

Innovative Strategies for Promoting Cashew Cultivation and Enhancing Productivity in Marginalized Regions

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Abstract

The study assessed the factors affecting low yield of cashew among farmers in Srikakulam district, Andhra Pradesh State. It examined the socio-economic characteristics, factors contributing to cashew low yield, sources of cashew planting materials and sources of information on cashew cultivation among farmers in the study areas. Data collection was through structured questionnaire administered on 300 respondents selected through a proportionate random sampling method. Descriptive statistics and chi-square were used in data analysis. Results showed that majority of the farmers were ageing with a mean age of 54 years and had more than 15 years of cashew farming experience. Most (80%) cashew farms were over 30 years old, indicating that the cashew trees, though very old, were still in their productive stage. The majority of respondents obtained planting materials from fellow farmers and their own farms, with no apparent use of hybrid or high-yield grafted plants. Chi-square results revealed a significant relationship ($p < 0.05$) between insect pest attacks, poor cashew prices, lack of improved varieties, farm abandonment, high labor costs, and inadequate farm maintenance. Stakeholders in the cashew value chain should address these factors affecting low yield through a comprehensive government intervention program.

Keywords: Cashew productivity, Hybrid varieties, Integrated crop management

1. Introduction

India is among the largest cashew-producing countries in the world. The cashew industry has large economic significance as it employs more than 15 lakh people on farms and factories in rural areas. The cultivation of cashews in India covers a total of 0.7 million hectares of land, and the country produces over 0.8 million tonnes (MT) annually. Between 2019-20 and 2021-22, India's cashew nut production grew from 0.70 MT to 0.77 MT. In India, cashew cultivation is spread along the coastal regions of the peninsula. Cashew is mainly grown in states like Maharashtra, Kerala, Karnataka, Tamil Nadu, Andhra Pradesh, Goa, Orissa, West Bengal, and some parts of the North-Eastern region. According to data published by the National Horticulture Board (NHB), Maharashtra stands first in annual cashew nut production during 2021-22 at 0.20 MT, growing from 0.19 MT cashew nut produced in 2020-21. Over the

years, India has emerged as the global processing hub for the cashew industry. Between April 2023 to March 2024, the cashew exports by value stood at US\$ 339.21 million as against US\$ 356.32 million in April 2022 to March 2023, registering a decline of 4.80% (*Ministry of commerce and Industry, APEDA agri exchange*). Between April 2023 to March 2024, the cashew exports by value stood at US\$ 339.21 million as against US\$ 356.32 million in April 2022 to March 2023, registering a decline of 4.80%. Importing of raw cashew nuts has played a key role in the growth of the Indian cashew industry, which accounts for almost half of the domestic and export demand for cashew kernels in the country. To address the same, the *Department of Agriculture, Cooperation and Farmers Welfare (DAC&FW)*, under the Mission for Integrated Development of Horticulture (MIDH) and Rashtriya Krishi Vikas Yojana (RKVY), had implemented various initiatives that led to increased domestic production of cashew. It includes massive area expansion under cashew cultivation and replacing senile cashew plantations with high-yielding varieties in traditional and non-traditional states. DAC&FW also approved the roadmap program to extend the cashew cultivation area by 1.20 lakh hectares presented by the *Directorate of Cashew nut & Cocoa Development (DCCD)*. Besides the vast scale of cashew production, The yields in India are poor at 860 kg/ha as compared to 4,125 kg/ha in Vietnam and 2,000 kg/ha in Nigeria (*FAO, Food and agricultural organization*). The growth of which is almost stagnant over the last decade. If India is to maintain its market share, keep up with the fast increasing worldwide demand, and stay ahead of the rapidly emerging competitors in the global market, it is imperative that it expand and fully exploit its potential. It generated a respectable amount of foreign exchange, but the disparity between the demand from the processing industries and the actual production of raw cashews has forced India to import raw cashews, necessitating a change in policy to promote more domestic production and prevent the loss of valuable foreign exchange. Its product potentials had not been well harnessed due to varied factors ranging from low yielding plantations to inadequate farm management, processing facilities and marketing problems. Senile trees and poor pre-harvest management attribute to the low productivity of cashew in India. The issue of declining production has remained a serious challenge to all stakeholders in the cashew value chain. In view of this, the study was designed to address the inherent challenges associated with cashew field production in order to proper possible solutions. The main objective of the study was to assess the factors contributing to low yield of cashew among farmers in district of srikakulam in Andhra Pradesh state. The paper also deals with production practices in vogue and the improved practices for higher production and productivity.

