Original Research Article

Exploration of Challenges in Cashew Production:AComparative analysis of Kerala and Tamil Nadu

ABSTRACT

Plantation sector, specifically cashew cultivationplays a pivotal role in boosting farm economy in India. This particular study explores field constraints experienced by cashew growersin Kerala and Tamil Nadu, which affects the cashew cultivation indiscriminately. The key objective is to compare field challenges experienced by cashew growers among major producers in southern regions of India. The methodology implies on multi-stage purposive sampling methodfor selection of states, districts, blocks and gram panchayat, whereas equal proportion of 80 respondents from each stateselected through simple random sampling method. Totally, 160 cashew growers were investigated for data collection through pre-testedstructured interviewschedule.The data-setsanalysed in SPSS software using non-parametric statistical tools. The significant findings were pest and disease infestations, labour scarcity, unstable market price, lack of technical know-how and inadequate processing facilities.Notably, 100per cent of growers reported that, Cashew Stem and Root Borer (CSRB)infestation as a most critical issuein both states. This paper highlights, region-specific and timely technical interventions, commodity-specific assured markets,proper pricing systemand infrastructure development. The study interpretation helps to address the high-priority and specialised constraints through various policy reforms and technical support systems for enhancement of productivity and sustainability of cashew farming in India.

Keywords: Agriculture, Pest, Labour, Markets, Infrastructure, Farmers, Policy, Sustainability

INTRODUCTION

Agriculture serves as backbone of India's economy, supporting livelihoods for 52 percent of the population and contributes 18.1 percent to the country's Gross Domestic Product (GDP), thus playing a pivotal role in employment generation and overall economic growth (Arun, 2017). Among the diverse sectors in agriculture, especially plantation crops like cashew, occupies a special place due to significant contributions to rural income, employment and export earnings. Cashew (*Anacardium occidentale L.*), which originates from the Portuguese word '*Caju'*, was first introduced to India from northeastern Brazil between 1563 and 1570 (Venkattakumar, 2010). Over the centuries passed, it has become well adapted to India's climatic conditions and evolved from its initial use for measures like afforestation and soil conservation into a high-value commercial crop. Since, inception of crop, it is often referred as "gold mine" of wasteland and cashew has transformed into a critical source of livelihood for farmers (Bharat *et al.*, 2018).India holds the largest area under cashew cultivation, covering 21.6% of the global total and rank as the third-largest producer of raw cashew nuts, contributes 17.3% to the world's supply. The trend on exportscenario shows, India falls behind Vietnam, makes 34% of the global cashew kernel exports (Sajeev *et al.*, 2018). Also, it has emerged as one of the world's leading producer, consumer and exporter of cashew nuts, with its kernels being highly prized in over 60 countries for their superior quality and taste (Bhoomika and Rani, 2018). However, despite its dominant global presence, India's cashew productivity trails behind key competitors like Vietnam, Nigeriaand Ivory Coast mainly due to several pressing constraints. These include improper harvesting methods, inadequate drying processes, limited storage facilities and poor post-harvest infrastructure, which hinder the country's ability to maximize yields and quality (D'Silva and Bhat, 2021).

Among India’s leading cashew-producing states, Kerala and Tamil Nadu stand out as significant contributors to the nation’s cashew nutproduction. Tamil Nadu boasts a vast expanse of 167,000 hectares dedicated to cashew cultivation, yields approximately 73.60 thousand tonnes of cashew nuts annually. This large-scale production highlights Tamil Nadu's importance in the national cashew industry. In contrast, Keralawith a considerably smaller cultivation area of 103,200 hectares, produces 73.10 thousand tonnes of cashew nuts per year. Besides, 38% less land under cultivation, Kerala’s cashew productivity comes remarkably close to Tamil Nadu cashew production (GOI, 2024). This noticeable discrepancy in production output relative to land size between states underscores a significant variation in productivity. There are many factors that, could explain this differences such as distinct agricultural practices, levels of technological advancement and varying degrees of infrastructural support. The state of Kerala’s higher productivity per unit area may be attributed to more efficient cultivation techniques, superior management of resources, or better adaptation to local environmental conditions. Contradictorily, Tamil Nadu’s larger landholdings may face challenges in optimizing productivity due to potential constraints in infrastructure, labour and the management of agricultural inputs. The critical understanding of these differences is crucial for development of tailored strategies to address productivity gaps and boost overall cashew output in both regions.

