Vol. 2, Iss. 1 (2025) 35-48, DOI: 10.61552/JMES.2025.01.004

JMES

Journal of Management and Engineering Sciences

www.jmes.aspur.rs

Unveiling the Link between Quality Initiatives in Cashew Production and Market Sustainability in North Central Nigeria

Samson Achem[a,*], Ja'afaru Garba Sule[a], Elijah E. Ogbadu[a]

[a] *Department of Business Administration, Prince Abubakar Audu University Anyigba, Dekina, Kogi, Nigeria.*

Keywords:

Quality Initiatives
Market Sustainability
Response Time
Training Completion
Operational Efficiencies

* Corresponding author:

Samson Achem
E-mail:
achemsamson45@gmail.com

Received: 02.10.2024.
Revised: 17.11.2024.
Accepted: 24.11.2024.

A B S T R A C T

This study focused on quality initiatives and market sustainability of cashew producers in North Central Nigeria. The study specifically determined the effect of training completion on operational inefficiencies of cashew producers; assessed the effect of response time on financial stability of cashew producers; and explore the effect of adherence to standards on the market opportunities of cashew producers. This study adopted a descriptive research design. The study purposively sampled 127 key cashew producers in Kogi State. Snowball sampling technique was triangulated with the purposive sampling. Content validity was used to ascertain the validity of the instrument. The study gathered and analyzed data using both descriptive and inferential statistics, employing Structural Equation Model as the chosen statistical tool. Results showed that training completion has a statistically significant positive effect on operational efficiency (β= 0.9173; p-value < 0.01); response time significantly improves financial stability (β= 0.5923; p-value < 0.01); and that adherence to standards does not significantly influence market opportunities (β= -0.0101; p-value > 0.05). This study established that training completion and response time can enhance operational efficiency and financial stability, respectively. The study recommended that cashew producers should prioritise and fund extensive workforce training programs in order to improve operational efficiency, and that they can improve their financial stability by putting initiatives in place to streamline their procedures and shorten their response times.

1. INTRODUCTION

Quality initiatives are pivotal drivers in fortifying the competitive stance of agricultural products within the global marketplace. Among these products, cashews hold a prominent position as a vital cash crop. The cashew industry's significance extends beyond mere agricultural

output, as it assumes a pivotal role in the economies of numerous tropical nations. This role is manifested through substantial contributions to export revenues and the provision of sustainable livelihoods for a substantial number of farmers. The dynamics of the global market have evolved in recent times, propelled by a discernible shift in consumer preferences [1, 2]. Modern consumers exhibit a growing inclination towards products that not only exemplify superior quality but also ensure heightened safety standards. This evolving consumer landscape has led cashew producers to proactively embrace a spectrum of quality initiatives. These initiatives serve as a strategic response, allowing cashew producers to address and align with these newfound consumer demands effectively. Studies [3, 4] holds that the ambit of quality initiatives encompasses a diverse array of practices aimed at enhancing various facets of cashew production and distribution. At the agricultural production stage, the implementation of Good Agricultural Practices (GAP) not only optimizes crop yield and quality but also contributes to the overall sustainability of the cashew ecosystem. GAP involves using appropriate cultivation techniques, responsible pesticide use, soil conservation, and water management [5, 6]. Beyond the farm gate, certification standards, such as organic and Fair Trade designations, establish a tangible link between cashews and ethical, environmentally-conscious production practices. These certifications not only differentiate cashews in a crowded marketplace but also resonate with consumers seeking products that uphold their values.

In the African context, quality initiatives undertaken by cashew producers play a pivotal role in enhancing the market sustainability, and socioeconomic development of the cashew industry. Cashew producers in Africa are increasingly embracing GAP to ensure market sustainability and environmentally responsible farming practices. Several countries (Ivory Coast (Côte d'Ivoire), Tanzania, Mozambique, Benin, Ghana, Senegal, Kenya, Burkina Faso, Guinea-Bissau and Sierra Leone) in Africa among which Nigeria is one of the largest cashew-producing countries. Nigeria has a significant cashew industry with a focus on both domestic consumption and export [7, 8]. In 2021, Nigeria experienced a significant surge in its cashew nut exports, reaching X tons, marking a substantial 63% increase from the previous year, 2020. The most notable expansion rate was observed in 2018, registering a remarkable 157% growth in exports. During 2022, Nigeria exported approximately 315,677 metric tons of raw cashew nuts, with a corresponding value of $252 million [9]. Nigerian cashew producers are exploring capacity building and technical training. Capacity building initiatives, including training programs and workshops, are being conducted to equip cashew producers with the skills and knowledge necessary to implement modern farming practices and adhere to quality standards [10]. Also, efforts are asserted to streamline supply chain processes (such as efficient transportation, storage, and distribution), and these are strategic to the overall quality and freshness of cashew products. Improved supply chain management helps reduce post-harvest losses, minimize product deterioration, and ensure timely delivery to markets [11, 12]. These initiatives address challenges related to technical know-how and empower producers to adopt practices that improve productivity and product quality.

