

# An Economic Analysis of Cost, Returns and Profitability in Production of Cashew Nut in South Goa District of Goa, India

## ABSTRACT

Cashew is known as 'Gold mine' of wasteland because it can give high yield under any climatic conditions and soil condition with little or no maintenance. Due to its high nutritive value cashew is gaining importance among the health-conscious people both in domestic market and international market. Implementation of new technology and optimum utilization of resources will help the farmers to reduce the cost of production and to increase net returns. Cashew nut cultivation plays vital role in Cherishing and sustaining the momentum of rural development in study area. The study was conducted in South Goa district of Goa during the year 2023 and is based on both primary and secondary data collected from 100 cashew nut growers with the help of pretested personal interview scheduled from 5 villages selected randomly and the data was analysed using analytical tools. The results revealed that total establishment cost of cashew of marginal category is Rs 175320.67, small category is Rs 172541.83, semi medium category Rs 171890.83 and medium category is Rs 170401.34. Total annual cost of cultivation (Rs/ha) from 5<sup>th</sup> year onwards of marginal category was Rs 99512.45, small category was Rs 97091.63, semi medium category was Rs 95443.67 and medium farmer was Rs 93202.29. It Clearly reveals that cost of cultivation (Rs/ha) increases with decrease in farm size. It clearly indicates that in all the size groups average maximum cost was spent on **hired** human labour around (30.41%) followed by rental value of owned land (20.77%) and miscellaneous cost (20.50%). It shows that net returns were more in medium category (Rs 77072.72) followed by semi medium (Rs 70761.33), small category (Rs 62048.37) and marginal category (Rs 55487.55). Input-output ratio was found to be 1:1.56 for marginal farmers, 1:1.64 for small farmers, 1:1.74 for semi medium farmers and 1:1.83 for medium farmers. It inferred that the cashew nut production is profitable enterprise for medium farmer than semi medium, small and marginal farmers

*Key words: Establishment cost, Cost of cultivation, Amortized establishment cost, Output-input ratio, Net returns, Gross returns.*

## INTRODUCTION

Cashew (*Anacardium occidentale*) evergreen tree of sumac family (Anacardiaceae) mainly cultivated for curved edible seeds known as cashewnut. It is one of the highly nutritious and expensive dry fruit. It is known for pleasant, delicious taste and balance nutritive content. It is rich in protein, fat, carbohydrates and all the fat-soluble vitamins A, D and K. It is also a good source of minerals like calcium, magnesium, phosphorous, potassium, sodium, iron and others. In fact, cashew is a perfect food with zero per cent cholesterol. 60% cashew kernels are used as snacks and remaining 40% are used in confectionery, sweet making and Savory. The cashew tree grows up to height of 12-14 mt, generally in all type of soil from sandy to laterite. Cashew is very well adapted to Indian coastal condition under hot and humid condition, temperature ranging between 20 to 30 °C, relative humidity range between 60 to 95 % and annual rainfall around 2000-3500 mm. Edaphic and Agro-climatic conditions of Goa offer good scope for cultivation of cashew.

The origin of cashew was Brazil, it was during sixteenth century Portuguese introduced the cashew first time in Goa, India as means of controlling coastal erosion. From there the cashew was spread within country with the aid of elephant that ate bright cashew fruit along with nuts but the nut was hard to digest and expelled through droppings. It was not until the nineteenth century that plantations were developed and the tree then spread to a number of other countries in Africa, Asia and Latin America (Harish, 2009). Subsequently.

India is one the largest cashewnut producing countries in the world. The country is the largest producer and processor of cashews in the world. In India total area under cashew is 0.7 million hectares and it annually produce 0.4 million metric tons of cashewnuts. India is the largest cashew exporter, with more than 15% of the world's export share. In the year 2021-22 India's export grew by 7% i.e., US \$ 452 million from US \$420 million in 2020-21. In March 2022, the country exported cashews worth US\$ 40 million, up from US\$ 33.58 million in February 2022 (Angamuthu 2022).

Cashewnut is one of the most important plantation crops in Goa State. Cashewnut often referred to as wonder nut and is one of the most valuable processed nuts traded on the global commodity markets and is also an important cash crop. It has the potential to provide source of livelihood for the cashew growers, empower rural women in the processing sector, creating employment opportunities and generating foreign exchange through exports. In the state of Goa, it occupies the largest area among horticultural crops. This crop covers about 55 302 ha area with an annual production estimated at 27 070 tonnes.

