts of the world. Indonesia was the top producer of Amla with a production of 18.30 MT in 2020. Next are Philippines which produce 15.35 MT in 2020. India is the world’s third largest Amla producer with a production of 11.93 MT in 2020. In India, the cultivation of amla is mainly done in Uttar Pradesh, Madhya Pradesh, Tamil Nadu, Gujarat, Chhattisgarh, Andhra Pradesh, etc. Uttar Pradesh is the lead state with a production of 379.14 thousand tonnes followed by Madhya Pradesh occupies the second position with a production of 187.07 thousand tonnes. In India Amla is consumed as juice, jam, sauce, candy, chutney, pills, pickle, shreds and supari. Average market price is Rs. 13 to 15 per kg. India’s present production is around 1.5 tonnes a day. The total area under amla production is about 50,000 hectares with an annual production of 2 lakh tonnes or fruit.

Tamil Nadu occupies the third position in terms of area and production with 8,40,000 hectare under cultivation producing of 171.47 thousand tones (National Horticultural Board 2020). The fruits are transferred to major markets such as Koyembedu market, Chennai, Ottanchathiram etc.

Banarasi, NA-4(Krishna), NA-5 (Kanchan), NA-6, NA-7, NA-10, Francis, Chakaiya, Laxmi-52 are the major varieties that found in Tamil Nadu. Tamil Nadu agricultural University, Coimbatore, have released an Amla (grafted) variety named BSR-1.

India exports Amla and its products to countries like United States, Australia, Oman, United Kingdom, South Africa, Taiwan etc., These products are exported through different air ports like Bangalore, Delhi air cargo, Tughlakabad, Patparganj, Nhava Sheva sea port etc., In Bombay Air Cargo port exports Indian Fresh Amla to Singapore and United Kingdom. From Chennai port Amla Capsules and Amla Shampoo are exported to Germany and Malaysia.

## 2. Objectives of the Study

- 1) To estimate the Cost and Returns on Amla Production in Tiruppur District of Tamil Nadu.

### 3. Methodology

#### A. Selection of Study Area

In the selection of study area, multistage purposive sampling method was followed. Tiruppur district was purposively selected at the first stage because of high area of Amla followed by Tirunelveli district. In the second stage among the 13 blocks in Tiruppur district, Vellakoil and Udumalaipet blocks were purposively selected because of high area of Amla cultivation. In the third stage further in the selected block the villages namely Mettupalayam, Udaiyam, were purposively selected, since area wise these villages occupy the first two places in Amla cultivation in Vellakoil block. Elayamuthur, Sellappampalayam, are another two villages which occupies first and second place in Udumalaipet block. From each of the selected villages 30 farmers were selected at random. Totally 120 sample respondents were stratified random sampling technique.

#### B. Tools of Analysis

##### 1) Cost of Cultivation

The Directorate of Economics and Statistics, Government of India estimated different costs such as Cost A<sub>1</sub>, Cost A<sub>2</sub>, Cost B<sub>1</sub>, Cost B<sub>2</sub>, Cost C<sub>1</sub>, Cost C<sub>2</sub> and Cost C<sub>3</sub>.

Cost A<sub>1</sub>: It consist of all actual expenses in cash and kind incurred in production by the owner operator. It includes cost of human labour, cost of manures and fertilizers, cost of plant protection chemicals, irrigation cost, interest on working capital, land revenue and depreciation of fixed capital.

Cost A<sub>2</sub>: Cost A<sub>1</sub> plus rent paid for leased in land

Cost B<sub>1</sub>: Cost A<sub>2</sub> plus interest on owned fixed capital assets

Cost B<sub>2</sub>: Cost B<sub>1</sub> plus rental value of owned land

Cost C<sub>1</sub>: Cost B<sub>1</sub> plus imputed value of family labour

Cost C<sub>2</sub>: Cost B<sub>2</sub> plus imputed value of family labour

Cost C<sub>3</sub>: Cost C<sub>2</sub> plus cost of management. The cost of management on the other hand was reckoned as 10 percent of Cost C<sub>2</sub>.