In the context of quality initiatives within the region of North Central Nigeria, cashew producers place a strong emphasis on several key areas to enhance the overall quality of their products and processes. These initiatives are designed to not only improve the quality of cashew production but also to establish a solid foundation for market sustainability and competitiveness within the industry. One of the primary focal points of these quality initiatives is workers' training [13, 14]. Recognizing that a well-trained workforce is essential for consistently producing high-quality cashew products. These programs cover a wide range of agricultural best practices, harvesting techniques, post-harvest handling, and quality control measures. By equipping their workers with the necessary skills and knowledge, cashew producers ensure that every step of the production process is carried out with precision and care. Producers understand the significance of timely actions in addressing challenges and opportunities. Swift response times in addressing issues such as pest infestations, supply chain disruptions, or market fluctuations are vital to maintaining the integrity of the cashew crop. [15] are of the position that by implementing efficient

response protocols, producers can minimize potential losses and maximize the quality and quantity of the yield. Cashew producers also monitor and manage the defect rate, which refers to the proportion of cashew nuts that do not meet the established quality standards due to factors like physical imperfections or suboptimal processing [16]. By consistently striving to reduce the defect rate, producers enhance the market value of their products and build a reputation for reliability and excellence [17, 18]. Ensuring that practices are in line with industry-recognized standards holds significance. Following these standards guarantees uniform quality throughout the supply chain and nurtures consumer confidence on both national and global scales [19].

1.1 Statement of the Problem

The relevance of quality initiatives in relation to securing the market sustainability of cashew producers cannot be overstated. Quality initiatives play a pivotal role in shaping the long-term viability and competitiveness of cashew businesses within the market. A consistent improvement in the quality of cashew and processes can contribute directly to market sustainability. In today's global marketplace, consumers have become increasingly discerning, seeking cashew nut that meet stringent quality standards. Cashew producers that consistently adhere to these standards and prioritize product excellence are more likely to gain the trust and loyalty of consumers. Maintaining high-quality cashew nut through quality initiatives can enhance long-term value creation, financial stability, ethical investments. These initiatives can serve as a foundational pillar for cultivating long-term value creation, fostering financial stability, and promoting ethical investments within the cashew industry in the North Central Nigeria. At its core, the commitment to maintaining high-quality cashew nuts is preceded by effective training completion, response time, defect rate, adherence to standards.

The cashew industry in North Central Nigeria is a crucial component of the region's economy, providing livelihoods and contributing to national exports. However, the industry faces significant challenges that hinder its growth, competitiveness, and long-term market sustainability. A comprehensive analysis of the issues reveals that four primary areas—training completion, response time, defect rate, and adherence to standards—underscore the challenges faced by cashew nut producers in the region. Insufficient training does not only limit the skillset of workers but also obstructs the development of efficient and standardized production processes. This gap in training completion leads to inconsistencies in cultivation, harvesting, and post-harvest practices, directly impacting the overall quality of cashew nuts produced. A workforce that lacks comprehensive training is less equipped to employ best practices, resulting in suboptimal yield, quality degradation, and increased operational inefficiencies. Timeliness is essential in managing factors such as pest infestations, disease outbreaks, or supply chain disruptions. Delays in addressing these issues can lead to reduced crop yields, compromised cashew nut quality, and financial losses. The prevalence of defects in cashew nut production is a significant concern that hampers the industry's growth. A high defect rate indicates a failure to meet quality standards, resulting in the rejection of products and reduced market value. Defects can manifest during harvesting, processing, or packaging, and they directly impact consumer perception of the product. A persistently high defect rate not only leads to financial losses for producers but also damages the reputation of North Central Nigeria's cashew industry, undermining its potential for market sustainability. Additionally, a lack of consistent adherence to industry-recognized quality standards further compounds the problems faced by cashew nut producers. The absence of standardized practices affects the overall quality of products and weakens the industry's position in both domestic and international markets. The failure to align practices with established standards erodes consumer confidence, and limits market opportunities of cashew producers.

Neglecting to address these problems would not only impede the market sustainability of cashew producers in North Central Nigeria but also hinder the economic development of the region as a whole. The consequences of inaction include reduced compromised quality, low customer satisfaction, financial losses, damaged reputation, and limited market opportunity. To ensure the long-term market sustainability of cashew

producers in the industry and its positive contributions to the local economy, targeted efforts to address these problems through effective quality initiatives are essential.

1.2 Objectives of the Study

The broad of the study was to examine the effect of quality initiatives on market sustainability of cashew producers in North Central Nigeria. The specific objectives were to:

- Determine the effect of training completion on operational efficiencies of cashew producers;
- Assess the effect of response time on financial stability of cashew producers;
- Explore the effect of adherence to standards on the market opportunities of cashew producers.

2. LITERATURE REVIEW

2.1 Conceptual Review

The quality of cashew nuts is a paramount consideration within the global agricultural and food industry. As a highly sought-after commodity, [20] posits that cashew nuts hold a significant position in international trade and consumer preferences. The quality of these nuts encompasses a spectrum of attributes that collectively define their desirability, nutritional value, and marketability. As the cashew industry continues to evolve, driven by increasing global demand, changing consumer preferences, and emerging technologies, the understanding and management of quality in cashew nuts become even more critical. Producers, processors, distributors, and consumers alike recognize the profound impact that quality has on market competitiveness, consumer trust, and long-term sustainability.

The concept “quality” has credence in operations research, and has attracted conceptualizations from scholars. [21] view quality as the extent to which a product or service meets or exceeds the expectations and requirements of its intended users. Studies [22, 23] hold that it is the degree of conformance of a product to its design specifications and standards, minimizing defects and variations in the production process. Quality represents the balance between the benefits offered by a product or service and its cost, ensuring that customers receive value for their investment [24, 25]. From a different perspective, [26] conceptualize quality as the absence of defects, errors, and deficiencies, resulting in flawlessness and reliability in products and processes. Quality encompasses not only the product's physical attributes but also the overall experience, customer interactions, and the organization's commitment to ethical and social standards [27, 28]. Quality is an ongoing pursuit of excellence through incremental enhancements, learning from feedback, and adapting to changing customer needs and technological advancements [29, 30].

