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Cashew nut industry in India: Production, processing, and marketing

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Abstract
Cashew (*Anacardium occidentale*) holds global significance as one of the most important plantation crops, contributing substantially to rural employment, industrial development, and India's foreign exchange earnings. Introduced by the Portuguese in the 16th century, cashew has evolved into a major agro-based industry, with India now ranking as the second-largest producer and processor worldwide. This paper comprehensively examines the cashew sector in India, covering its history, global and domestic production trends, cost of cultivation, profitability, processing techniques, marketing channels, products and by-products, SWOT analysis, and institutional support. Findings reveal that despite cashew's profitability and its role in livelihood security, challenges such as low orchard productivity, high processing costs, and dependence on imported raw nuts persist. At the same time, opportunities exist in mechanization, product diversification, and value addition, supported by agencies like the Directorate of Cashew Nut and Cocoa Development (DCCD) and the Cashew Export Promotion Council of India (CEPCI). Strengthening productivity, enhancing processing efficiency, and expanding value-added products will be crucial for sustaining India's competitiveness in the global cashew industry.

Keywords: Cashew, production trends, cost of cultivation, marketing channels, value addition

1. Introduction
Anacardium occidentale, commonly known as the cashew tree, is a tropical evergreen species belonging to the family *Anacardiaceae*. Native to South America, it is now cultivated extensively across many tropical regions for its valuable nut and cashew apple. According to Yousafzai *et al.* (2022) [14], cashews rank third globally in nut production and are traded worldwide, with around 32 countries engaged in commercial production. The global cashew market is valued at approximately USD 12 billion, driven primarily by the rising consumption of cashew kernels. Increasing health awareness and higher disposable incomes in emerging economies such as China, Vietnam, and India have further contributed to this growth (Pattanayak *et al.*, 2023) [13].
Indian cashews are globally recognized for their superior texture and quality (Directorate of Cashew nut and Cocoa Development, 2023). To enhance revenue generation, employment opportunities, profitability, food security, and global competitiveness, it is essential to prioritize the systematic cultivation and promotion of cashew production. However, farmers often receive a much smaller share of the final price compared to what consumers pay for value-added products. A lack of effective collaboration among farmers, processors, and intermediaries within the supply chain has restricted farmers' share of returns, highlighting the need for improved market integration and cooperative strategies (Das *et al.*, 2021) [6].

2. History
The cashew tree, native to northern South America, was introduced to India by the Portuguese in the 16th century primarily for soil erosion control along the coastal belt. The crop adapted well to Indian conditions and spread along the west and east coasts, particularly in Kerala, Tamil Nadu, Karnataka, and Andhra Pradesh.
Commercial-scale cultivation began in the early 1960s, transforming cashew into an export-oriented commodity that generates significant foreign exchange. Cashew nut processing as an industry started in the 1920s when Roch Victorian established operations in Quilon

(Kerala). W.T. Anderson set up the first commercial processing unit under the name *Indian Nut Company*, which primarily supplied kernels to the USA. Rising global demand led India to begin importing raw nuts from African countries by 1939.

Institutional support strengthened the sector's growth: the Cashew Export Promotion Council (CEPCI) was established in 1955 to encourage exports, and the Directorate of Cashew nut and Cocoa Development (DCCD) was created in 1966 to coordinate research and development. Cashew development gained momentum from the Fourth Five-Year Plan onwards, with projects focused on varietal improvement, productivity enhancement, and processing modernization. By the Seventh Plan, nearly 25 high-yielding varieties had been developed, contributing to increased production and improved quality (Kumar *et al.*, 2012) [12].

3. Use of cashew nut

Cashew kernels are a major snack and ingredient in confectionery, bakery products, and health foods. Their high content of unsaturated fatty acids makes them beneficial for cardiovascular health. By-products such as Cashew Nut Shell Liquid (CNSL) are extensively used in industrial applications, including resins, brake linings, and coatings. The cashew apple is processed into juice, jams, and fermented beverages, providing additional value streams (Kumar *et al.*, 2012) [12].

4. Global scenario of cashew nut

Cashew nuts are consumed across almost all continents but are cultivated in select tropical regions. Major producers include Asian countries such as India, Vietnam, Thailand, and the Philippines, as well as West and East African countries and Brazil. Limited cultivation is also reported in Sri Lanka, Australia, and other smaller regions.

Global production of cashew nuts reached approximately 3.94 million metric tons during 2021-2023. Africa contributes the largest share at 53%, followed by Asia with 41%. India accounts for about 20% of global production, making it the second-largest producer after Côte d'Ivoire, which leads with 1.04 million metric tons. Vietnam ranks third, producing about 0.35 million metric tons, while Brazil, Indonesia, Cambodia, and other countries contribute smaller shares (FAOSTAT, 2023).