Cost of production = (Cost C<sub>3</sub> minus value of By-product) / Quantity of main product produced

Gross Return = (Quantity of Main Product price of main product (Rs)) plus (Quantity of byproduct price of by product (Rs))

Net income: Gross return minus Cost C<sub>3</sub>

##### 2) Cost of Production per Unit

Cost of production per tonne of Amla was arrived at by dividing the net cost of cultivation per acre by the total per acre yield of Amla in tonnes.

$$\text{Cost of production} = \frac{\text{Cost of cultivation} - \text{Value of by product}}{\text{Yield/acre}}$$

##### 3) Return per rupee invested

Cost benefit was obtained by dividing the gross income by the total cost of production per acre

$$\text{Cost benefit} = \frac{\text{Gross returns}}{\text{Cost of cultivation}}$$

### 4. Results and Discussion

#### A. Cost and Returns of Amla Orchards

##### 1) Establishment Cost of Amla Orchard

The establishment of Amla orchards needed four years. The establishment cost in Amla orchards are classified into investment cost and maintenance cost. The investment cost includes the cost on rental value of land, pump house, sprayer and plant material, investment in digging of pits and planting, and fencing. The maintenance cost includes cost on digging labour for various operations and material cost and fixed cost during gestation period. The investment costs were considered for beginning period of the establishment with maintenance cost was for four years period up to the bearing stage.

Table 1  
Establishment cost in Amla orchard (Rs/ha)

	Particulars	Value	Percent
<b>A.</b>	<b>Investment costs</b>		
1	Rental Value of Land	12000.00	8.60
2	Investment in digging of pits and planting	3925.00	2.80
3	Pump house	3500.00	2.50
4	Drip irrigation	8000.00	5.75
5	Sprayer	1250.00	0.90
6	Fencing	4000.00	2.88
	<b>Sub Total</b>	<b>32675.00</b>	<b>23.43</b>
<b>B.</b>	<b>Maintenance Cost</b>		
	I Year	23745.98	17.16
	II Year	25211.72	18.22
	III Year	27803.00	20.09
	IV Year	29194.46	21.10
	<b>Sub Total (I+II+III+IV)</b>	<b>105655.09</b>	<b>76.57</b>
	<b>Total establishment cost (A+B)</b>	<b>138330.09</b>	<b>100.00</b>

\*Split up is given in Table-2

It can be observed from the Table-1 that the share of the investment cost in the total establishment cost was Rs.32675.00 (23.43 per cent). The Rental value of land is Rs.12000.00 (8.60 per cent). The maintenance cost which are considered for the gestation period increasing from Rs.23745.98 to Rs.29194.46 the total maintenance cost up to bearing period accounted for Rs. 105655.09 (76.57 per cent) to the total establishment cost.

It was observed from Table-2 that the average percent per ha establishment cost incurred by Amla growers during gestation period was Rs. 105655.09, Out of this the labour, material and fixed costs accounted for about 17.62, 12.92 and 69.45 per cent respectively.

The major item of labour cost was on irrigation, watch and ward (Rs.7600) which formed 7.19 per cent of total maintenance cost followed by weeding (Rs.3522) had 3.00 per cent, fertilizer application (Rs. 3293) had 3.11 per cent, PPC application (Rs. 1093.41) had 1.03 per cent and others fencing, land preparation, gap filling and others are 0.61, 0.54, 0.05 and 1.04 per cent of the total establishment cost respectively. The material cost amounted to Rs.12676.09, out of which cost of FYM (4.16 per cent), cost of fertilizer (5.57 per cent), and cost of PPC (0.85 per cent) and others contributed about 1.4 per cent. The fixed cost accounted for Rs. 73408.0, of which major item was imputed rental value of land paid to land (47.08 per cent) followed by depreciation (15.74 per cent) interest on fixed capital 6.02 per cent, respectively.