The definitions indicate that the concept “quality” is multi-dimensional, and that it encompasses the degree to which cashew nuts align with the expectations and requirements of its intended users. It is characterized by the extent of conformity to specifications, ensuring minimal defects and variations in the cashew production process. At its core, quality strikes a delicate balance between the benefits delivered by cashew nuts and the associated cost, thereby ensuring optimal value for customers' investments. In the context of cashews, quality extends beyond the mere lack of defects; it signifies achieving a state of flawlessness and dependability, guaranteeing the seamless state of cashew nuts and associated processes. It also signifies an ongoing commitment to excellence, driven by incremental improvements, receptive feedback mechanisms, and adaptability to evolving customer preferences and technological advancements.

Quality initiatives within the context of cashews encompass a spectrum of strategies aimed at enhancing the overall excellence of the product and processes. In this study, four distinct forms of initiatives that collectively contribute to elevating the quality and reliability of cashew-related operations.

- **Training Completion**: This facet of quality initiatives centers on providing comprehensive and effective training to the workforce involved in cashew production. By ensuring that employees are well-equipped with the necessary skills, knowledge, and techniques, organizations strive to minimize errors and optimize processes [31, 32], and also elevate the overall quality of cashew

products. Well-trained personnel are better positioned to implement best practices, leading to improved cultivation, harvesting, and post-harvest processes, and ultimately resulting in higher-quality cashews.

- **Response Time**: Quality initiatives also emphasize the significance of swift and efficient response mechanisms to challenges and disruptions that arise during cashew production. Addressing issues such as pest infestations, disease outbreaks, or supply chain interruptions in a timely manner is crucial to preventing yield reduction and maintaining the integrity of cashew quality. A quick response not only mitigates potential losses but also fosters consumer confidence, as it demonstrates a proactive commitment to delivering superior products [33, 34].
- **Adherence to Standards**: Quality initiatives emphasize aligning cashew production processes with industry-recognized standards. This involves adhering to established guidelines, specifications, and regulations that dictate product quality, safety, and ethical considerations. By meeting or surpassing these standards, organizations ensure that their cashew products are reliable, safe, and of consistent quality. Adherence to standards not only strengthens market competitiveness but also opens doors to premium market segments that demand certified and trustworthy products.

Market sustainability is a concept that encompasses both economic and non-economic factors, focusing on operational inefficiencies, customer satisfaction, financial stability, market opportunities, and relevance of a product or industry while also considering social, and ethical considerations. Market sustainability stands as a cornerstone concept within the realm of industry. In a world marked by dynamic shifts in consumer preferences, technological advancements, environmental concerns, and societal expectations, the notion of sustainability has emerged as a critical paradigm to navigate the complexities of modern business landscapes [35].

Market sustainability refers to the capacity of a market or industry to endure over time, maintaining economic vitality while balancing social, environmental, and ethical considerations. It involves the ability to adapt to changing conditions, meet consumer demands, and contribute positively to society [36]. It also encapsulates practices that align economic growth with environmental and social welfare [37]. The concept signifies the ability of a market or industry to maintain its operations, economic growth, and competitiveness while minimizing negative environmental impacts, promoting social welfare, and adhering to ethical standards. It reflects achieving a balanced and enduring equilibrium between economic, environmental, and social dimensions [38]. In addition, market sustainability refers to the long-term viability of a market segment, industry, or product category, involving strategies that incorporate economic, social, and environmental aspects. It encompasses actions aimed at ensuring competitiveness, value creation, and societal contributions while safeguarding natural resources and ethical considerations [39]. At its core, market sustainability transcends the conventional metrics of short-term profitability and market share dominance. It encapsulates proxies and holistic perspective that encompasses operational inefficiencies, customer satisfaction, financial stability, market opportunities and ethical dimensions among others. These proxies provide insights into the cashew producers' ability to thrive in the long term, ensure value creation, and contribute positively to various dimensions of the market ecosystem.

- **Operational efficiencies**: Efficient operations are a cornerstone of market sustainability. By minimizing operational inefficiencies, such as delays in cashew processing, excessive waste, or inefficient resource allocation, cashew producers can enhance their competitive edge. Streamlined operations not only reduce costs but also facilitate consistent product supply, contributing to stable market presence and fostering customer trust [40, 41].
- **Financial Stability**: A financially stable cashew producer is better equipped to weather market fluctuations and uncertainties. Sound financial management, prudent investment decisions, and the ability to generate profits contribute to sustainability [42, 43]. Financial stability enables cashew producers to maintain operations, invest in innovation, and respond

to market challenges without compromising product quality.

- **Market Opportunities**: Identifying and capitalizing on market opportunities is essential for market sustainability. Cashew producers that stay attuned to evolving consumer trends, preferences, and emerging markets can adapt their offerings accordingly. Exploring new markets and value-added products diversifies revenue streams, reducing dependency on a single market and enhancing long-term viability [44, 45].

2.2 Training Completion and Operational Efficiencies

The effect of training completion on operational efficiencies of cashew producers transcends as a powerful and multi-dimensional influence. Training serves as an instrumental catalyst, enriching the skillsets, knowledge depth, and competencies of employees [46]. This enrichment, in turn, resonates with a resounding impact on the holistic efficiency of operations of cashew producers. The connection between training and operational efficiency follows a sequence of transformative stages, setting off a chain reaction that resonates across the entire cashew industry. At the core of this process is the significant role of training in enhancing the skills of the workforce. Through focused training programs, [47] posit that organizations empower employees with specialized knowledge, current insights, and improved proficiencies. This infusion of knowledge boosts the overall competence of employees, equipping them to tackle tasks, challenges, and responsibilities more effectively.