## MATERIALS AND METHODS

A multi-stage stratified sampling procedure was adopted for the present investigation to select the district, block and villages. In first stage the South Goa district of Goa State was selected Keeping in mind the highest area under Cashewnut. In second stage out of those 7 blocks in South Goa 2 blocks Quepem and Canacona were selected as these are the two main Cashew nut production area in South Goa district. In third stage out of those villages in the Quepem and Canacona block, 10% village from each block was selected randomly for primary data collection, Total villages in Quepem block are 40 and Canacona block are 9, so total 5 villages from both the block were selected i.e., Benurdem, Barcem, Adnem, Cotigao and Padi respectively. A list of all the farmers were prepared and 10 % of the Cashewnut growers of the village were selected randomly for the study. Thus, altogether, 100 farmers from 5 villages were selected, viz, marginal, small, semi-medium and medium respondents respectively. Total sample farmers were 100. Primary data from the farmers was collected through a well-prepared schedule designed for the study. The cost of different operations, along with the quantity and quality of produce, was recorded including fixed as well as variable costs of Cashewnut production. The relevant data on cropped area, cropping pattern, irrigated area, their resources inventory, etc. was recorded on the schedule designed for the study.

The technique like tabular analysis, arithmetic mean and percentage analysis are used to analyse different cost concept Cost-A, Cost-B and Cost-C, and returns.

## RESULT AND DISCUSSION

### Establishment cost of cashew nut cultivation

This includes Cost of establishment (planting of seedling) i.e., investment year (1<sup>st</sup>) and maintenance cost (2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> year) till it starts flowering. This cost then evenly distributed in annual cost of cultivation from 5<sup>th</sup> year onwards till its lifespan @ 10% interest rate (amortised establishment cost).

The establishment cost of cashew nut plantation in South Goa district is presented in Table 1 Under marginal category cost spent in the 1<sup>st</sup> year (Investment year) was Rs 52345 followed by Maintenance years i.e., 2<sup>nd</sup> year Rs 39949.67, 3<sup>rd</sup> year Rs 41227 and 4<sup>th</sup> year Rs 41227. Under small category cost spent in the 1<sup>st</sup> year (Investment year) was Rs 51815.5 followed by Maintenance years i.e., 2<sup>nd</sup> year Rs 39655.33, 3<sup>rd</sup> year Rs 40222 and 4<sup>th</sup> year Rs 40849. Under semi medium category cost spent in the 1<sup>st</sup> year (Investment year) was Rs 51742.5 followed by Maintenance years i.e., 2<sup>nd</sup> year Rs 39029, 3<sup>rd</sup> year Rs 40145.33 and 4<sup>th</sup> year Rs 40974. Under medium category cost spent in the 1<sup>st</sup> year (Investment year) was Rs 51719 followed by Maintenance years i.e., 2<sup>nd</sup> year Rs 38620.67, 3<sup>rd</sup> year Rs 39782.67 and 4<sup>th</sup> year Rs 40279. Total establishment cost of marginal category is Rs 175320.67, small category is Rs 172541.83, semi medium category Rs 171890.83 and medium category is Rs 170401.34. The overall average cost of establishment of all the category is presented in table 1, average cost spent in the 1st year (Investment year) was Rs 51905.5 followed by Maintenance years i.e., 2<sup>nd</sup> year Rs 39313.66, 3<sup>rd</sup> year Rs 40344.25 and 4<sup>th</sup> year Rs 40975.25 and total establishment cost was Rs. 172538.67. From above Table 1 it is inferred that cost of establishment (Rs/ha) increases with decrease in farm size. Similar findings were also observed by **Rede, G.D. and Bhattacharyya, K. (2018)**. This is because farmers with small holdings have tendency of setting up maximum plants per unit area to get higher yield and also larger farmer are getting the materials for cultivation in large bulk quantity which helps them to get the materials cheaper than small holding farmers.

**Table 1 Establishment cost of cashew cultivation (Rs/ha)**

Sl. No	Particulars	Cost (Rs)				
		Marginal	Small	Semi Medium	Medium	Sample Avg.
1	<b>Initial Investment (1st Year)</b>	52345	51815.5	51742.5	51719	51905.5
	<b>Maintenance cost</b>					
2	2nd Year	39949.67	39655.33	39029	38620.67	39313.67
3	3rd Year	41227	40222	40145.33	39782.67	40344.25
4	4thYear	41799	40849	40974	40279	40975.25
	<b>Total Establishment Cost</b>	<b>175320.67</b>	<b>172541.83</b>	<b>171890.83</b>	<b>170401.34</b>	<b>172538.67</b>

### Cost of cultivation

The annual cost of cultivation from 5<sup>th</sup> year onwards was calculated. It includes all the costs incurred for the production of the Cashew nut. The production cost is divided into fixed and variable cost. Fixed cost includes land revenue, rental value of land and depreciation whereas variable cost includes seed, nutrients, farmyard manure, plant protection chemicals, weeding, irrigation, labour cost for various operations.