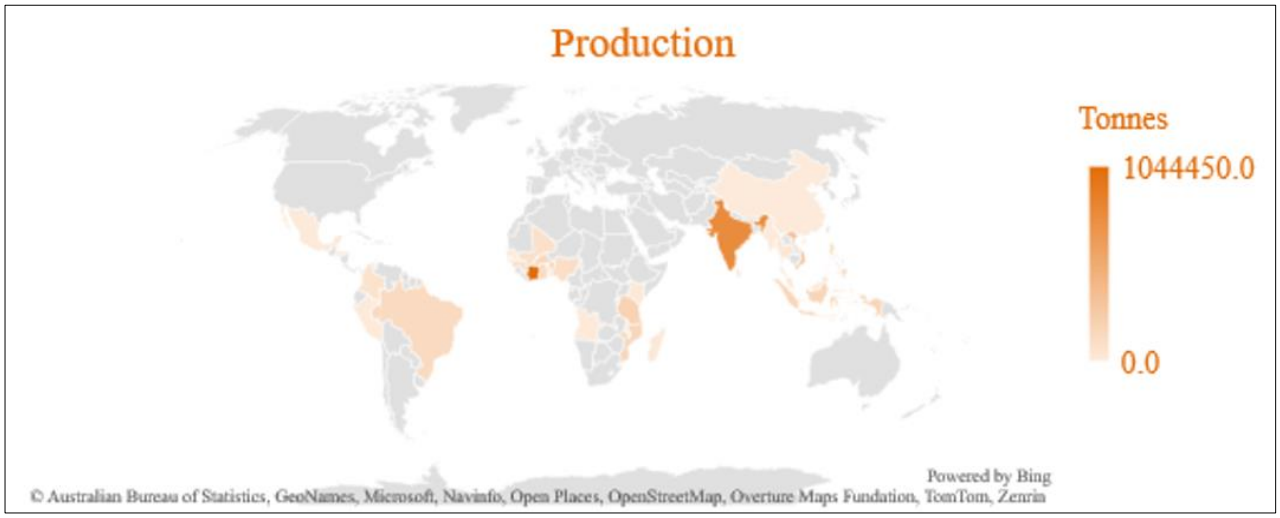

Fig 1: Cashew growing countries

According to FAO (2023), global production of cashew nuts (with shell) has shown a steady upward trend between 2014 and 2023. Production increased from 2.93 million metric tons in 2014 to a peak of 3.94 million metric tons in 2023. Although minor fluctuations were observed after 2018, the overall trend indicates consistent growth, reflecting rising global demand for cashew kernels.

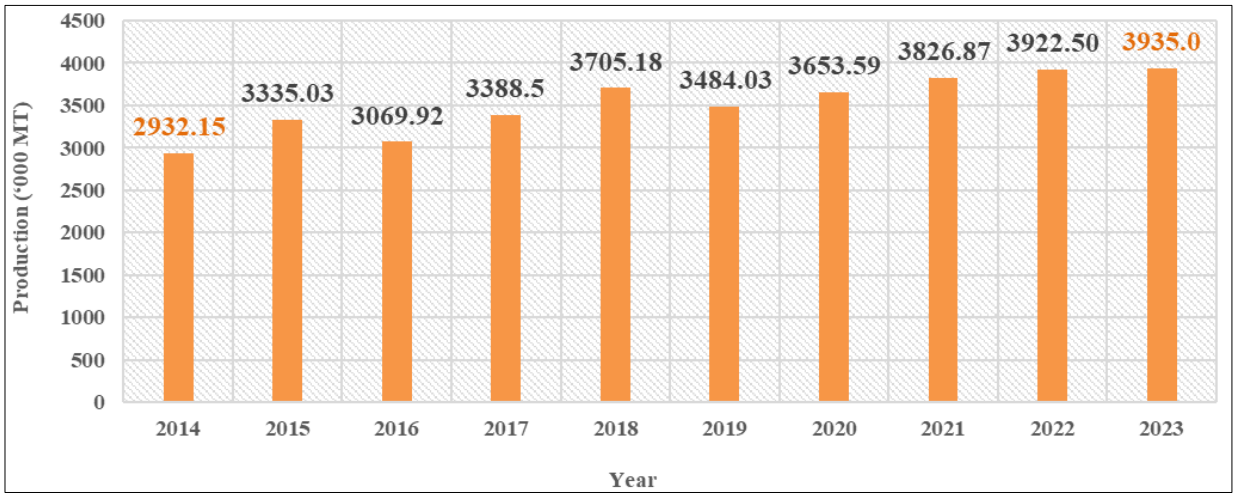

Fig 2: Production quantities of cashew nuts with shell in the World

According to FAOSTAT (2023), the top 10 cashew-producing countries collectively account for the majority of global production. Côte d'Ivoire is the leading producer with 1.04 million metric tons, followed by India with 0.78 million metric tons and Vietnam with 0.35 million metric tons. Other significant producers include Tanzania, Benin, Guinea-Bissau, Burkina Faso, Mozambique, Nigeria, and Indonesia. These top producers together dominate global supply, with Africa contributing more than half of the world's total production.