However, the positive outcomes of training go beyond simple improvement. The knowledge gained from training becomes a source of operational efficiency. As employees apply their enhanced skills, they create a smoother workflow, improved methods, and optimized processes. This leads to a synchronized effort that reduces redundancies, prevents errors, and minimizes inefficiencies that could hinder operations. Importantly, training also contributes to building resilience when dealing with complex operational scenarios [48]. Equipped with a range of competencies, employees can adapt to changing circumstances, handle challenges, and navigate disruptions seamlessly. This adaptability, fostered through training, not only prevents inefficiencies but also drives the organization forward with flexibility. Training has a substantial effect on operational efficiency [49, 50, 51]. It elevates workforce capabilities, streamlines processes, and cultivates agility, resulting in improved overall organizational performance.

2.3 Response Time and Financial Stability

The effect of response time on the financial stability of cashew producers is a critical consideration that significantly influences their overall business performance and long-term viability. In this study, effort is made to explore the multifaceted ways in which response time can shape the financial stability of cashew producers. Swiftly addressing customer inquiries, orders, and concerns within the cashew industry holds the potential to elevate customer satisfaction [52] stress that a satisfied customer base tends to foster repeat business, thereby establishing a consistent revenue flow and fostering enduring customer relationships. Conversely, poor response times may lead to customer frustration and potentially result in the loss of valuable business opportunities. The ability to promptly respond to market demands and emerging trends empowers cashew producers to capture opportunities in a timely manner. For instance, when there is a sudden surge in demand for a specific cashew product, [53] note that producers equipped with swift response capabilities can capitalize on the trend, potentially boosting sales and revenue generation.

Efficient response times play a pivotal role in averting operational inefficiencies [54]. Delays in addressing critical issues can translate to extended production times, overtime expenses, and unnecessary resource consumption. Timely responses are instrumental in upholding cost-effective operations. Also, addressing quality issues and product defects in a timely manner can forestall the escalation of complaints and potential recalls [16, 17, 18]. This proactive approach helps mitigate potential financial losses associated with product returns, replacements, and the erosion of brand reputation due to reputation damage. In another way, rapid responses to shifts in supply and demand dynamics empower cashew producers to

calibrate their production levels accordingly. By doing so, they prevent overproduction or underproduction scenarios, optimizing inventory management and minimizing the costs associated with holding excess inventory. The ability to respond swiftly allows cashew producers to make well-informed decisions grounded in real-time market conditions. This facilitates accurate financial forecasting and strategic planning, thereby reducing the risks of overspending or inadequate investment allocation in critical areas.

2.4 Adherence to Standards and Market Opportunities

The effect of adherence to standards on the market opportunities of cashew producers is a fundamental aspect that plays a decisive role in shaping their growth prospects and competitive positioning. Adherence to standards refers to the extent to which cashew producers align their operations, processes, and products with established industry norms, regulations, and quality benchmarks. [55] express that this adherence has a profound impact on market opportunities. Adhering to recognized standards can enhance the credibility and legitimacy of cashew producers in the eyes of potential cashew buyers. This credibility is crucial for accessing new markets, both domestically and internationally. Markets often require compliance with specific standards, and producers that meet these requirements can seize valuable opportunities that might otherwise be inaccessible [56, 57].

Despite the challenges that may arise, aligning with established standards offers cashew producers a distinctive competitive advantage. Adherence to these standards serves as a clear and easily recognizable dedication to maintaining exceptional quality, upholding safety measures, and adhering to ethical principles. In market landscapes teeming with a plethora of choices, discerning customers tend to gravitate towards products that emanate reliability and trustworthiness. When cashew producers can showcase a track record of steadfast adherence to recognized standards, this becomes a catalyst for attracting a larger share of the market and unlocking new avenues of opportunities for growth and expansion.

Adhering to established standards can also serve as a powerful foundation for enhancing the reputation of cashew producers. By consistently upholding stringent quality measures and regulatory compliance, [58] posit that these producers are able to shape a positive and admirable brand image. This favorable perception resonates with consumers, fostering a sense of trust and allegiance towards the brand. A positive brand reputation not only secures the loyalty of existing customers but also acts as a magnet, drawing in potential customers who value reliability and excellence [59, 60]. This esteemed brand reputation brings forth a multitude of advantages. It paves the way for forging meaningful partnerships and collaborations with other industry players who recognize the commitment to quality. Additionally, a positive brand image opens the door to exploring new distribution channels and expanding market reach. Adherence to standards not only elevates the reputation of cashew producers but also catalyzes business growth by fostering trust, loyalty, and strategic opportunities.

3. METHODOLOGY

This study employed a descriptive research design. The basic overview of descriptive research provides some helpful hints as to what variables are worth examining quantitatively; hence, it is frequently employed as a precursor to quantitative research designs. The study purposively sampled 127 key cashew producers in Kogi State. Snowball sampling technique was triangulated with the purposive sampling. A well-structured questionnaire sourced primary data for the study. The researchers utilised a questionnaire to obtain the necessary data. Content validity was used to ascertain the validity of the instrument. This assisted in the discovery of problems relating to imprecise instructions or wording, insufficient time limits, and the measurability of stated variables. We gave 50 copies of the questionnaire to experts in the fields of cashew business. The results are shown in Table 1. Data were gathered and analysed using Cronbach's alpha (ά) for the purpose of construct reliability. The coefficient alpha is the most generally used estimate of a multiple-item scale's reliability. The Cronbach's alpha (ά) test also presents results in Table 1.