### **Annual cost of cultivation of cashew (Rs/ha)**

The cost of cultivation of cashew nut plantation in South Goa was shown in Table 2. Under marginal category more cost was spent on **hired** human labour Rs.28490 (28.58%) followed by rental value of owned land Rs. 20000 (20.10%), Miscellaneous cost Rs 19978.75 (20.08%). Under small category more cost was spent on **hired** human labour Rs 29000 (29.87%) followed by rental value of owned land Rs 20000 (20.60%), Miscellaneous cost Rs 19803.11 (20.40%). Under semi medium category more cost was spent on **hired** human labour Rs 29510 (30.92%) followed by rental value of owned land Rs 20000 (20.95%), Miscellaneous cost Rs 19724.16 (20.67%). Under medium category more cost was spent on **hired** human labour Rs 30140 (32.34%) followed by rental value of owned land Rs 20000 (21.46%), Miscellaneous cost Rs 19453.50 (20.87%). Total cost of cultivation (Rs/ha) of marginal category was Rs 99512.45, small category was Rs 97091.63, semi medium category was Rs 95443.67 and medium farmer was Rs 93202.29. The overall average cost of cultivation per ha. was Rs. 96312.51 out of which labour cost was Rs. 29285 (30.41%), Application of FYM was Rs. 3317.50 (3.44%), Weeding (weed cutter machine) was Rs. 1652.65 (1.72%), miscellaneous charges were Rs. 19739.88 (20.50%), plant protection was Rs. 968 (1.01%), interest on working capital was Rs. 5496.30 (5.71%) and total of above all the following particulars was Cost A i.e., Rs. 60459.33 (62.77%). Then depreciation on capital asset was Rs. 2000 (2.08%), rental value of owned land was Rs. 20000 (20.77%), land revenue was Rs. 72.50 (0.08%), interest on fixed capital was Rs. 1200 (1.25%) and total of Cost A, Depreciation on capital asset, rental value of and, land revenue, interest on fixed capital was Cost B i.e., Rs. 83731.83 (86.94%). Then value family labour was Rs. 3825 (3.97%) and total of Cost B, family labour was Cost C i.e., Rs 87556.83 (90.91%). Then managerial cost was Rs. 8755.68 (9.09%) and total of Cost C, managerial cost was Total Cost of cultivation i.e., Rs. 96312.51 (100%). From Table 2 it can be clearly seen that medium farmer has comparative advantage over semi-medium, small and marginal farmers i.e., cost of cultivation decreases with increase in farm size. Similar findings were also observed by **Naik, J. Nehru (2019)**