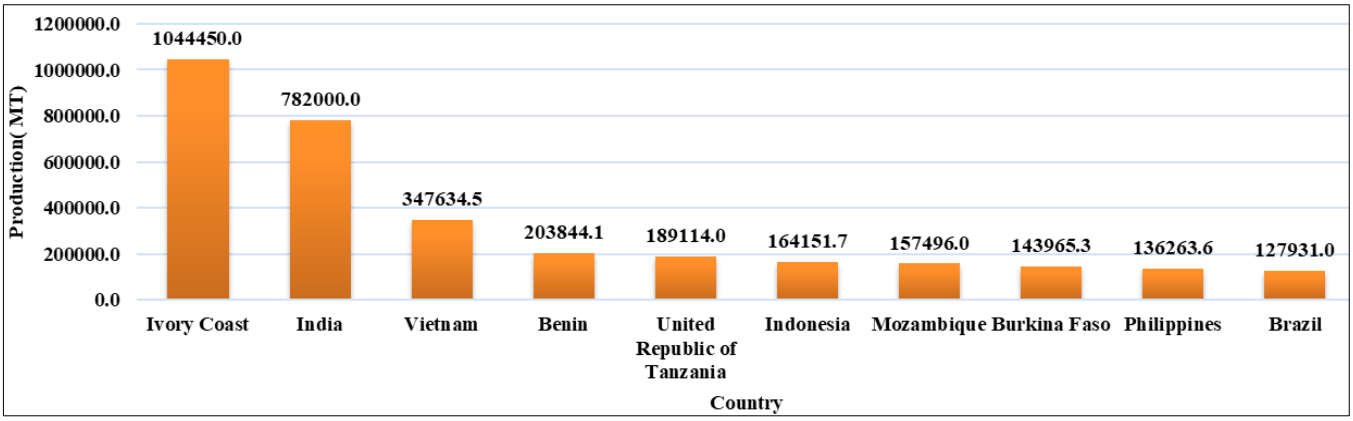

Fig 3: Top 10 cashew nut producing countries (tonnes)

4.1 Top cashew-consuming countries

Global consumption of cashews is led by India, which accounts for the largest share with 301,719 MT, followed by the United States (143,256 MT) and Germany (35,930 MT). Other major consumers include European countries, Australia, Canada, and Japan, indicating a strong international demand for cashew kernels (World Atlas, 2023).

Table 1: Top 10 cashew-consuming countries

Rank	Country	Consumption (MT)
1	India	3,01,719
2	United States	1,43,256
3	Germany	35,930
4	Netherlands	17,236
5	United Kingdom	16,772
6	Australia	16,471
7	Canada	14,267
8	France	8,649
9	Japan	8,040
10	Saudi Arabia	7,854

Source: World Atlas, 2023

5. Indian scenario of cashew nut

Cashew is cultivated across 17 states in India, primarily along the coastal belts. Major growing regions include Maharashtra, Goa, Karnataka, and Kerala on the west coast, and Tamil Nadu, Andhra Pradesh, Odisha, and West Bengal on the east coast. In recent years, cultivation has expanded to non-traditional areas such as the Bastar region of Chhattisgarh, the plains of Karnataka, Gujarat, and Jharkhand. The cashew industry is one of the oldest agro-based industries in the country, employing over one million workers, the majority of whom are women from socio-economically weaker sections. This sector plays a significant role in rural livelihood security and contributes to the country's foreign exchange earnings through kernel exports (CMIE, 2024; CEPCI, 2025) [5, 4].

5.1. Area, production, and productivity of cashew nut in India

Table 2 presents the trends in area, production, and productivity of cashew nut in India over the past decade (2013-14 to 2023-24). The area under cashew cultivation has shown a gradual increase from 1,010.8 thousand ha in 2013-14 to 1,199.1 thousand ha in 2023-24. Production has fluctuated but shows a slight upward movement, rising from 753.2 thousand MT to 794.9 thousand MT over the same period. Productivity, however, has been inconsistent, declining from 745.1 kg/ha in 2013-14 to 674 kg/ha in 2023-24, suggesting the need for interventions such as improved varieties, better crop management, and mechanization (CMIE, 2024) [5].