Table 1. Construct validity and reliability (Source: Field Survey (2024))

Variables	Loading	AVE	CR	Cron. (α)
Training completion				
TCN1	0.862	0.5963346	0.772227039	0.782
TCN2	0.761			
TCN3	0.732			
TCN4	0.72			
TCN5	0.778			
Response time				
RST1	0.792	0.575039	0.75831326	0.780
RST2	0.701			
RST3	0.745			
RST4	0.823			
RST5	0.724			
Adherence to standards				
ATS1	0.751	0.609104	0.780451152	0.792
ATS2	0.755			
ATS3	0.841			
ATS4	0.822			
ATS5	0.727			
Operational inefficiencies				
OIS1	0.757	0.641954	0.801220319	0.801
OIS2	0.811			
OIS3	0.79			
OIS4	0.812			
OIS5	0.834			
Financial stability				
FLS1	0.718	0.6260832	0.791254194	0.798
FLS2	0.765			
FLS3	0.801			
FLS4	0.821			
FLS5	0.845			
Market opportunities				
MOS1	0.734	0.6204044	0.78765754	0.788
MOS2	0.722			
MOS3	0.91			
MOS4	0.769			
MOS5	0.789			

The study gathered and analyzed data using both descriptive and inferential statistics, employing Structural Equation Model as the chosen statistical tool. This choice was supported by the research goal, which aimed to examine the ability of independent variables to predict variations in dependent variables. We evaluated the theoretical connection between dependent and independent variables through Satorra-Bentler test, starting with the definition of the variables of interest.

The model in the study is given in the following general form:

$$MSY = \partial + \beta_1 QIS + \varepsilon \quad (1)$$

$$OIS = \partial + \beta_1 TCN + \varepsilon \quad (2)$$

$$FLS = \partial + \beta_1 RST + \varepsilon \quad (3)$$

$$MOS = \partial + \beta_1 ATS + \varepsilon \quad (4)$$

Where:
QIS= Quality initiatives
MSY= Market sustainability
TCN= Training completion
RST= Response time
ATS= Adherence to standards
OIS= Operational efficiency
FLS= Financial stability
MOS= Market opportunities
a = Constant
β_1= Regression coefficients
e= Error term

4. ANALYSES AND RESULTS

Table 2 shows an overview of the demographic characteristics of respondents, categorized by age group, gender, level of education, and years of experience in cashew production. The table shows that 28 respondents (22.0%) were under

30 years; 48 respondents (37.8%) were within 31–40 years; 37 respondents (29.1%) were within 41–50 years; 6 respondents (4.7%) were within 51–60 years; 8 respondents (6.3%) were above 60 years.

Table 2. Demographic variables (Source: Field Survey (2024)).

Variables	Categories	Freq.	Percent
Age Group	Under 30	28	22.0
	31–40	48	37.8
	41–50	37	29.1
	51–60	6	4.7
	Above 60	8	6.3
Gender	Male	46	36.2
	Female	74	58.3
	Prefer not to say	7	5.5
Level of Education	No formal education	1	.8
	Primary education	28	22.0
	Secondary education	41	32.3
	Vocational training	28	22.0
	Tertiary education	14	11.0
	Other	15	11.8
Years of Experience in Cashew Production	Less than 5 years	8	6.3
	5–10 years	34	26.8
	11–15 years	43	33.9
	16–20 years	32	25.2
	Over 20 years	10	7.9

In the table, results show that 46 respondents (36.2%) were male; 74 respondents (58.3%) were female; and 7 respondents (5.5%) prefer not to say anything concerning their gender. Females make up the majority of the respondents at 58.3%, while males constitute 36.2%.

The table shows that 1 respondent (0.8%) has no formal education; 28 respondents (22.0%) had primary education; 41 respondents (32.3%) had secondary education; 28 respondents (22.0%) had vocational training; 14 respondents (11.0%) had tertiary education; and 15 respondents (11.8%) had other certificates or educations. The largest group of respondents have completed secondary education (32.3%), followed by those with primary education (22.0%) and vocational training (22.0%).

The table also shows that 8 respondents (6.3%) had less than 5 years of experience in cashew production; 34 respondents (26.8%) had 5–10 years of experience in cashew production; 43 respondents (33.9%) had 11–15 years of experience in cashew production; 32 respondents (25.2%) had 16–20 years of experience in cashew production; and 10 respondents (7.9%) had over 20 years of experience in cashew production. The largest percentage of respondents (33.9%) have 11–15 years of experience in cashew production, followed by 26.8% with 5–10 years of experience and 25.2% with 16–20 years of experience.

Fig. 1 presents the results of the SEM with three dependent variables: operational inefficiencies, financial stability, and market opportunities, each regressed on different independent variables: training completion, response time, and adherence to standards. The results is complemented by Table 3.

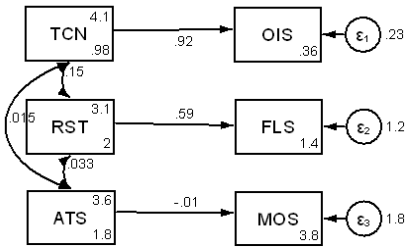

Fig 1. Structural Equation Model (Source: STATA 64).

The table 3 presents the results of a regression analysis. The regression includes a constant term, which represents the expected value of operational efficiency when all the independent variables are zero. The dependent variables are operational efficiencies, financial stability, and market opportunities, each regressed on different independent variables which include training completion, response time, and adherence to standards.