2. Global Cashew Production- India's Role

India is the second-largest producer of cashew nuts with shell in the world, with a production of 738.00 thousand metric tons in 2021, accounting for 19.90% of the global production. The leading producer, Côte d'Ivoire, produced 837.85 thousand metric tons, representing 22.59% of the global share.

Other significant producers include Vietnam (399.31 thousand metric tons), Philippines (255.93 thousand metric tons), and Tanzania (210.79 thousand metric tons). India's significant contribution underscores its vital role in the international cashew market. Favorable climatic conditions and extensive farming expertise have positioned the country as a major player. The industry contributes substantially to India's economy through both domestic consumption and exports, providing income for many farmers, especially in states like Maharashtra, Andhra Pradesh, and Kerala. Government initiatives aimed at improving farming practices, yields, and supporting farmers have been crucial. Despite its strong position, India faces challenges such as the need for modern farming techniques, pest management, and efficient water use. Addressing these challenges can further enhance productivity and sustainability. With continued support and innovations, India has the potential to increase its production and possibly close the gap with Côte d'Ivoire, ensuring its continued prominence in the global cashew industry. The table -1 provided data highlights import trends from various countries between 2020 and 2022. Vietnam stands out as a major trading partner, with imports peaking in 2021 at 2,53,54,50,091 units valued at \$3,619.82 million, before declining to 1,66,94,84,154 units worth \$2,299.09 million in 2022. India also shows a consistent upward trend, with imports increasing from 87,40,81,566 units (\$1,086.93 million) in 2020 to 1,37,49,30,042 units (\$1,885.75 million) in 2022.

Table-1-Global cashew Import.

Qty(kgs) Value (Value in Mill. US\$)

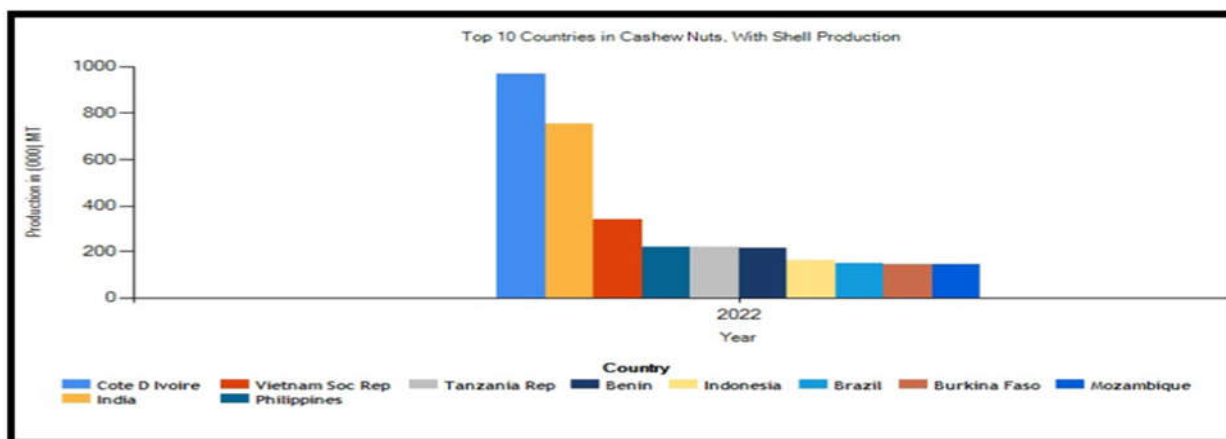
Country	2020		2021		2022	
	Qty	Value	Qty	Value	Qty	Value
Vietnam Soc Rep	1,23,36,43,288.00	1,418.76	2,53,54,50,091.00	3,619.82	1,66,94,84,154.00	2,299.09
India	87,40,81,566.00	1,086.93	87,42,63,935.00	1,126.25	1,37,49,30,042.00	1,885.75
Brazil	0	0	0	0	1,48,74,700.00	17.57
China P Rp	1,59,46,898.00	15.88	1,41,32,535.00	12.7	99,21,478.00	11.11
Indonesia	44,432.00	0.02	5,65,146.00	0.61	37,26,683.00	4.79
Belgium	2,78,852.00	3.06	3,51,971.00	4.12	2,46,586.85	3.09
Canada	1,02,663.00	0.44	1,43,098.00	0.83	3,90,139.89	2.02
Maldives	0	0	1,09,608.00	1.27	1,67,695.12	1.55