Table 2: Area, production, and productivity of cashew nut in India during 2013-14 to 2023-24

Year	Area ('000 ha)	Production ('000 MT)	Productivity (kg/ha)
2013-14	1,010.80	753.2	745.1
2014-15	1,029.50	744.9	723.6
2015-16	1,035.60	670.9	647.9
2016-17	978.3	744.7	761.2
2017-18	1,062.00	817	769.3
2018-19	1,105.40	742.7	671.9
2019-20	1,125.20	702.7	624.5
2020-21	1,158.90	738	636.8
2021-22	1,183.90	751.8	635.1
2022-23	1,195.10	781.9	654.3
2023-24	1,199.10	794.90	674

Source: CMIE, 2024

5.3. State-wise area, production, and productivity of cashew nut in India

Table 3 presents the state-wise distribution of area, production, and productivity of cashew nuts in India for 2022-23. Andhra Pradesh has the largest area under cashew cultivation (200.6 thousand ha), followed by Maharashtra (191.6 thousand ha) and Odisha (223.5 thousand ha). Maharashtra leads in production (197.3 thousand MT), contributing the highest share to the national output, followed by Andhra Pradesh (133.8 thousand MT) and Odisha (126.1 thousand MT). Productivity varies significantly across states, with Meghalaya (1,172 kg/ha), West Bengal (1,169 kg/ha), and Assam (1,105 kg/ha) recording the highest yields, while Manipur and Nagaland

have the lowest productivity levels (<400 kg/ha) (DCCD, 2024) [8].

Table 3: State-wise area, production, and productivity of cashew nut in India during 2023-24

State	Area ('000 ha)	Production ('000 MT)	Productivity (kg/ha)
Andhra Pradesh	200.6	133.8	678.4
Assam	1.1	1.2	1,104.80
Chhattisgarh	32.8	22.75	705
Goa	59.95	26	441
Gujarat	13.5	7.38	561
Jharkhand	15.6	6.6	423.6
Karnataka	139.3	79.9	576
Kerala	110	76.6	726
Maharashtra	191.6	197.3	1,003.60
Manipur	0.9	0.3	366.7
Meghalaya	8.8	10.4	1,172.20
Odisha	223.5	126.1	564.5
Puducherry	5	2.3	466
Tamil Nadu	175	80.4	459.5
Tripura	4.3	3.6	835.3
West Bengal	14.6	13.3	1169
Nagaland	1.5	0.55	360
Total	1,195.00	782	674

Source: DCCD, 2024

6. Cost of cultivation of cashew nut (₹/ha)

6.1. Establishment cost of cashew nut cultivation

The establishment cost of cashew cultivation includes the cost of planting seedlings in the investment year (1st year) and the maintenance costs during the 2nd, 3rd, and 4th years, until the plantation starts flowering. These costs are then annualized from the 5th year onwards using an amortization rate of 10% to estimate the annual cost of cultivation over the orchard's productive lifespan.

Table 4 presents the establishment cost of cashew nut plantations in South Goa district for different farm-size categories. The marginal farmers incurred the highest total establishment cost (₹1,75,320.67/ha), whereas medium farmers recorded the lowest (₹1,70,401.34/ha). The overall average establishment cost was ₹1,72,538.67/ha, with the first-year investment (planting cost) contributing the largest share (₹51,905.50/ha), followed by maintenance costs in subsequent years (Kaviraj, 2023) [11].

Table 4: Establishment cost of cashew cultivation (₹/ha)

Sr. No.	Particulars	Marginal	Small	Semi Medium	Medium	Sample Avg.
1	Initial investment (1st Year)	52345	51815.5	51742.5	51719	51905.5
2	2nd Year	39949.67	39655.33	39029	38620.67	39313.67
3	3rd Year	41227	40222	40145.33	39782.67	40344.25
4	4th Year	41799	40849	40974	40279	40975.25
	Total establishment cost	175320.67	172541.83	171890.83	170401.34	172538.67

Source: Kaviraj, 2023

6.2. Annual cost of cultivation of cashew (from 5th year onwards) (₹/ha)

The annual cost of cultivation of cashew plantations (from 5th year onwards) in South Goa district is presented in Table 5. Hired human labour accounted for the highest cost component across all farm-size categories, ranging from ₹28,490/ha in marginal farms to ₹30,140/ha in medium farms, contributing about 30-32% of total costs. This was followed by the rental value of owned land (≈₹20,000/ha, ~21%) and miscellaneous costs (≈₹19,740/ha, ~20%).

The average total cost of cultivation was ₹96,312.51/ha, with the following cost structure:

- Cost A (variable cost): ₹60,459.33 (62.77%)
- Cost B (Cost A + fixed costs): ₹83,731.83 (86.94%)
- Cost C (Cost B + family labour): ₹87,556.83 (90.91%)
- Managerial cost: ₹8,755.68 (9.09%)
- Total Cost of Cultivation: ₹96,312.51 (100%)

This breakdown highlights that labour and land costs are the most significant contributors, indicating potential for cost reduction through mechanization and better resource management (Kaviraj, 2023) [11].