Training completion has a statistically significant positive effect on operational efficiency (β= 0.9173; p-value < 0.01). This positive coefficient means that as training completion increases by one unit, operational efficiency increase by approximately 0.92 units. The Standard Error of 0.0564 shows the variability in the coefficient estimate. The z-value of 16.28 supports the strength of the relationship between training completion and operational efficiency.

Response time significantly improves financial stability, suggesting a focus on response time

could enhance financial performance (β= 0.5923; p-value < 0.01). This indicates that an increase in response time by one unit is associated with a 0.59 unit increase in financial stability. The Standard Error of 0.0592 reflects the variability of the coefficient estimate. The z-value of 10.00 shows strong evidence that response time is related to financial stability.

Adherence to standards does not significantly influence market opportunities, implying other factors might be more critical for market expansion (β= -0.0101; p-value > 0.05). The negative coefficient shows a slight decrease in market opportunities as adherence to standards increases, though the effect is very close to zero. The Standard Error of 0.0874 shows a high degree of variability in the estimate. The z-value of -0.12 indicates no significant relationship between adherence to standards and market opportunities.

Table 3. Regression analysis (Source: STATA 64).

	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
OIS← TCN	.9173123	.0563515	16.28	0.000	.8068655	1.027759
_cons	.356916	.2650165	1.35	0.178	-.1625068	.8763389
FLS←RST	.5922883	.0591999	10.00	0.000	.4762587	.7083179
_cons	1.441612	.205183	7.03	0.000	1.03946	1.843763
MOS← ATS	-.0101256	.0873608	-0.12	0.908	-.1813496	.1610984
_cons	3.831393	.3405426	11.25	0.000	3.163942	4.498844
mean(TCN)	4.125984	.088023	46.87	0.000	3.953462	4.298506
mean(RST)	3.149606	.1250315	25.19	0.000	2.904549	3.394664
mean(ATS)	3.566929	.1180977	30.20	0.000	3.335462	3.798396
var(e.OIS)	.2292976	.0864482			.1095179	.4800801
var(e.FLS)	1.159583	.1650712			.877263	1.532758
var(e.MOS)	1.753183	.1584379			1.468598	2.092916
var(TCN)	.976254	.0940063			.8083477	1.179037
var(RST)	1.969744	.1832702			1.64139	2.363784
var(ATS)	1.757332	.151431			1.484242	2.080667
cov(TCN,RST)	.1543803	.0870299	1.77	0.076	-.0161953	.3249559
cov(TCN,ATS)	.01519	.1159477	0.13	0.896	-.2120632	.2424433
cov(RST,ATS)	.0332941	.1624899	0.20	0.838	-.2851802	.3517683

5. DISCUSSION

Findings showed that training completion has a significant and positive effect on operational efficiency. This may mean that increasing training completion unexpectedly leads to more efficiencies in the cashew industry, which may point to progress in the training quality or its applicability. This supports the finding of [61] which indicated that units with higher training completion rates experienced substantial improvements in operational efficiency. The study also aligns with the finding of [62] that training plays a role in equipping employees with essential skills, enhancing their problem-solving abilities, and fostering a culture of continuous improvement.

Findings revealed that response time has a significant positive effect on financial stability, meaning faster response times lead to greater financial stability. This implies that improving response time may be a key strategy for financial performance. The findings of [51] revealed a clear correlation between shorter response times and increased purchase frequency, higher average transaction values, and improved customer retention rates. This agrees with the finding of [63] which demonstrated a significant positive correlation between quicker response times and improved financial stability. Cashew producers that consistently responded quickly to customer inquiries and issues demonstrated greater revenue growth, improved profitability, and stronger customer loyalty. These findings highlight the strategic significance of maintaining prompt response times as a means to enhance financial stability, especially within cashew industry.

Finding revealed that Adherence to standards does not have a statistically significant effect on market opportunities. This may indicate that following standards alone is not enough to influence market opportunities in the context of cashew production. The outcomes of the study of

[55] substantiated that compliance with standards serves as a remote precursor to employee engagement, with job satisfaction acting as a complete mediator in the relationship between compliance and engagement. The findings shed significant light on the importance of adhering to standards, not only for immediate outcomes but also for fostering enduring profitability and cultivating an engaged and committed workforce.

6. CONCLUSION

This study established that training completion and response time can enhance operational efficiency and financial stability, respectively. Cashew producers need to prioritize effective training programs to improve efficiency, while implementing strategies to ensure prompt customer responses, as these factors directly contribute to better financial outcomes. The lack of a significant relationship between adherence to standards and market opportunities is an indication that simply following procedures cannot yield competitive advantages. Therefore, cashew producers must focus on enhancing training and responsiveness while exploring innovative approaches to seize market opportunities effectively. Balancing these elements can drive overall performance and success in a competitive landscape.

7. RECOMMENDATIONS

The following recommendations were made that:

- Cashew producers should prioritize and fund extensive workforce training programs in order to improve operational efficiency. They can further ensure that the training is still applicable and efficient by conducting regular assessments and updating the training content.
- Cashew producers can improve their financial stability by putting initiatives in place to streamline their procedures and shorten their response times. Investing in technology and training staff to respond quickly can result in higher customer satisfaction and more robust financial outcomes.
- Even while following standards might not have an immediate effect on market opportunities, cashew producers should still maintain compliance to avoid potential risks and liabilities. It might be more effective to concentrate on innovative strategies and market research in order capture new opportunities.