Table-2-Global cashew Production

Sr No.	Country	2021		2022	
		Production (MT)	Share (%)	Production (MT)	Share (%)
1	Côte d'Ivoire	837.85	22.59	970	25.18
2	India	738	19.9	751	19.88
3	Vietnam	399.31	10.77	341.86	9
4	Philippines	255.93	6.9	217.56	5.65
5	Tanzania	210.79	5.68	216.91	5.63
6	Indonesia	170.46	4.6	215	5.58
7	Benin	150.41	4.66	166	4.32
8	Burkina Faso	137.72	3.71	147.14	3.82

Source: UN Com-trade, as reported by the Importing countries

The table showcases data on Cashew Raw Nut Imports in terms of quantity (measured in metric tons, MT) and value (in crores of rupees) across the financial years 2012-13 to 2021-22. Over this period, the quantity of imports has shown significant variation, peaking at 9,58,339 MT in 2015-16 and dipping to a low of 6,49,050 MT in 2017-18.

Graph1-Global Cashew Production.

(Source: UN Com-trade, as reported by the Importing countries)

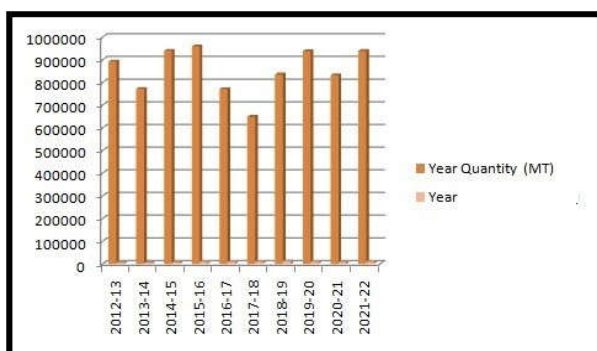
Correspondingly, the import value also fluctuates, with the highest value recorded at ₹10,929 crores in 2018-19 and the lowest at ₹4,563.99 crores in 2013-14. Notably, while the quantities and values tend to move together, 2018-19 stands out as an anomaly, where value reached its maximum despite a moderate quantity of imports. The data highlights the dynamic nature of the cashew import market, influenced by both trade volumes and market prices.

Table:3 Decadal Growth rates of Cashew Kernel Export and Raw Cashew Import

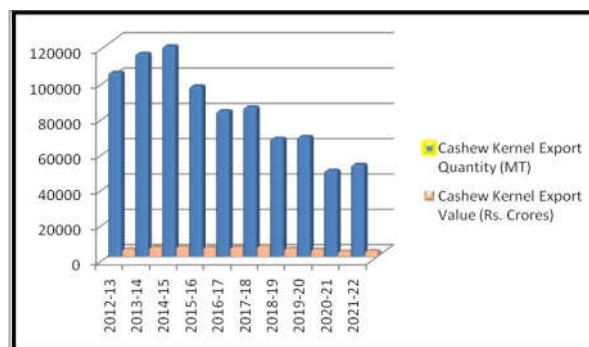
S.no	Year	Cashew Kernel Export		S.no	Year	Rawnut Cashew Import	
		Quantity (MT)	Value (Rs. rores)			Quantity(MT)	Value (Rs. rores)
1	2012-13	104015	4067.21	1	2012-13	892160	5331.12
2	2013-14	1,14,791	5058.73	2	2013-14	7,71,356	4563.99
3	2014-15	1,18,952	5432.85	3	2014-15	9,39,912	6570.93
4	2015-16	96,346	4952.12	4	2015-16	9,58,339	8561.01
5	2016-17	82,302	5168.78	5	2016-17	7,70,446	8839.42
6	2017-18	84,353	5870.97	6	2017-18	6,49,050	8850.03
7	2018-19	66,693	4433.99	7	2018-19	8,35,463	10,929.00
8	2019-20	67,647	3867.165	8	2019-20	9,38,038	8861.58
9	2020-21	48,576	2840.386	9	2020-21	8,31,231	7331.28
10	2021-22	51,908	3096.811	10	2021-22	9,39,200	9338.33

(Source DCCD)

Graph: 3 Decadal Growth rates of Cashew Kernel Export and Raw Cashew Import



(Source DCCD)



3. Cashew Productivity of Andhra Pradesh

The productivity of cashew nuts in Andhra Pradesh stands at 764 kg per hectare, positioning it in the middle tier among other states. The table provides insights into the production and productivity of various states based on the area under cultivation. Maharashtra leads with the highest productivity, almost more than double that of Andhra Pradesh. This high productivity can be attributed to better farming practices, favorable climatic conditions, and perhaps more efficient resource management. These states have moderate productivity, with Kerala and Gujarat performing significantly better than Andhra Pradesh. These regions might have more structured agricultural practices and support from local agricultural policies. Andhra Pradesh, with productivity of 764 kg/ha, is performing better than few states but lags

behind the high and moderate productivity states. Several factors could contribute to this, including less favorable climatic conditions, less efficient agricultural practices, or fewer resources allocated to cashew-farming.