Table 2  
Maintenance cost of Amla orchard during gestation period (Rs/ha)

S.No.	Particulars	I year	II year	III year	IV year	Total	Per cent
<b>I.</b>	<b>VARIABLE COST</b>						
<b>A</b>	<b>Labour cost</b>						
1	Land preparation	575.15	-	-	-	575.15	0.54
2	Gap filling	55.67	-	-	-	55.67	0.05
3	FYM application	344.75	394.83	447.50	497.75	1684.83	1.59
4	Fertilizer Application	444.00	894.42	952.92	1002.42	3293.76	3.11
5	Weeding	784.67	843.67	922.42	971.42	3522.18	3.33
6	Fencing					645.20	0.61
7	PPC application	196.58	249.50	306.75	340.58	1093.41	1.03
8	Irrigation, watch and ward	1800.00	1800.00	2000.00	2000.00	7600.00	7.19
9	Miscellaneous	250.00	250.00	300.00	300.00	1100.00	1.04
	<b>Sub total</b>	<b>4450.82</b>	<b>4432.42</b>	<b>5207.32</b>	<b>5479.64</b>	<b>19570.10</b>	<b>17.62</b>
<b>B</b>	<b>Material cost</b>						
1	FYM	881.37	929.90	1237.33	1348.55	4397.15	4.16
2	Fertilizer	814.95	1505.62	1707.85	1857.68	5886.10	5.57
3	PPC	189.80	215.37	236.82	260.10	902.09	0.85
4	Seedlings for gap filling	103.20	126.97	133.6	133.92	497.69	0.47
	<b>Sub Total</b>	<b>1989.32</b>	<b>2777.86</b>	<b>3315.60</b>	<b>3600.25</b>	<b>11683.03</b>	<b>11.99</b>
	Interest on working capital @ 8.5%	169.09	236.19	281.83	306.02	993.06	0.93
	Total material cost (B)	2158.41	3014.05	3597.43	3906.27	12676.09	11.99
	<b>Total material cost (A+B)</b>	<b>6609.23</b>	<b>7746.47</b>	<b>8804.75</b>	<b>9385.91</b>	<b>32246.29</b>	<b>12.92</b>
<b>II</b>	<b>FIXED COST</b>						
1	Rent value	12000	12000	12750	13000	49750	47.08
2	Land revenue	150	150	150	150	650	0.61
3	Depreciation	3500	3500	4450	4800	16340	15.74
4	Interest on working capital @9.5%	1486.75	1815.25	1648.25	1718.55	6368.80	6.02
	<b>Total fixed cost II</b>	<b>17136.75</b>	<b>17465.25</b>	<b>18998.25</b>	<b>19808.55</b>	<b>73408.8</b>	<b>69.45</b>
	<b>Total cost (I+II)</b>	<b>23745.98</b>	<b>25211.72</b>	<b>27803.00</b>	<b>29194.46</b>	<b>105655.09</b>	<b>100.00</b>

\*Split up is given in Table 3

Table 3

Maintenance cost of Amla orchard in bearing period (IV year onwards)

S. No.	Particulars	Value	Per cent
<b>A</b>	<b>Variable cost</b>		
<b>A<sub>1</sub></b>	<b>Labour cost</b>		
1	FYM Application	622.77	1.04
2	Fertilizer Application	1165.43	1.96
3	PPC application	484.07	0.81
4	Weeding	1260.47	2.12
5	Irrigation, watch and ward	2000.00	3.37
6	Harvest	32952.33	55.52
7	Others	350.00	0.58
	<b>Total labour cost</b>	<b>38835.07</b>	<b>65.44</b>
<b>A<sub>2</sub></b>	<b>Material cost</b>		
1	FYM	1599.40	2.69
2	Fertilizer	2144.00	3.61
3	PPC	300.00	0.50
	Sub total	4043.60	6.81
4	Working capital @ 8.5%	343.71	0.57
	<b>Total Material</b>	<b>8430.71</b>	<b>14.20</b>
	<b>Total variable cost (A<sub>1</sub>+A<sub>2</sub>)</b>	<b>43222.38</b>	<b>72.83</b>
<b>B</b>	<b>Fixed cost</b>		
1	Rental value of land	12000.00	20.22
2	Land Revenue	40.00	0.07
3	Depreciation	400.00	0.67
	Sub Total	12440.00	20.96
4	Interest on fixed capital@9.5%	1181.80	1.99
	<b>Total fixed cost</b>	<b>13621.80</b>	<b>22.95</b>
5	Imputed value of Family labour	2500.00	4.21
<b>C</b>	<b>Total Cost C</b>	<b>59344.18</b>	<b>100.00</b>
	Yield (kg/ha)	8750.00	
	Output Price (Rs/kg)	30.00	
	Gross return	203155.82	
	Net return	143811.64	
	BCR	3.42	