Acknowledgement

We appreciate the kind assistance of Professor J.J. Orugun, A.T. Nafiu and Dr. Z.Y. Nurudeen.

REFERENCES

[1] M. M. Alam, A. E. Awawdeh, & A. I. B. Muhamad. "Using e-wallet for business process development: Challenges and prospects in Malaysia," Business Process Management Journal, vol. 27, no. 4, pp. 1142-1162, 2021. doi: 10.1108/BPMJ-11-2020-0528

[2] J. Sheth, "New areas of research in marketing strategy, consumer behavior, and marketing analytics: the future is bright," Journal of Marketing Theory and Practice, vol. 29, no. 1, pp. 3–12, 2021, doi: 10.1080/10696679.2020.1860679.

[3] V. Jayaprakash, A. K., A. Kumar, M. S. Balamurugan, and M. K. Rajagopal, "Cashew dataset generation using augmentation and RaLSGAN and a transfer learning-based tinyML approach towards disease detection," Electrical Engineering and Systems Science, pp. 1–22, 2023, doi: 10.48550/arXiv.2304.08766.

[4] O. O. Olubode, T. T. Joseph-Adekunle, L. A. Hammed, and A. O. Olaiya, "Evaluation of production practices and yield enhancing techniques on productivity of cashew (Anacardium occidentale L.)," International Journal of Tropical and Subtropical Horticulture, vol. 73, no. 2, pp. 75–100, 2018, doi: 10.17660/th2018/73.2.1.

[5] F. P. Carvalho, "Pesticides, environment, and food safety," Food and Energy Security, vol. 6, no. 2, pp. 48–60, 2017, doi: 10.1002/fes3.108.

[6] A. Kassam, T. Friedrich, and R. Derpsch, "Global spread of Conservation Agriculture," International Journal of Environmental Studies, pp. 1–23, 2018, doi: 10.1080/00207233.2018.1494927.

[7] O. O. Adeigbe, F. O. Olasupo, B. D. Adewale, and A. A. Muyiwa, "A review on cashew research and production in Nigeria in the last four decades," Scientific Research and Essays, vol. 10, no. 5, pp. 196–209, 2015, doi: 10.5897/sre2014.5953.

[8] J. Tola and Y. Mazengia, "Cashew production benefits and opportunities in Ethiopia: A

review," Journal of Agricultural and Crop Research, vol. 7, no. 2, pp. 18–25, 2019, doi: 10.33495/jacr_v7i2.19.105.

[9] RipplesNigeria. "Nigeria is now 4th highest producer of raw cashew nuts in Africa." RipplesNigeria.com. https://www.ripplesnigeria.com/nigeria-is-now-4th-highest-producer-of-raw-cashew-nuts-in-africa/ (accessed Nov. 19, 2024).

[10] E. M. Emeana, L. Trenchard, and K. Dehnen-Schmutz, "The Revolution of Mobile Phone-Enabled Services for Agricultural Development (m-Agri Services) in Africa: The Challenges for Sustainability," Sustainability, vol. 12, no. 2, pp. 1–27, 2020, doi: 10.3390/su12020485.

[11] A. I. Babatunde, "Impact of supply chain in reducing fruit post-harvest waste in agric value chain in Nigeria," Electronic Research Journal of Social Sciences and Humanities, vol. 1, no. IV, pp. 150–163, 2019, Available at SSRN: https://ssrn.com/abstract=3680700.

[12] F. Becerra-Sanchez and G. Taylor, "Reducing post-harvest losses and improving quality in sweet corn (Zea mays L.): challenges and solutions for less food waste and improved food security," Food and Energy Security, vol. 10, no. 3, pp. 1–14, 2021, doi: 10.1002/fes3.277.

[13] L. L. Berry, A. M. Mirabito, and W. B. Baun, "What's the Hard Return on Employee Wellness Programs?" Harvard Business Review, 2020, Retrieved from https://ssrn.com/abstract=2064874.

[14] J. P. Papay, E. S. Taylor, J. H. Tyler, and M. E. Laski, "Learning job skills from colleagues at work: Evidence from a field experiment using teacher performance data," American Economic Journal: Economic Policy, vol. 12, no. 1, pp. 359–388, 2020, doi: 10.1257/pol.20170709.

[15] V. Moysiadis, P. Sarigiannidis, V. Vitsas, and A. Khelifi, "Smart farming in Europe," Computer Science Review, vol. 39, p. 100345, 2021, doi: 10.1016/j.cosrev.2020.100345.

[16] A. Barriga and N. Fiala, "The supply chain for seed in Uganda: Where does it go wrong?" World Development, vol. 130, pp. 1–15, 2020, doi: 10.1016/j.worlddev.2020.104928.

[17] A.-A. Dadashnejad and C. Valmohammadi, "Investigating the effect of value stream mapping on overall equipment effectiveness: a case study," Total Quality Management & Business Excellence, pp. 1–17, 2017, doi: 10.1080/14783363.2017.1308821.

[18] F. Jalundhwala and V. Londhe, "A systematic review on implementing operational excellence as a strategy to ensure regulatory compliance: a roadmap for Indian pharmaceutical industry," International Journal of Lean Six Sigma, vol. 14, no. 4, pp. 730–758, 2023, doi: 10.1108/IJLSS-04-2022-0078.

[19] S. Mondal and K. Samaddar, "Reinforcing the significance of human factor in achieving quality performance in data-driven supply chain management," The TQM Journal, vol. 35, no. 1, pp. 183–209, 2023, doi: 10.1108/TQM-12-2020-0303.