Table 3.1: Area and Production of India States (2022-2023)

S.No	State	Area (000 Ha)	Production (000 MT)	Productivity(Kg/Ha)
1	Kerala	108.589	71.76	839
2	Karnataka	138.867	74.86	653
3	Goa	59.444	24.82	491
4	Maharashtra	191.551	189.71	1145
5	Tamil Nadu	174.960	77.3	594
6	Andhra Pradesh	198.848	127.22	764
7	Odisha	223.450	121.28	655
8	West Bengal	14.552	12.768	1169
9	Jharkhand	15.580	6.35	424
10	Chhattisgarh	32.585	21.44	716

(Directorate of Cashewnut and Cocoa Development, Kochi.)

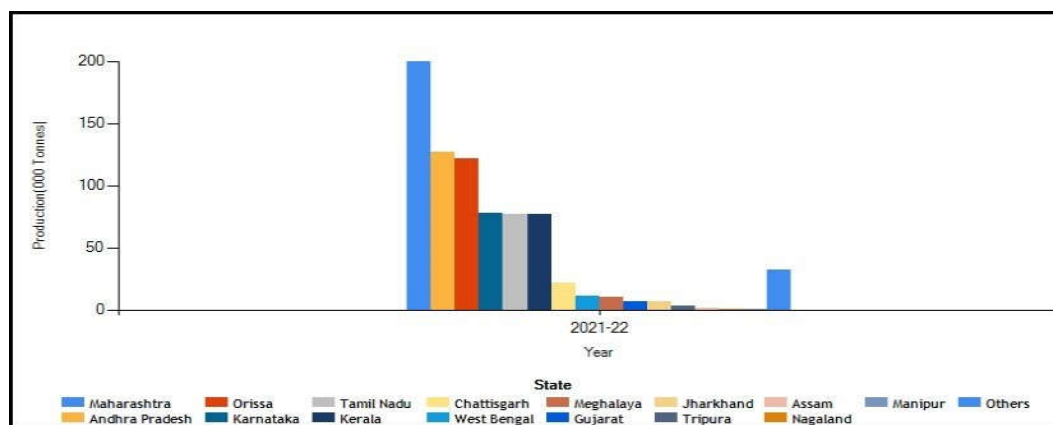


Table 3.2: District Wise Cashew Production in Andhra Pradesh State.*(Production (Tonnes))*

S.No.	District	2014 - 2015	2015 - 2016	2016 - 2017	2017 - 2018	2018 - 2019	2019 - 2020
1	Visakhapatnam	5,638	9,005	11,667	20,421	24,180	34,663
2	East godavari	15,159	9,984	13,943	19,735	26,714	33,394
3	Srikakulam	8,623	7,775	8,648	28,645	21,219	26,714
4	West godavari	6,435	11,457	9,026	7,689	13,124	16,695
5	Vizianagaram	3,438	2,066	4,386	10,146	12,757	3,136
6	Prakasam	335	343	397	1,436	766	957
7	Spsr nellore	74	63	73	970	78	20
8	Krishna	40	43	50	142	94	81

(APEDA & Agri Exchange)

Srikakulam, once a major cashew producer in Andhra Pradesh, has faced fluctuating production trends. While Visakhapatnam's production rose from 5,638 tonnes in 2014-15 to 34,663 tonnes in 2019-20, and East Godavari's from 15,159 tonnes to 33,394 tonnes, Srikakulam peaked at 28,645 tonnes in 2017-18 but dropped to 26,714 tonnes by 2019-20. This inconsistency highlights issues like climate variability, outdated farming techniques, market gaps, and soil degradation. Unlike the other districts, Srikakulam struggled to sustain growth. To revive production, it needs high-yield varieties, modern farming methods, better irrigation, government subsidies, and improved soil health. These steps can help Srikakulam reclaim its status as a leading cashew producer. A yield analysis of cashew production across districts highlights significant disparities, particularly when comparing Srikakulam with other districts. Srikakulam's yield has remained relatively low and inconsistent, showing a decline from 0.39 tonnes/hectare in 2014-15 to 1.03 tonnes/hectare in 2019-20. This sharply contrasts with districts like Prakasam, where the yield peaked at 6.43 tonnes/hectare in 2019-20, and SPSR Nellore, which recorded 6.3 tonnes/hectare in 2017-18 before declining. Meanwhile, Srikakulam's yield fell from 1.19 tonnes/hectare in 2017-18 to 0.87, and then slightly increased to 1.03, indicating production inefficiencies.