Table 5: Annual cost of cultivation of cashew from 5th year onwards (₹/ha)

Sr. No.	Particulars	Marginal	Small	Semi Medium	Medium	Sample Avg.
1	Hired human labour	28490.00	29000.00	29510.00	30140.00	29285.00
2	Application of FYM	3750.00	3500.00	3220.00	2800.00	3317.50
3	Weeding (weed cutter machine)	1766.59	1720.00	1624.00	1500.00	1652.65
4	Miscellaneous	19978.75	19803.11	19724.16	19453.50	19739.88
5	Plant protection	1120.00	977.00	910.00	865.00	968.00
6	Interest on working capital	5510.53	5500.01	5498.82	5475.85	5496.30
7	Cost A	60615.87	60500.12	60486.98	60234.35	60459.33
8	Depreciation of capital assets	2000.00	2000.00	2000.00	2000.00	2000.00
9	Rent value of owned land	20000.00	20000.00	20000.00	20000.00	20000.00
10	Land revenue	50.00	65.00	80.00	95.00	72.50
11	Interest on fixed capital	1200.00	1200.00	1200.00	1200.00	1200.00
12	Cost B	83865.87	83765.12	83766.98	83529.35	83731.83
13	Family human labour	6600.00	4500.00	3000.00	1200.00	3825.00
14	Cost C	90465.87	88265.12	86766.98	84729.35	87556.83
15	Managerial cost	9046.59	8826.51	8676.70	8472.94	8755.68
16	Total cost	99512.45	97091.63	95443.67	93202.29	96312.51

Source: Kaviraj, 2023

6.3. Yields obtained and returns realized in cashew cultivation (5th year onwards) (₹/ha)

Table 6 summarizes the yield, gross and net returns, and profitability indicators for cashew nut cultivation from the fifth year onwards in South Goa district. Average yield of cashew nut (main produce) was 883.25 kg/ha, while cashew apple (by-produce) averaged 13,000 kg/ha across farm categories. The average gross return was ₹1,62,655/ha, resulting in an average net return of ₹66,342.49/ha and an input-output ratio of 1:1.69, indicating that cashew cultivation is profitable.

Medium farmers recorded the highest yields (914 kg/ha), gross returns (₹1,70,275/ha), and net returns (₹77,072.72/ha), achieving the most favorable input-output ratio (1:1.83). This suggests that economies of scale positively influence profitability in cashew cultivation.

Farm business income, family labour income, and farm investment income followed a similar pattern, with medium farms showing the highest values, reflecting their better resource utilization and returns (Kaviraj, 2023) [11].

Table 6: Yields obtained and returns realized in cashew cultivation (5th year onwards) (₹/ha)

Sr. No.	Particulars	Marginal	Small	Semi Medium	Medium	Sample Average
1	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 (₹)	119000	121940	125720	127960	123655
	Returns on by produce (₹)	36000	37200	40485	42315	39000
2	Gross returns (₹)	155000	159140	166205	170275	162655
3	Total cost of cultivation (₹)	99512.45	97091.63	95443.67	93202.29	96312.51
4	Farm business income (₹)	94384.13	98639.88	105718.02	110040.65	102195.67
5	Family labour income (₹)	71134.13	75374.88	82438.02	86745.65	78923.17
6	Farm investment income (₹)	87784.13	94139.88	102718.02	108840.65	98370.67
7	Net returns (₹)	55487.55	62048.37	70761.33	77072.72	66342.49
8	Input-output Ratio	1:1.56	1:1.64	1:1.74	1:1.83	1:1.69

Source: Kaviraj, 2023

7. Processing of cashew nut

India pioneered cashew nut processing and was the first country to export cashew kernels to the global market. Raw cashew nuts (RCN) collected from farms are quickly processed to preserve quality. Farmers separate the nut from the cashew apple and sun-dry them before sale. The processing industry then converts raw nuts into kernels through a series of well-defined steps (Anon., 2019) [2].

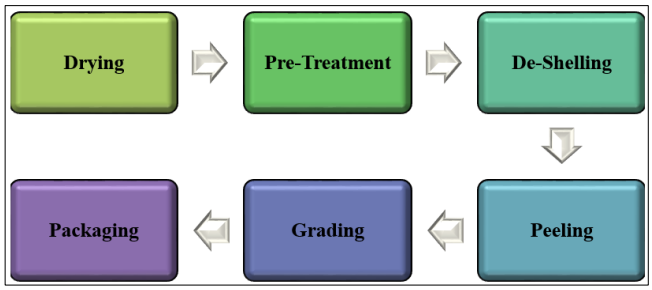

Fig 4: Flow chart of the processing of cashew nut

7.1. Drying

Drying is the first step after procurement. Raw cashew nuts are dried to a maximum moisture content of 9% to prevent deterioration during storage. This can be done on clean concrete floors, tarpaulins, or using modern electric drying machines. Well-dried nuts are packed in jute sacks for warehousing and year-round use.

7.2. Pre-Treatment

Pre-treatment includes calibration, warehousing, and heat treatment.