Though the experienced constraints, ranging from climatic challenges, pest and disease infestations to limited access to modern agro-technologies and inadequate market facilities, whichaffect both states in varying degrees. Addressing these issues is critical not only for enhancing productivity, but also for improving the livelihoods of farmers and ensuring the sustainable growth of the cashew industry in both states. Therefore, understanding and comparing the specific constraints faced by cashew growers in Kerala and

Tamil Nadu is crucial to devise effective region-specific strategies for overcoming these challenges.

METHODOLOGY

The multi-stage purposive sampling process wasimplied to identify the two districts with highest cashew production*viz.*,Cuddalore district in Tamil Nadu and Kannur district in Kerala.Further, among the fourteen districts of Kerala, Kannur leads in cashew nut production covers an area of 19,264 hectares and yield potential constitutes 14,475 metric tonnes (GOK, 2023) makes an ideal focus for this study. According toseason and crop report of Government of Tamil Nadu 2021-22, Cuddalore produced 10,515 metric tonnes of cashew nut, established as the lead producer among the districts of Tamil Nadu, with a total area of 29,489 hectares (GOT, 2022). This wholesome selection process relied on secondary data from statistical reports publishedby both state governments and further validated through expert consultations. Also, insights gained from intense dialogues with field-level Agriculture Officers of Kerala and Horticulture Officersof Tamil Nadu provided valuable context on local cashew production scenario. Additionally, consultations with faculty members from Tamil Nadu Agricultural University (TNAU) and Kerala Agricultural University (KAU), along with scientists from the All India Coordinated Research Project (AICRP) on cashew in Kerala and officials from Regional Research Stations in Tamil Nadu, contributed to a broader perspective on cashew nut production. Furthermore, discussion with officials from State Horticultural Farm in Tamil Nadu enriched the intellect on indigenous system and cashew cultivation practices. Hence, these collective efforts were crucial in identification of best-performing development blocks in cashew cultivation and thereby establishes a solid foundation for this research.

In Kannur district of Kerala, 80 cashew growers were selected for the study, with 40 respondents from Iritty block and 40 respondents from Peravoor block. In Irittylocality, simple random sampling procedure was followed to select 20 samplefromKacherikadavu and Payam gram panchayat.Likewise, in Peravoor 20 cashew growers were selected from Kelakam and Kottiyoorgram panchayat. This methodological procedure ensured a representative sample from Kannur, paving a way for enabling a comprehensive analysis of regional cashew cultivation practices.

Similarly, in Cuddalore district of Tamil Nadu 80 cashew growers were selected with 40 from Panruti block and 40 from Kammapuram block. From each blocktwogrampanchayat were chosen purposively, *viz*., Alagappasamuthiram and Arasadikuppam from Panruti block, while in the Kammapuram block, Kotteri and Muthanai gram panchayat were selected, resulting in 20 cashew growers each. In total, cumulative sample size attained 160 through multi-stage sampling, provided a balanced dataset for the study.

Data were collected using a pre-tested, well-structured interview schedule crafted to comprehensively cover the constraints faced by cashew growers. The schedule was developed after a pilot study in non-sample area, that identified key challenges through discussions with farmers and experts. It includes a list of constraints, which respondents ranked based on their personal experiences, providing a nuanced understanding of how each issue affected their farm economy and cashew cultivation practices. This ranking system captured the subjective nature of the challenges, essential for targeted interventions. An open-ended question facilitated respondents to mention additional constraints not covered in the pre-defined list, ensuring a comprehensive collection of data. The gathered information was analysed using Statistical Package for Social Sciences (SPSS) to represent the frequency, percentage of each constraint and cumulative frequency to better understand their prioritization. These methods

strengthened the research findings, offering insights into the most critical issues affecting cashew farmers.

RESULTS AND DISCUSSION

The findings are presented as constraints in the Table 1, which includes frequency (f) and percent (%) based on the collected data, along with the assigned rank for each constraint. Below the table, each constraint is discussed in detail to provide a comprehensive understanding of the challenges faced by the respondents.

Table 1: Constraints faced by the cashew growers of Kerala and Tamil Nadu

Sl. No.	KERALA (n=80)				TAMIL NADU (n=80)			
	Constraints	**f**	**%**	**Rank**	**Constraints**	**f**	**%**	**Rank**
1.	Prevalent pest and disease infestations (CSRB)	80	100.00	I	Prevalent pest and disease infestations (CSRB)	80	100.00	I
2.	Limited labour availability	78	97.50	II	Low market pricefor the raw cashew kernel during procurement by local merchant / traders	79	98.75	II
3.	Low market price for raw cashew kernel during procurementby local merchant / traders	75	93.75	III	Seasonal changes and climate variability impacts cashew nut yield	75	93.75	III
4.	Monopoly market affecting pricing system	74	92.50	IV	High cost associated with labour and agricultural inputs	70	87.50	IV
5.	Highcost in hiring labour and farm machineries	73	91.25	V	Inadequate irrigation facilities	60	75.00	V
6.	Fluctuations in market price	65	81.25	VI	Lack of extension support from thegovernment machineries	58	72.50	VI
7.	Inferior qualityof inputsandgraft provided by state government	57	71.25	VII	Infestation by wild boar, deer and peacock	45	56.25	VII