Table 3.3: District wise cashew yield in Andhrapradesh*(Yield (Ton./Ha.))*

S.No.	District	2015	2015 - 2016	2016 - 2017	2017 - 2018	2018 - 2019	2019 - 2020
1	Prakasam	0.35	0.37	0.43	7.36	5.51	6.435
2	Spsr nellore	0.35	0.37	0.43	6.3	0.5	3.4
3	Chittoor	0.35	0.37	0.43	1.54	2.06	1.8
4	Krishna	0.35	0.37	0.43	1.84	1.11	1.475

5	Srikakulam	0.39	0.33	0.36	1.19	0.87	1.03
6	West godavari	0.36	0.76	0.78	0.51	1.14	0.825
7	East godavari	0.51	0.34	0.46	0.69	0.91	0.8
8	Visakhapatanam	0.19	0.3	0.41	0.69	0.83	0.76
9	Guntur	0.35	0.38	0.43	0.26	0.84	0.55

(APEDA & Agri Exchange)

Table 3.4: District wise Cashew crop study by area

(Area (Hectare))

S.No.	District	2015	2015 - 2016	2016 - 2017	2017 - 2018	2018 - 2019	2019 - 2020
1	Visakhapatanam	29,367	30,319	28,596	29,770	29,055	34,663
2	East godavari	29,608	29,713	29,985	28,453	29,300	33,394
3	Srikakulam	22,111	23,561	23,823	24,032	24,346	26,714
4	Vizianagaram	13,642	9,743	16,488	17,302	17,801	3,136
5	West godavari	17,678	15,016	11,572	15,045	11,493	16,695
6	Prakasam	958	922	919	195	139	957
7	Spsr nellore	211	169	169	154	156	20

(APEDA & Agri Exchange)

Srikakulam district has seen a steady 21% increase in cashew cultivation from 22,111 hectares in 2014-15 to 26,714 hectares in 2019-20, but it still trails behind Visakhapatnam and East Godavari. Visakhapatnam's area grew by 18% to 34,663 hectares with higher efficiency, while East Godavari maintained stable productivity. Despite Srikakulam's growth, its yield has not matched, indicating issues such as lower yields and inefficient practices. Comparatively, Visakhapatnam and East Godavari achieve higher production levels with similar or slightly larger areas. Srikakulam needs to enhance productivity through modern methods, high-yield varieties, and better irrigation. Even districts like Vizianagaram and West Godavari, with variable cultivation areas, contribute competitively, highlighting the importance of efficient land use and technology adoption.

A comparative study on Cashew Production, Area and Yield.

The cashew production trends in Srikakulam district reveal a steady increase in the area under cultivation but highlight challenges in productivity and yield when compared to other leading districts. The area under cashew cultivation in Srikakulam grew from 22,111 hectares in 2014-15 to 26,714 hectares in 2019-20, reflecting a notable 21% growth. However, the production figures, despite peaking at 28,645 tonnes in 2017-18, declined to 26,714 tonnes by 2019-20, indicating inconsistencies. In

comparison, Visakhapatnam demonstrated exceptional growth, increasing production from 5,638 tonnes to 34,663 tonnes, while maintaining a steady rise in cultivation area from 29,367 hectares to 34,663 hectares. Similarly, East Godavari, with a stable area ranging from 29,608 to 33,394 hectares, achieved a production increase from 15,159 tonnes to 33,394 tonnes, showcasing efficient resource utilization. Srikakulam's yield trends further expose its challenges, with yields fluctuating from 0.39 tonnes/hectare in 2014-15 to a modest 1.03 tonnes/hectare in 2019-20. This is significantly lower when compared to districts like Prakasam, which achieved extraordinary yields of 7.36 tonnes/hectare in 2017-18 and sustained 6.43 tonnes/hectare in 2019-20, or SPSR Nellore with 6.3 tonnes/hectare in 2017-18. Even Visakhapatnam and East Godavari, with their large cultivation areas, managed consistent yield improvements, reaching 0.76 tonnes/hectare and 0.8 tonnes/hectare respectively by 2019-20. The data suggests that while Srikakulam has expanded its cultivation area, it struggles to optimize productivity, likely due to outdated farming methods, poor irrigation infrastructure, and low adoption of high-yield varieties. To address these challenges, Srikakulam needs to prioritize yield optimization through modern cultivation practices, improved irrigation facilities, and farmer support programs. Introducing high-yield varieties, promoting advanced technology adoption, and providing training to farmers can help stabilize production and align Srikakulam's performance with top districts like Visakhapatnam and East Godavari. By addressing these inefficiencies, Srikakulam has the potential to improve its productivity and competitiveness in cashew production.