- **Calibration:** Nuts are sorted by diameter (18 mm, 20 mm, 22 mm, 24 mm, >24 mm) to ensure uniformity for mechanized shelling, reducing breakage and facilitating grading.
- **Warehousing:** Calibrated nuts are stored in jute bags (80 kg each) on pallets, with proper spacing from walls and roofs to prevent moisture absorption, scorching, and pest infestation. Ventilation and fire safety are essential.
- **Heat Treatment:** Steaming, drum roasting, or oil bath roasting makes shells brittle, easing kernel separation. Steaming also concentrates the corrosive cashew nut shell liquid (CNSL) into a jelly-like form, protecting workers' hands.

7.3. De-Shelling

De-shelling separates kernels from shells and aims to maximize whole kernels while minimizing breakage. Shells are removed using manual tools or mechanized machines, with manual separation often required due to incomplete machine efficiency. Protective measures include applying vegetable oils or wearing gloves to prevent skin irritation from CNSL. Kernels are categorized into whole, broken, and rejects. Shells and residual CNSL are repurposed as fuel, biofuel, or processed further, enhancing sustainability.

7.3.1. Oven drying and humidification

Kernels undergo thermal shock, alternating drying and humidification, to loosen the testa without damaging the kernel. Special ovens (Borma) or thermal shock chambers combine these steps efficiently, facilitating subsequent peeling.

7.4. Peeling

Peeling removes the testa from the kernel using mechanized machines and manual methods. Mechanized peeling uses friction and air pressure but may leave residues, requiring manual finishing. Thermal shock effectiveness and kernel peelability influence peeling efficiency, with mechanized peeling resulting in more broken kernels than manual methods.

7.5. Grading

Grading classifies kernels by color, shape, and size. Color categories include white (W), scorched (S), and desert (D), while shape categories include whole (W), butts (B), splits (S), pieces (P), and baby bits (BB). Size is expressed in nuts

per pound (180, 210, 240, 320, 450). For example, WW180 refers to a White Whole kernel of size 180.

Table 7: Grading parameter

Grading parameter	Grading designation
Colour	White (W), Scorched (S), Dessert (D)
Shape	Whole (W), Butts (B), Splits (S), Pieces
Size (nuts/pound)	180, 210, 240, 320, 450

Source: Anon., 2019

7.5.1. Classification order

A white colored whole kernel of size 180 will be referred to as WW180, meaning White, Whole, size 180. Another example of a grade is SW240, meaning Scorched, Wholes, size 240.

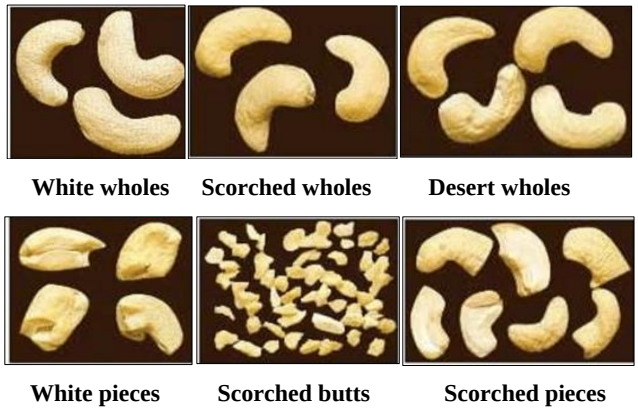

Fig 5: Different grades of cashew nut

7.6. Packaging

After grading, kernels are conditioned to 3.5-4% moisture to prevent breakage or clumping, fumigated to control pests, and packed according to buyer requirements. Vacuum packing with CO_2 and nitrogen extends shelf life, while tin packaging is preferred in Gulf countries. Packaging facilities must comply with international food safety standards to ensure quality and export readiness.

8. Project cost of a small-scale cashew processing unit

Table 8 presents the estimated cost for establishing a small-scale cashew processing unit with a total project cost of ₹158.54 lakh. Major cost components include building and civil structures (₹50.00 lakh) and plant and machinery (₹60.14 lakh), which together account for over 69% of the total investment. Land acquisition and development represent a relatively small share (₹3.30 lakh), while margin money for working capital (₹36.09 lakh) and contingencies (₹5.51 lakh) ensure smooth operations and provision for unforeseen expenses (Anon., 2021) [3].

Table 8: Project cost of small-scale cashew processing unit

Sr. No.	Particulars	Amount (₹ Lakh)
1	Land	3
2	Land development	0.3
	Sub Total	**3.3**
3	Building and civil structures (sqm)	50
4	Plant and machinery	60.14
5	Miscellaneous fixed assets	1
6	Preliminary & pre-operative expenses	2.5
7	Margin money for working capital	36.09
8	Contingencies @ 5 per cent	5.51
	Total project cost	158.54

Source: Anon., 2021

9. Marketing channel of cashew nut

Most cashew nuts reach consumers in the form of kernels or as cashew nut shell liquid (CNSL) after processing. However, marketing channels for raw cashew nuts are generally limited up to the factory gate. In the South Konkan region, cashew growers sell their produce through different intermediaries depending on production scale, liquidity needs, and prevailing prices. Five major marketing channels have been identified for raw cashew nut marketing (Akhare, 2024) [1]:

Table 9: Marketing channels for raw cashew nut

Channel I	**Grower →Village merchant →Wholesaler →Processor**
Channel II	Grower →Itinerant Merchant →Factory agent →Processor
Channel III	Grower →Village merchant →Processor
Channel IV	Grower →Wholesaler →Processor
Channel V	Grower →Processor

Source: Akhare, 2024

9.1. Price spread in the different marketing channels of cashew

Intermediaries involved in cashew marketing perform various functions such as assembling, transporting, and financing, for which they charge marketing costs and margins. Table 10 presents the price spread for different marketing channels in Ratnagiri district. The results indicate that Channel V (direct sale to processor) provided the highest producer share in consumer's rupee (99.69%), followed by Channel IV (98.32%). Channels I and III had a producer share of 91.86%, whereas Channel II recorded the lowest share (84.60%) due to the highest cumulative market margin (14.51%). This finding highlights the advantage of minimizing intermediaries to enhance farmer profitability (Akhare, 2024) [1].

Table 10: Price spread in different marketing channels of cashew (Ratnagiri district)

Sr. No.	Particulars	Channel I (₹ / %)	Channel II (₹ / %)	Channel III (₹ / %)	Channel IV (₹ / %)	Channel V (₹ / %)
1	Price received by the grower	12866.67 / 92.14%	11833.33 / 84.74%	12866.67 / 92.14%	13773.67 / 98.63%	13965 / 100.00%
2	Marketing cost of the grower	38.39 / 0.27%	19.28 / 0.14%	38.39 / 0.27%	42.96 / 0.31%	42.99 / 0.31%
3	Net price received by the grower	12828.28 / 91.86%	11814.05 / 84.60%	12828.28 / 91.86%	13730.71 / 98.32%	13922.01 / 99.69%
4	Purchase price of the itinerant	-	11833.33 / 84.74%	-	-	-
5	Cost incurred by the itinerant	-	42.19 / 0.30%	-	-	-
6	Profit margin of the itinerant	-	1557.81 / 11.16%	-	-	-
7	Purchase price of the village	12866.67 / 92.14%	-	12866.67 / 92.14%	-	-

	merchant					
8	Cost incurred by the village merchant	64.96 / 0.47%	-	64.96 / 0.47%	-	-
9	Profit margin of the village merchant	859.37 / 6.15%	-	1033.37 / 7.40%	-	-
10	Purchase price of the wholesaler	13791 / 98.75%	-	-	13773.67 / 98.63%	-
11	Cost incurred by the wholesaler	80.24 / 0.57%	-	-	80.24 / 0.57%	-
12	Profit margin of wholesaler	93.76 / 0.67%	-	-	111.09 / 0.80%	-
13	Purchase price of the factory agent	-	13433.33 / 96.19%	-	-	-
14	Cost incurred by the factory agent	-	63.12 / 0.45%	-	-	-
15	Profit margin of the factory agent	-	468.55 / 3.36%	-	-	-
16	Processor purchase price	13965 / 100.00%	13965 / 100.00%	13965 / 100.00%	13965 / 100.00%	13965 / 100.00%
17	Total market margin	953.13 / 6.83%	2026.36 / 14.51%	1033.37 / 7.40%	111.09 / 0.80%	-
18	Producer's share in processor's rupee (%)	91.86%	84.60%	91.86%	98.32%	99.69%

Source: Akhare, 2024

10. Cashew products and by-products

Cashew is a highly versatile crop, and nearly every part of the tree provides an economic product or by-product. The major products and by-products are summarized below:

10.1 Cashew Kernels (Main Product)

Cashew Kernels: The edible nut obtained after processing; consumed plain, roasted, salted, or used as an ingredient in confectionery, bakery, and culinary products.

Value-Added Products

- **Cashew Butter:** Ground cashew paste with a creamy texture, used as a spread or ingredient.
- **Cashew Cheese, Milk, and Yogurt:** Dairy-free alternatives made from soaked and blended cashews, popular among health-conscious and vegan consumers.
- **Cashew Flour:** Gluten-free flour used in bakery and confectionery applications.
- **Cashew Oil:** High-oleic oil used for cooking and cosmetics.

10.2 Cashew Apple Products

- **Cashew Juice:** Rich in vitamin C; consumed fresh, frozen, or fermented into cashew wine.
- **Cashew Apple Bagasse:** Residue after juice extraction; used as animal feed, fertilizer, or for value-added products like pectin.

10.3 Cashew By-Products

- **Cashew Nut Shell Liquid (CNSL):** A dark brown phenolic liquid extracted from shells, used in manufacturing resins, brake linings, paints, and coatings.
- **Cashew Shell Cake:** Residue after CNSL extraction, used as biofuel or processed into fuel briquettes for industrial use.