8.	Lack of group cohesivenessamong growers	58	72.50	VIII	Unsuitability of hybrid varieties in rainfed-cultivation area	44	55.00	VIII
9.	Human-wildlife conflict caused by elephant, wild boar and leopard	49	61.25	IX	Dominance of agro-input dealers in fertiliser and pesticiderecommendations	35	43.75	IX
10.	Absence of minimum support price	40	50.00	X	Non-availability of infrastructure facilities for processing, drying and storage	28	35.00	X
11.	Insufficient government support during natural calamities	38	47.50	XI	Absence of crop-specific scheme	30	37.50	XI
12.	Devastating incidences of heavy windfall and landslides	30	37.50	XII	Lack of practically applicable training opportunities	22	27.50	XII
13.	Insufficient technical guidance from government	29	36.25	XIII	Monopoly market affecting pricing system	21	26.25	XIII
14.	Adulterationof cashew nuts by mixing inferior quality from different districts by local merchant/traders	25	31.25	XIV	Absence of value addition industries and product diversification mechanism	20	25.00	XIV
15.	Lack of small-scale industries for cashew processing units	24	30.00	XV	Insufficient preference or low price for local cashew yield due to high dependence on imported cashew kernel	19	23.75	XV
16.	Absence of developmental interventions from the Cashew Board	10	12.50	XVI	Wastage of cashew apple due to lack of processing facilities	18	22.50	XVI

From the table.1 it is clearly evident that in Kerala, the most critical issue faced by cashew growers was the prevalent pest and disease infestations especially the severe incidence of cashew stem and root borer (CSRB) affecting the yielding potential cashew trees and surpassing the economic threshold level (ETL) and economic injury level (EIL) as opined

by 100 per cent of respondents, which underscores the timely call for integrated pest and disease management interventions by research and developmental agencies. Limited labour availability emerged as a major constraint, with 97.50% of farmers reported difficulties in securing an adequate farm-workforce, particularly highlighting the challenges in labour management. Low market price for raw cashew kernels during procurement by local merchants and traders affected 93.75% of the respondents, with the lack of a stable pricing system exacerbating growers' financial vulnerability. Market monopoly was identified as a significant concern by 92.50% of thefarmers, indicates middlemen intervention and large traders' control over determination of price leads to reduction in bargaining power farmers. High labour cost was a significant concern for 91.25% of the growers, compounding the issue of limited labour availability and creating a situation where farmers had to pay more for the scarce labour force, which in turn increased their production cost. Market price fluctuation was reported by 81.25% of the respondents, resulting in unpredictability to farmers' income and long-term planning. Additionally, 71.25% of the respondents expressed concerns about inferior quality inputs andgrafts provided by the government machineries, which directly impacts productivity of the cashew. The absence of group cohesiveness among cashew growers, cited by 72.50% indicates a weakness in collective bargaining power, limiting access to better marketing opportunities and technical guidance. Human-wildlife conflict was a notable issue for 61.25% of farmers, particularly concerning elephant, wild boar and leopard, leading to severe crop damage. The absence of minimum support price was reported by 50% of respondents, further exacerbating financial uncertainty in the cashew farming sector and illustrating the need for governmental intervention to ensure price stability in plantation economy.Moreover, inadequacy of government support during natural calamities was noted by 47.50% of respondents, expressed the vulnerability of growers to environmental shocks.

Additionally, devastating incidences of heavy windfall and landslides were mentioned by 37.50% of farmers, underscores the follow-up by developmental agencies towards environmental challenges that significantly affects crop yield. Furthermore, insufficient technical guidance from the government, reported by 36.25% of respondents, highlights the outreach gap in the dissemination of critical information regarding good horticultural practices in cashew cultivation and management. This lack of support can hinder farmers' ability to adopt improved practices and recommended scientific technologies, ultimately affecting productivity. Adulteration bymeans of mixing of inferior quality cashew nuts from different districts by local merchants, cited by 31.25% of farmers, raises concerns about product quality deterioration and defaming the uniqueness of desi cashew, which adversely affect consumer trust and farmers' economic security.The lack of small-scale and cottage industries for kernel processing, mentioned by 30% of farmers, indicates the limited infrastructure facilities available for cashew nut processing within the local context. This absence restricts farmers' ability to convert raw cashew into higher-value products, further reinforcement of their reliance on merchants for raw sales and often resulting in lower profit margins.Finally, absence of developmental interventions from the Cashew Boardwas cited by 12.50% of respondents, suggesting a perceived lack of support from governing bodies in establishment ofcashew-basedindustry.