4. Methodology

A sample size of 300 respondents was selected using a proportionate random sampling method from six villages. The respondents' responses were gathered using a well-structured and pre-tested interview schedule. The study considered twenty independent variables, including age, educational status, occupational status, area under cashew cultivation, experience in cashew cultivation, and usage of innovative technology and modern pest management procedures. Two geo-political zones (Mandalas) were selected. Within each mandala, three villages known for cashew production were chosen: Haripuram, Mandasa, and Anakapalli from Mandasa Mandal, and Metturu, Deppuru, and Cheepurupalli from Vajrapukotturu Mandal. These villages were selected because cashew is the dominant crop in these areas. In each village, fifty farmers were randomly selected, resulting in a total of 300 farmers. A list of cashew farmers in the study area was obtained from the state government-authorized Rythu Bharosa Centers (RBK). For field data collection, a structured interview schedule was employed. Data analysis utilized descriptive statistics and chi-square tests, with variables measured at a 0.05 probability level. This methodology ensures a comprehensive identification of reasons for low production, yield, and productivity.

5. Results and Discussion

5.1. Profile characteristics of the cashew growers

The information on the major constraints experienced in cashew production by the growers in the study area is presented in Table 6. The six villages are grouped into two, with each group consisting of 150 farmers, making a total of 300 farmers. The primary characteristics of the surveyed farmers are: a majority are elderly (63.47%), have a primary school education (34%), and rely on agriculture as their primary occupation (89.22%). The data also indicates a gender disparity in cashew production within the study areas, with a predominantly male workforce (64% male, 36% female). (*Agbongiarhuoyi AE. Aigbekaen EO, Akinbile LA*). Thirty-five percent of respondents were between 55 and 65 years old, with a mean age of 52, suggesting an aging farming population. This demographic trend may negatively impact cashew production and yield. A survey of 300 cashew farmers revealed a diverse range of educational attainment. While a significant portion (34%) had attained primary education, indicating a degree of basic literacy, access to education beyond this level appears limited. Following primary education, secondary education was the next most common level, with 30.67% (92 farmers) having completed it. Smaller percentages pursued higher secondary education (15%, or 45 farmers) and graduation (10.33%, or 31 farmers).

Table-6.1: Analysis on educational levels of farmers

S.No	Area	Tot no Farmers	Illiterate	Primary	Secondary	High Secondary	Graduation	Total
1	Mandasa	50	2	25	12	7	4	50
2	Hariपुरam	50	0	9	12	17	12	50
3	Anakapalli	50	5	10	25	6	4	50
4	Metturu	50	9	12	13	5	11	50
5	Deppuru	50	8	24	14	4	0	50
6	Cheppuru palli	50	6	22	16	6	0	50
	Total	300	30	102	92	45	31	300
	Percentage		10.00%	34.00%	30.67%	15.00%	10.33%	100%

Source: Field survey, 2023 (n=300)

Notably, 10% (30 farmers) were classified as illiterate, highlighting a persistent lack of basic literacy within the farming community. This educational profile suggests a need for improved access to and promotion of higher education within the farming sector, as higher education equips farmers to seek out agricultural innovations, hybrid seeds, or organic farming methods. Further analysis revealed that the majority of respondents (57.67%) had a medium level of annual income, cultivated cashew on 2.00 to 3.00 acres of land (62.50%), and possessed considerable experience in cashew cultivation (55.33%) This

indicates the small-scale nature of most of their farm holdings in the study areas (*Uwagboe EO, Adeogun SO, Odebode SO*). Generally, education is thought to create a favourable mental aptitude for the acceptance of new practices (*Caswell M, Fuglie K, Ingram C, Jans S, Kascak C*).

6.2 Survey of Soil Testing in the Study Area

The data highlights a concerning trend of low soil testing adoption among cashew farmers across six regions, with only 9.33% of respondents conducting soil tests. Haripuram has the highest adoption rate at 24%, while Mandasa and Metturu follow with 12% each. In contrast, regions like Deppuru and Cheppuru Palli show no soil testing activity, with 100% of respondents reporting not testing their soil.

This disparity suggests potential barriers such as lack of awareness, accessibility, or financial constraints.