#### Maintenance cost during gestation period of Amla orchard:

It was observed from Table 2 that the average percent per ha establishment cost incurred by Amla growers during gestation period was Rs. 105655.09, Out of this the labour, material and fixed costs accounted for about 17.62, 12.92 and 69.45 per cent respectively.

The major item of labour cost was on irrigation, watch and ward (Rs.7600) which formed 7.19 per cent of total maintenance cost followed by weeding (Rs.3522) had 3.00 per cent, fertilizer application (Rs. 3293) had 3.11 per cent, PPC application (Rs. 1093.41) had 1.03 per cent and others fencing, land preparation, gap filling and others are 0.61, 0.54, 0.05 and 1.04 per cent of the total establishment cost respectively. The material cost amounted to Rs.12676.09, out of which cost of FYM (4.16 per cent), cost of fertilizer (5.57 per cent), and cost of PPC (0.85 per cent) and others contributed about 1.4 per cent. The fixed cost accounted for Rs. 73408.0, of which major item was imputed rental value of land paid to land (47.08 per cent) followed by depreciation (15.74 per cent) interest on fixed capital 6.02 per cent, respectively.

#### Maintenance cost of Amla orchard during bearing period:

Maintenance costs were the recurring costs incurred after the establishment of the orchard i.e., from fourth year onwards for upkeep of the plants so that good yield can be obtained over the economic lifespan of plants. The maintenance cost included the expenditure towards the use of labour and the use of labour and other material inputs per year along with fixed cost for different age group of orchards.

It was observed from the Table 3 that the average use of labours per ha was amounted to Rs. 38835.07 which formed of 68.34 per cent to the total maintenance cost. Out of the items

major contribution of cost was made through harvesting (57.96) followed by irrigation, watch and ward, FYM application, weeding and application of PPC, which for 3.51, 1.09, 2.05, 2.21 and 0.85 per cent respectively.

The total cost C was Rs.56844.18 from fourth year onwards. Fixed cost constitutes cost of rental value of land 21.11 per cent, and depreciation 2.07 per cent to the total cost. All maintenance cost were found increasing from 4th year onwards except Irrigation.

2) Yield and Return structure of Amla

It could be seen from Table 4 that the total average yield of Amla from 5<sup>th</sup> year to 15<sup>th</sup> year obtained by the sample farmers was found to be 75.47 tons per ha and returns was about Rs.1, 495,730.

Table 4  
Yield and return structure of Amla in the study area

S. No	Period	Yield (T/ha)	Total value (Rs.)
1	5 <sup>th</sup> Year	3.62	36200
2	6 <sup>th</sup> Year	4.37	52440
3	7 <sup>th</sup> Year	5.00	75000
4	8 <sup>th</sup> Year	5.62	95540
5	9 <sup>th</sup> Year	6.25	106250
6	10 <sup>th</sup> Year	6.87	130530
7	11 <sup>th</sup> Year	7.50	157500
8	12 <sup>th</sup> Year	8.12	186760
9	13 <sup>th</sup> Year	8.75	190000
10	14 <sup>th</sup> Year	9.37	215510
11	15 <sup>th</sup> Year	10.00	250000
	<b>Total</b>	<b>75.47</b>	<b>1495730</b>