In Tamil Nadu, occurrence of pest and disease infestations specifically, CSRB found to be rigorousin study area, was reported as a critical issue by all (100%)the respondents, which isin line with Kerala context, highlights the pervasive nature of this constraint across the states. The most significant constraint identified by 98.75% of cashew growers was low market price for raw cashew kernel procured by merchants and traders, emphasising the urgent need for a proper regulated pricing system to protect farmers from middlemen

exploitation. Seasonal changes and climate variability were noted as paramount important factors impacts cashew tree yield potential, affecting approximately 93.75% of farmers, demonstrating the sensitivity of cashew cultivation towards climatic fluctuations and the necessity for climate-resilient horticultural practices. High costassociated with labour and agro-inputs were reported by 87.50% of respondents, representing a serious financial burden that impacts profitability and sustainability of cashew production. Inadequate irrigation facility was a constraint for 75% of farmers, indicates the need for improved water management strategies in semi-arid regions of Tamil Nadu. Additionally, 72.50% of the respondents expressed concerns about lack of extension support from the government machineries, denoting the need for better technical guidance to improve scientific cashew cultivation practices. Infestation by wild animals, includes wild boar, deer and peacock, was a notable issue for 56.25% of respondents, which not only leads to crop damage but also creates the economic yield loss. Moreover, 55% of the respondents mentioned hybrid of cashew were unsuitable for rainfed-cultivation areas due to lack of non-availability water for irrigation, highlighting the importance of development of adaptable varieties for local scenario. Furthermore, 43.75% of respondents indicated the dependency and influence of agro-input dealers due to monopolistic nature of agro-chemical private firms in recommendations for fertilisers and pesticides could adversely affect thepersonal farming decision of growers. Furthermore, 35% of respondents reported a lack of infrastructure facilities for processing, drying and storage, which limits post-harvest opportunities and leads to significant post-harvest losses thereby necessitating monetary investment in processing facilities to enhance market competitiveness and profitability.The absence of crop-specific schemes was reported by 37.50% of respondents, indicates gap in targeted government initiatives that could support cashew cultivation. Similarly, lack of practically applicable training opportunitieswas

highlighted by 27.50% of farmers, underscoring the need for hands-on technical guidance to improve farming practices and productivity. Monopoly marketing systemaffects price, cited by 26.25% of the respondents, suggests that farmers experiencing challenges in negotiating fair price, as large traders and middlemen dominate the local market. Additionally, absence of value addition industries, reported by 25.00%, limits farmers' ability to enhance the profitability of their produces through processing facilities. About 23.75% of respondents expressed concern over the insufficient preference or low price for local cashew yield due to the high dependence on import of cashew kernel from other countries namely Ivory coast, Vietnam and Ghana, etc,. which drives down the value of locally-produced cashews. Finally, wastage of cashew apple due to the lack of processing facilities was a constraint for 22.50% of the respondents, pin-points the missed opportunity to utilise cashew apples for value-added products and reduce product diversification of cashew.

CONCLUSION

This intriguing research exploration highlights the numerous constraints faced by cashew farmers in Kerala and Tamil Nadu, many of which severely limit their productivity, profitability and overall sustainability of cashew in national level. While certain constraints, such as incidence of pest and disease infestations, labour scarcity and fluctuating market prices, were ranked higher in frequency, other lower-ranked issues are equally critical. For instance, constraints like absence of crop-specific scheme, practically implacable training opportunities, and value addition industries, though identified by fewer farmers, reflect deeper systemic challenges. These issues were raised by the more experienced and knowledgeable farmers, indicates their significance to the long-term viability of the national level cashew industry. It is crucially important that, government, cashew development bodies and policy-makers recognize the importance of addressing these lower-ranked constraints but vital

concerns alongside the more prominent challenges. The need of the hour is to formulatecomprehensive cashew specific policy interventions to not only resolve immediate challenges but also to ensure that every constraint, whether frequently mentioned or identified by a few, is given equal attention at the longer run. These nuanced critical issues require focused strategies to enhance technical guidance, foster value addition, and create sustainable growth avenues for the cashew farming communities. Neglecting even the lesser-reported challenges, risks undermining the broader efforts to improve the livelihoods of cashew farmers and future of the cashew industry. Therefore, a holistic approach is essential for fostering resilience and ensuring the long-term success of cashew cultivation in India.

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