Table 6.2: Survey of Soil Testing

Sr.No.	Area	No of respondents	Soil Testing Survey				
			Yes	Yes %	No	No %	Total (%)
1	Mandasa	50	6	0.12	44	0.88	100
2	Haripuram	50	12	0.24	38	0.76	100
3	Anakapalli	50	4	0.08	46	0.92	100
4	Metturu	50	6	0.12	44	0.88	100
5	Deppuru	50	0	0	50	1	100
6	Cheppuru palli	50	0	0	50	1	100
8	Total	300	28	0.56	272	5.44	

Source: Field survey, 2023 (n=300)

Soil testing is vital for optimizing productivity, as it helps farmers understand soil nutrient levels and apply fertilizers effectively. The lack of testing could result in nutrient imbalances and reduced crop yields, particularly for a high-value crop like cashew. Addressing this issue requires awareness campaigns, better access to soil testing facilities, and financial support for farmers. Promoting soil testing can enhance land management practices, improve yields, and boost the economic sustainability of cashew farming.

Table 6.3: Survey of cashew yield per acre

S.NO	Yield (80kg per bag)	Frequency (f)	Percentage (%)
1	1-5	137	22.5
2	6-10	66	19.4
3	11-15	36	18.1
4	16-20	31	8.1

5	21-25	16	1.3
6	26-30	8	15.0
7	Above 30	6	15.6
8	Total	300	100

Source: Field survey, 2023 (n=300)

6.3. Analysis of Distribution of Cashew Yields

The table presents data on respondents' cashew yield measured in bags of 80 kg, based on a field survey conducted in 2023 with a sample size of 300 participants. The analysis reveals significant insights into the distribution of cashew yields among the respondents and highlights key trends and disparities in production levels. A closer examination of the table shows that the majority of respondents report low yields. The largest group, comprising 137 respondents (22.5%), produces between 1 and 5 bags of cashew annually. This indicates that low-yielding farmers dominate the sample which clearly indicating that a significant portion of cashew farmers achieve only low to moderate yields. The data paints a clear picture of the distribution of cashew yields, showing that most farmers are clustered in the lower yield categories. This trend may be attributed to several factors, including limited access to agricultural resources, inadequate farming practices, or environmental challenges such as poor soil quality and unpredictable weather patterns. Additionally, the sharp decline in the frequency of higher yields suggests that achieving high levels of production is either highly challenging or requires specific conditions that only a few farmers can meet. The dominance of low yields raises concerns about the overall productivity of cashew farming in the surveyed population. It may reflect systemic issues such as insufficient access to modern farming inputs like fertilizers, improved seedlings, and irrigation systems. Moreover, the lack of technical training and support for farmers could also contribute to this scenario. Without addressing these challenges, the majority of farmers may continue to struggle with low productivity, limiting their income potential and economic stability.

6.4 Factors that Contribute to Low Yield of Cashew

Cashew growers face several significant challenges in their cultivation practices, which adversely impact productivity and profitability. The following are the primary constraints reported at the study area. The table 6.5 indicates the major problems of cashew cultivators in study region. The issues such as lack of knowledge regarding the uses of fertilizers, pesticides, insecticides, high cost of fertilizers, non-availability of high yield varieties, shortage of labour, lack of irrigation facilities are the major variables observed in case of cashew cultivators in study region. All the six villages grouped into 2 categories as G-I and G-II. It was observed that, majority of the cashew growers from all villages expressed high cost of inputs as one of evident from the fact that most farmers supported it. The next constraint faced by the cashew grower were high incidence of pest and diseases on cashew, and which was experienced by

54.67 percentage farmers in the study area.

Table.6.5: Assessing farmers' level of cashew cultivation knowledge.

Sr. No	Particulars	Farmers' Degree of Acceptance					
		G-I	G-II	A(%)	NA%	2 Contrib ution	P value
1	Land Suitability for cashew cultivation	143	146	96.33	3.67	51.56	0.001
2	Knowledge to identify pests and diseases	65	71	45.33	54.67	15.84	0.001
3	Knowledge about application of plant protection Chemicals	56	45	33.66	66.33	39.44	0.03
4	Utilization of Farm Equipment	126	113	79.66	20.33	12.83	0.005
5	Availability of irrigation infrastructure	42	66	36	64.00	33.15	0.002
6	High prevalence of pests and deceases in cashew	85	105	63.33	36.67	0.001	0.000
7	Adoption of hybrid varieties	110	82	64	36.00	0.037	0.05
8	Knowledge on cashew Storage	139	145	94.66	5.33	44.67	0.001
9	Use of fertilizers knowledge	45	65	36.66	63.33	31.68	0.002
10	Use of pesticides knowledge	55	40	31.66	68.33	47.33	0.001
11	High cost of farm labour	125	140	88.33	11.67	28.34	0.003
12	Use of Local Varieties	122	135	85.67	14.33	21.17	0.004
13	High cost of fertilizers	65	82	49.00	51.00	9.26	0.001
14	Impact of imported raw cashew on local yield & Prices	150	150	100	0.00	60.35	0.000