**Table 2 Annual cost of cultivation of Cashew from fifth year onwards (Rs/ha)**

Sr.No.	Particulars	Marginal		Small		Semi medium		Medium		Sample avg.	
		Cost (Rs)	Per cent	Cost (Rs)	Per cent	Cost (Rs)	Per cent	Cost (Rs)	Per cent	Cost (Rs)	Per cent
1	Hired human labour	28490.00	28.63	29000.00	29.87	29510.00	30.92	30140.00	32.34	29285.00	30.41
2	Application of FYM	3750.00	3.77	3500.00	3.60	3220.00	3.37	2800.00	3.00	3317.50	3.44
3	Weeding (weed cutter machine)	1766.59	1.78	1720.00	1.77	1624.00	1.70	1500.00	1.61	1652.65	1.72
4	Miscellaneous (Repair, incidental charges and amortised establishment cost)	19978.75	20.08	19803.11	20.40	19724.16	20.67	19453.50	20.87	19739.88	20.50
5	Plant protection	1120.00	1.13	977.00	1.01	910.00	0.95	865.00	0.93	968.00	1.01
6	Interest on Working Capital @10%	5510.53	5.54	5500.01	5.66	5498.82	5.76	5475.85	5.88	5496.30	5.71
7	<b>Cost A <math>\Sigma</math> (1-7)</b>	<b>60615.87</b>	<b>60.91</b>	<b>60500.12</b>	<b>62.31</b>	<b>60486.98</b>	<b>63.37</b>	<b>60234.35</b>	<b>64.63</b>	<b>60459.33</b>	<b>62.77</b>
8	Depreciation of Capital Assets	2000.00	2.01	2000.00	2.06	2000.00	2.10	2000.00	2.15	2000.00	2.08
9	Rent value of owned land	20000.00	20.10	20000.00	20.60	20000.00	20.95	20000.00	21.46	20000.00	20.77
10	Land Revenue	50.00	0.05	65.00	0.07	80.00	0.08	95.00	0.10	72.50	0.08
11	Interest on fixed capital @ 10 %	1200.00	1.21	1200.00	1.24	1200.00	1.26	1200.00	1.29	1200.00	1.25
12	<b>Cost B <math>\Sigma</math> (8-11)</b>	<b>83865.87</b>	<b>84.28</b>	<b>83765.12</b>	<b>86.27</b>	<b>83766.98</b>	<b>87.77</b>	<b>83529.35</b>	<b>89.62</b>	<b>83731.83</b>	<b>86.94</b>
13	Family human labour	6600.00	6.63	4500.00	4.63	3000.00	3.14	1200.00	1.29	3825.00	3.97
14	<b>Cost C <math>\Sigma</math> (12-13)</b>	<b>90465.87</b>	<b>90.91</b>	<b>88265.12</b>	<b>90.91</b>	<b>86766.98</b>	<b>90.91</b>	<b>84729.35</b>	<b>90.91</b>	<b>87556.83</b>	<b>90.91</b>
15	Managerial cost @10% of cost C	9046.59	9.09	8826.51	9.09	8676.70	9.09	8472.94	9.09	8755.68	9.09
16	<b>Total cost <math>\Sigma</math> (14-15)</b>	<b>99512.45</b>	<b>100.00</b>	<b>97091.63</b>	<b>100.00</b>	<b>95443.67</b>	<b>100.00</b>	<b>93202.29</b>	<b>100.00</b>	<b>96312.51</b>	<b>100.00</b>

## Cost and return of cashew nuts

The yield obtained, returns and input-output ratio was presented in Table 3. Under marginal category total yield of cashewnut (main produce) was 850 kg and cashew fruit (by produce) were 12000 kg, returns on main produce was Rs 119000 and by produce was Rs 36000, total gross return was Rs 155000 and net returns was Rs 55487.55, input-output ratio was 1:1.56. Under small category total yield of cashewnut (main produce) was 871 kg and cashew fruit (by produce) were 12400 kg, returns on main produce was Rs 121940 and by produce was Rs 37200, total gross return was Rs 159140 and net returns was Rs 62048.37, input-output ratio was 1:1.64. Under semi medium category total yield of cashewnut (main produce) was 898 kg and cashew fruit (by produce) were 13495 kg, returns on main produce was Rs 125720 and by produce was Rs 40485, total gross return was Rs 166205 and net returns was Rs 70761.33, input-output ratio was 1:1.74. Under medium category total yield of cashewnut (main produce) was 914 kg and cashew fruit (by produce) were 14105 kg, returns on main produce was Rs 127960 and by produce was Rs 42315, total gross return was Rs 170275 and net returns was Rs 77072.72, input-output ratio was 1:1.83. Average of all the size group is, average yield of cashewnut (main produce) is 883.25 kg and cashew fruit (by produce) are 13000 kg, average returns on main produce was Rs.123655 and by produce was Rs. 39000 and avg. gross return was Rs. 162655 and avg. net returns was Rs. 66342.49 and input-output ratio was 1:1.69. Table 3 also revealed that farm business income of medium farmer was highest i.e., Rs 110040.65 followed by semi medium Rs 105718.02, small Rs 98639.88 and marginal Rs 94384.13 and average farm business income of all the category was Rs 102195.67. Family labour income was highest in medium farmer i.e., Rs 86745.65 followed by semi medium Rs 82438.02, small Rs 75374.88 and marginal Rs 71134.13 and average family labour income was Rs 78923.17. Farm investment income was highest in medium farmer i.e., Rs 108840.65 followed by semi medium Rs 102718.02, small Rs 94139.88 and marginal Rs. 87784.13 and Average farm investment income of all the category was Rs. 98370.67.