5. Conclusion

The investment cost in the total establishment cost was Rs.32675.00 (23.43 per cent). The maintenance cost which are considered for the gestation period increasing from Rs.23745.98 to Rs.29194.46 the total maintenance cost up to bearing period accounted for Rs. 105655.09 (76.57 per cent) to the total establishment cost. The total cost C was Rs.56844.18 from fourth year onwards. Fixed cost constitutes cost of rental value of land 21.11 per cent, and depreciation 2.07 per cent to the total cost. All maintenance cost were found increasing from 4th year onwards except Irrigation. The total average yield of Amla from 5<sup>th</sup> year to 15<sup>th</sup> year obtained by the sample farmers was found to be 75.47 tons per ha and the analysis of net return indicated the Amla earned a per hectare profit Rs. 1,495,730

and also BCR is 3.42. Hence, the production of Amla is profitable in the study region.

References

[1] Amirthalingam. 2015. "An Economic Analysis of Production and Marketing in Banana Tiruchirappalli District of Tamil Nadu", (*Unpublished M.Sc. (Ag) Thesis*, Department of Agricultural Economics, Faculty of Agriculture, Annamalai University).

[2] Chinnabonia. 2018. "An Economic Analysis of Production, Marketing and Export of FCV Tobacco in Prakasam District", (*Unpublished M.Sc., (Ag) thesis*, submitted to department of Agricultural Economics, Annamalai University).

[3] Kokila. 2017. "An Economic Analysis of Production and Marketing of Rose in Hosur Taluk of Krishnagiri District", *Unpublished M. Sc., (Ag.) Thesis* Submitted to the Agricultural Economics, Annamalai University.

[4] Mirdu Pavan Chitney. 2017. "Production and Marketing of Turmeric in Assam", *International Education and Research Journal*, 5(3): pp. 217-219.

[5] Narashiman. S., Raju. V.T., Shareet. S.M. and Bhyravamuruthy. S. 2004. "Cost and Returns analysis of Black gram cultivation in Yanam region of Union territory of Pondicherry", *The Andhra Agricultural Journal*, 51(3): 504-507.

[6] Radha. Y., Prasad. D.S. and Jayarama Reddy. S. 2006. Economic Analysis of Production and Marketing of Grape in Andhra Pradesh, *Indian Journal of Agriculture Research*, 40(1): 18-24.

[7] Raghul. 2018. "An Economic Analysis of Production and Marketing of Tapioca in Salem District", *Unpublished M. Sc., (Ag.) Thesis* Submitted to the Agricultural Economics, Annamalai University.

[8] Ramanan. G. 2012. Cost of Production and Capital Productivity of Grape Cultivation in Tamil Nadu, India, *Indian Streams Research Journal*, 2(1): 1-6.

[9] Ramkumar. R. 2001. "Costs and margin in coconut marketing: some Evidence from Kerala", *Indian Journal of Agricultural Economics*, 56(4): pp. 668-682.

[10] Satheesh. 2018. "An Economic Analysis of Production and Marketing of Aggrgatum Onion in Perambalur District of Tamil Nadu", *Unpublished M. Sc., (Ag.) Thesis* Submitted to the Agricultural Economics, Annamalai University.

[11] Sivarajmurugan. S. and Siva Subramanian. M. 2014. The Input-Output Ratio of Grapes Cultivation: Study with Special Reference to the Different Age of Vineyards in Theni District of Tamil Nadu. *International journal of Management and Social Science Research Review*, 1(4): 106-110.

[12] Sundaravaradarajan. K.R. and Ramanathan. G. 2003. "Cost, Returns and Economic Viability of Cashew Plantations in Tamil Nadu", *Agricultural Situation in India*, LIX (II): 709-715.

[13] Vasugi. 2016. "An Economic Analysis of Production and Marketing of Gingelly Villupuram District", (*Unpublished M.Sc., (Ag) thesis*, submitted to department of Agricultural Economics, Annamalai University).

[14] Vinoth Kumar. 2016. "An Economic Analysis of Production and Marketing of Kodo Millets in Kallakurichy from Villupuram District of Tamil Nadu", (*Unpublished M.Sc., (Ag) thesis*, submitted to department of Agricultural Economics, Annamalai University).