*A=Awareness, *NA=Lack of Awareness (Source: Field survey, 2023 (n=300))

Regarding fertilizer use, it was found that the two biggest obstacles faced by cashew nut growers were ignorance of the use of fertilizers (63.33%) and the belief that fertilizers are unnecessary for cashew nut agriculture (3.33%). Similar to this, 64% of cashew growers expressed interest in high-yielding cashew nut types; nevertheless, the primary barrier was the high cost of cashew grafts, which was followed by the lack of high-yielding cashew nut varieties in the surrounding area (71.33%). In the case of pesticides use, 50.33 per cent cashew farmers expressed high cost was major constraint followed by the growers thinks the no need of pesticides in cultivation of cashew nut (5.30%) and no knowledge of use of pesticides 68.33 %. Regarding fertilizers and manures, 51% of growers say Timely unavailability of manures and fertilizers was the second biggest limitation, after the high cost of manures and fertilizers and the scarcity of organic fertilizers and manures. In a same vein, cashew grower express has irrigation constraints. Summertime water scarcity was a significant obstacle, followed by ignorance on how to handle pest infestations. In the case of plant protection constraint, timely unavailability and unaware

about plant protection was the major problem experienced by 60.33 percent cashew farmers.

6.5. Key Observations:

- **Significant Issues** ($p < 0.05$): Most factors show significant differences, indicating problems like insufficient knowledge, lack of infrastructure, and high costs. Major areas of concern include high fertilizer costs, limited adoption of high-yield varieties, and knowledge gaps. For highly significant chi-square values (like those above), the p-values are extremely small, often close to zero. Each chi-square contribution confirms the statistical significance.
- **Not Significant** ($p > 0.05$): Adoption of hybrid varieties and knowledge on cashew storage appear to be satisfactory. The table highlights critical areas of improvement, particularly in knowledge, cost management, and infrastructure development, to enhance cashew cultivation and productivity.

6.6. Key Points to Consider for Improvement

The findings on farmer's profile would help the extension personnel in understanding the farmers and plan for appropriate strategies so as to increase cashew production in the study area.

- It was shown that the majority of respondents knew just a moderate amount about the best practices for cashew production. To raise the degree of cashew growers' understanding of cashew farming, the State Department of Horticulture is advised to establish more regular contacts and use suitable extension techniques.
- It was found that cashew growing methods were somewhat adopted. Therefore, it is advised that more training courses on cashew farming techniques be made available.
- The application of fertilizer, micronutrients, and manure was shown to have low practice-level adoption of cashew technology. Consequently, it is advised that more training be created in these areas of study.
- The majority of responders indicated high rates of pests and diseases and their ignorance of treatment. Lack of knowledge to identify pests, diseases and plant protection chemicals was the foremost personal constraint reported by the respondents. Appropriate integrated pest management scheme will be necessary to combat insect pest infestation in cashew farms.
- Lack of technical guidance was expressed as a constraint by three-fourth of the respondents. Hence, it is suggested that the State Department of Horticulture may render adequate and timely provided extension service to the cashew growers.

6.7. Prospective studies scope

A comparative analysis of cashew nut production across different states, with a focus on Andhra Pradesh, based on area, production, and yield, highlights the current status of Andhra Pradesh in national and international markets. To improve the knowledge and adoption levels of cashew growers, action research involving researchers, farmers, and extension officials can be undertaken. Additionally, investing in agricultural research to develop high-yield, disease-resistant cashew varieties is essential enhance

production and increase the income levels of the cashew farming community.

6.8. Summary

The details analysis of the constraints faced by the cashew cultivators in study region reveals the following facts. High incidence of pest and diseases etc. are the major issues faced by the cultivators in study region. There is lack of knowledge among the farmers regarding the uses of chemical, fertilizers, pesticides and insecticides. Similarly, the lack of high-yield varieties, high costs of irrigation facilities, delayed pest control treatments, and the high costs of harvesting and cultivation are also major issues faced by farmers in the study region. These constraints collectively hinder the productivity, profitability, and long-term sustainability of cashew cultivation. Addressing these issues through targeted interventions such as farmer training programs, improved technical advisory services, and the development of better storage facilities can significantly improve the livelihoods of cashew growers.

6.9. Conclusion

The study concludes that by addressing above constraints and adopting strategies from more productive regions, Andhra Pradesh has the potential to significantly increase its cashew productivity and contribute more robustly to both the local and national economies. These issues has to be properly addressed by the government through implementing concert short term as well as long term policy framework, in order to get gain of the natural positive externalities to achive high rate of production of cashew nuts in this region.

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