11. Swot analysis of cashew nut

According to Ganesan *et al.* (2022) [15], the SWOT analysis of cashew nut was as follows;

11.1. Strengths

The cashew nut industry possesses several notable strengths that ensure its continued prominence. Being the world's largest producer of raw cashew nuts and a major processor provides significant control over the supply chain, which helps maintain product quality and influence market prices. A strong domestic market with high consumption ensures a reliable customer base. The ability to utilize broken cashews for value-added products reduces waste and generates additional revenue streams. Moreover, spreading production across diverse regions mitigates risks associated with regional disruptions. A long-standing presence in international markets has fostered well-established trade relationships and extensive industry expertise. Together, these strengths make the cashew nut industry both dominant and adaptable.

11.2. Weaknesses

Despite its strengths, the cashew industry faces several weaknesses. Low mechanization limits efficiency and increases production costs. Inadequate infrastructure and uneven market conditions can disadvantage producers. Limited productivity in cultivation restricts overall output, while high processing costs reduce competitiveness in the global market. Dependence on imported resources adds further vulnerability. Additionally, insufficient value addition through advanced processing and weaker branding limit market share and profitability. Addressing these weaknesses requires modernization, infrastructure improvement, and strategic development to ensure sustainable growth.

11.3. Opportunities

The industry has numerous opportunities for expansion and growth. Maintaining high-quality products compared to competitors enhances brand reputation and customer loyalty. Years of trade experience have established trust with international buyers. A readily available skilled workforce supports efficient production and processing. Growing global and domestic demand for cashews provides a strong, expanding market. The availability of ample land allows for potential cultivation expansion to meet rising demand. Furthermore, increasing awareness of the nutritional benefits of cashews presents an opportunity to target health-conscious consumers, driving further market growth.

11.4. Threats

The cashew industry faces several external threats. Emerging cashew-producing countries that are beginning to process and export could reduce market share. Rising living costs and production expenses may compress profit margins. Strict quality standards imposed by importing countries could necessitate expensive upgrades to comply. Competitor nations offering lower production costs may undermine pricing advantages. Additionally, heavily subsidized production inputs and external funding in other countries

may create an uneven competitive landscape, potentially disrupting market stability.

12. Institutional support for cashew nut

The cashew sector in India is supported primarily by the Directorate of Cashew Nut and Cocoa Development (DCCD) and the Cashew Export Promotion Council of India (CEPCI). DCCD is responsible for formulating and implementing development programs, promoting new planting and replanting, coordinating with central and state institutes, and advising on crop development, marketing, and by-product utilization. It also functions as a data bank on production, prices, and trade while disseminating technology among farmers. Key achievements include training 17,955 farmers, developing 37 high-yielding varieties, operating 43 model nurseries, generating 12 million clones annually, covering 3.92 lakh ha with high-yielding clones, expanding total cultivation to 11.95 lakh ha, producing 7.81 lakh metric tonnes of raw nuts, generating Rs. 2,868 crores in export earnings, and employing to 1 million people (DCCD, 2025) [7]. CEPCI, under the Department of Commerce and Industry, promotes the export of cashew kernels, cashew nut shell liquid (CNSL), and allied products through market research, international trade fairs, buyer-seller meets, trade delegations, and studies on nutritional and health benefits. It also supports processors and exporters in improving infrastructure, obtaining quality certifications (ISO, HACCP, BRC), conducting scientific and clinical research, promoting mechanization and automation, and training processors in Good Manufacturing Practices to enhance production and export standards (CEPCI, 2025) [4].

13. Conclusion

Cashew has grown from an introduced crop to one of India's most important plantation commodities, contributing significantly to rural livelihoods, women's employment, and foreign exchange earnings. With India being the second-largest producer and processor of cashew, the sector enjoys strong domestic demand and a well-established processing industry. However, challenges such as low productivity in orchards, high processing costs, dependence on imported raw nuts, and rising competition from countries like Vietnam and Côte d'Ivoire continue to limit its potential.

Despite these constraints, cashew cultivation and processing remain profitable with favourable returns and opportunities for value addition through by-products like cashew nut shell liquid and cashew apple products. Institutional support from agencies such as DCCD and CEPCI has played a vital role, but future growth will depend on productivity enhancement, mechanization, diversification, and stronger policy interventions. By addressing these issues, the Indian cashew industry can strengthen its global competitiveness while ensuring sustainable rural development.

14. Suggestions

To strengthen the Indian cashew industry, priority should be given to improving farm productivity through high-yielding varieties and better crop management, along with mechanization in processing to reduce costs and improve efficiency. Expanding value addition and product diversification, particularly from cashew apples and CNSL, will enhance profitability. Strengthening direct marketing channels can increase farmers' share in consumer prices. Finally, stronger institutional and policy support focusing on research, innovation, and farmer cooperatives is essential for sustaining global competitiveness and ensuring long-term growth.

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