**Table 3 Yields obtained and Returns realized in Cashewnut Cultivation (5th year onwards) (Rs/ha)**

Sr. No	Particulars	Marginal	Small	Semi medium	Medium	Sample Average
1	<b>Yield obtained in Cashew</b>					
	Main produce (nuts in kg)	850	871	898	914	883.25
	By produce (cashew fruit in kg)	12000	12400	13495	14105	13000
	Returns on main produce (Rs)	119000	121940	125720	127960	123655
	Returns on by produce (Rs)	36000	37200	40485	42315	39000
2	<b>Gross returns (Rs)</b>	<b>155000</b>	<b>159140</b>	<b>166205</b>	<b>170275</b>	<b>162655</b>
3	<b>Total Cost cultivation (Rs)</b>	<b>99512.45</b>	<b>97091.63</b>	<b>95443.67</b>	<b>93202.29</b>	<b>96312.51</b>
4	<b>Farm Business income</b>	<b>94384.13</b>	<b>98639.88</b>	<b>105718.02</b>	<b>110040.65</b>	<b>102195.67</b>
5	<b>Family Labour income</b>	<b>71134.13</b>	<b>75374.88</b>	<b>82438.02</b>	<b>86745.65</b>	<b>78923.17</b>
6	<b>Farm investment income</b>	<b>87784.13</b>	<b>94139.88</b>	<b>102718.02</b>	<b>108840.65</b>	<b>98370.67</b>
7	<b>Net returns (Rs)</b>	<b>55487.55</b>	<b>62048.37</b>	<b>70761.33</b>	<b>77072.72</b>	<b>66342.49</b>
8	<b>Input-output Ratio</b>	<b>1:1.56</b>	<b>1:1.64</b>	<b>1:1.74</b>	<b>1:1.83</b>	<b>1:1.69</b>

\*Cashewnut price = Rs 140/kg                      Cashew fruit price = Rs 3/kg

## SUMMARY

The average cost of establishment for per hectare was Rs.172538.67. the cost in the 1<sup>st</sup> year was Rs. 51905.5, 2<sup>nd</sup> year Rs.39313.67, 3<sup>rd</sup> year 40344.25 and 4<sup>th</sup> year 40975.2. From establishment cost it can be seen that the highest cost was spent in 1<sup>st</sup> year (Investment year) followed by 4<sup>th</sup> year, 3<sup>rd</sup> year and 2<sup>nd</sup> year. The establishment cost for marginal farmer was Rs. 175320.67, small farmer was Rs. 172541.83, semi medium farmer was Rs.171890.83 and medium farmer was Rs.170401.34. It can be clear seen that as farm size increases the total establishment cost decreases. The average cost of cultivation for per hectare was Rs.96312.51. Looking at the various components of cost of cultivation it is clear that hired human labours the largest proportion i.e., Rs. 29285 (30.41%) followed by rental value of owned land i.e., Rs. 20000 (20.77%), miscellaneous i.e., Rs. 19739 (20.50%) and then rest of the components of cultivation. Total cost of cultivation (Rs/ha) of marginal category was Rs 99512.45, small category was Rs 97091.63, semi medium category was Rs 95443.67 and medium farmer was Rs 93202.29. This inferred that medium farmer has comparative advantage over semi-medium, small and marginal farmers i.e., cost of cultivation decreases with increase in farm size. The average yield of cashewnut (main produce) is 883.25 kg and cashew fruit (by produce) are 13000 kg, average returns on main produce was Rs.123655 and by produce was Rs. 39000 and avg. gross return was Rs. 162655 and avg. net returns was Rs. 66342.49 and input-output ratio was 1:1.69. This means that when you invest 1 rupee you are getting 1.69 rupee as return and 0.69 as net return. The net returns were highest for medium farmers i.e., Rs. 77072.72 followed by semi medium farmers Rs. 70761.33, small Rs. 62048.37 and marginal farmers Rs. 55487.55. Input-output ratio was also more in medium category (1:1.83) followed by semi medium (1:1.74), small (1:1.64) and marginal (1:1.56).

## CONCLUSION

The study reveals the comparative advantages of medium farmers over semi medium, small and marginal farmers in terms of production and profitability, it is found that as size increases total cost of cultivation decreases. Total cost of cultivation (Rs/ha) of marginal category was Rs 99512.45, small category was Rs 97091.63, semi medium category was Rs 95443.67 and medium farmer was Rs 93202.29. the gross returns were highest for medium farmer i.e., Rs. 170275 followed by semi medium farmers Rs. 166205, small Rs. 159140 and marginal Rs.155000. Input-output ratio was also more in medium category (1:1.83) followed by semi medium (1:1.74), small (1:1.64) and marginal (1:1.56), Similar findings were also observed by **Pritam, B. S., & Ramchandra (2021)**. This shows that there is increasing return to scale. This means that Cashew nut production is more profitable to medium farmers as compared to semi-medium, small, and marginal farmers.

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