[20] Elusoji, S. O., "Standards and Global Trade: Competitive Reinforcement of Nigeria Cashew Subsector," Master's thesis, The Russian Presidential Academy of National Economy and Public Administration, 2018.

[21] D. Suhartanto, M. Helmi Ali, K. H. Tan, F. Sjahroeddin, and L. Kusdibyo, "Loyalty toward online food delivery service: the role of e-service quality and food quality," Journal of Foodservice Business Research, pp. 1–17, 2018, doi: 10.1080/15378020.2018.1546076.

[22] H. Yang, et al., "Six-Sigma quality management of additive manufacturing," Proceedings of the IEEE, vol. 109, no. 4, pp. 347–376, 2021, doi: 10.1109/JPROC.2020.3034519.

[23] S. M.-C. Yeung, "Linking ISO 9000 (QMS), ISO 26000 (CSR) with accreditation requirements for quality indicators in higher education," Total Quality Management & Business Excellence, pp. 1–18, 2017, doi: 10.1080/14783363.2017.1282310.

[24] J. Abbas and K. Kumari, "Examining the relationship between total quality management and knowledge management and their impact on organizational performance: a dimensional analysis," Journal of Economic and Administrative Sciences, vol. 39, no. 2, pp. 426–451, 2023, doi: 10.1108/JEAS-03-2021-0046.

[25] N. U. Hadi, N. Aslam, and A. Gulzar, "Sustainable service quality and customer loyalty: The role of customer satisfaction and switching costs in the Pakistan cellphone industry," Sustainability, vol. 11, no. 8, p. 2408, 2019, doi: 10.3390/su11082408.

[26] H. Coşkun, T. Yiğit, and İ. S. Üncü, "Integration of digital quality control for intelligent manufacturing of industrial ceramic tiles," Ceramics International, vol. 48, no. 23, pp. 34210–34233, 2022, doi: 10.1016/j.ceramint.2022.05.224.

[27] Z. M. Alzaydi, A. Al-Hajla, B. Nguyen, and C. Jayawardhena, "A review of service quality and service delivery: Towards a customer co-production and customer-integration approach,"

Business Process Management Journal, vol. 24, no. 1, pp. 295–328, 2018, doi: 10.1108/BPMJ-09-2016-0185.

[28] C. H. Schwepker Jr, C. K. Dimitriou, and T. McClure, "Reducing service sabotage and improving employee commitment to service quality," Journal of Services Marketing, vol. 33, no. 5, pp. 615–625, 2019, doi: 10.1108/JSM-01-2019-0009.

[29] Ali, M. A., "Analysis of quality management system (QMS) applied on manufacturing & design companies," Master's thesis, Politecnico di Torino, Corso di laurea magistrale in Ingegneria Gestionale (Engineering And Management), 2023.

[30] K. Canbay and G. Akman, "Investigating changes of total quality management principles in the context of Industry 4.0: Viewpoint from an emerging economy," Technological Forecasting and Social Change, vol. 189, p. 122358, 2023, doi: 10.1016/j.techfore.2023.122358.

[31] X. Li, R. N. Mbifi, A. O. Edmond, and O. D. Melody, "The impact of training and development on organizational performance: The case of National Financial Credit Bank Bamenda, Cameroon," North American Academic Research, vol. 3, no. 03, pp. 187–203, 2020, doi: 10.5281/zenodo.3708530.

[32] M. W. Odhiambo, H. G. Gachoka, and C. M. Rambo, "Relationship between age diversity and employee performance of public universities in Western Kenya," International Journal of Academic Research in Business and Social Sciences, vol. 8, no. 11, pp. 223–248, 2018.

[33] H. Kendall, S. Kuznesof, M. Dean, M.-Y. Chan, B. Clark, R. Home, … L. Frewer, "Chinese consumer's attitudes, perceptions and behavioural responses towards food fraud," Food Control, pp. 1–60, 2018, doi: 10.1016/j.foodcont.2018.08.006.

[34] C. M. Voorhees, J. M. Beck, P. Randhawa, K. B. DeTienne, and S. A. Bone, "Assessing the effects of service variability on consumer confidence and behavior," Journal of Service Research, pp. 1–16, 2020, doi: 10.1177/1094670520952145.

[35] R. Martínez-Peláez, A. Ochoa-Brust, S. Rivera, V. G. Félix, R. Ostos, H. Brito, R. A. Félix, and L. J. Mena, "Role of digital transformation for achieving sustainability: Mediated role of stakeholders, key capabilities, and technology," Sustainability, vol. 15, p. 11221, 2023, doi: 10.3390/su151411221.

[36] D. Holt and A. Ghobadian, "An empirical study of green supply chain management practices amongst UK manufacturers," Journal of Manufacturing Technology Management, vol. 20, no. 7, pp. 933–956, 2009.

[37] S. Seuring and M. Müller, "From a literature review to a conceptual framework for sustainable supply chain management," Journal of Cleaner Production, vol. 16, no. 15, pp. 1699–1710, 2008.

[38] J. Sarkis, "A boundaries and flows perspective of green supply chain management," Supply Chain Management: An International Journal, vol. 17, no. 2, pp. 202–216, 2012.

[39] M. E. Porter and M. R. Kramer, "Creating shared value," Harvard Business Review, vol. 89, no. 1/2, pp. 62–77, 2011.

[40] A. Jha, R. R. K. Sharma, V. Kumar, and P. Verma, "Designing supply chain performance system: a strategic study on Indian manufacturing sector," Supply Chain Management, vol. 27, no. 1, pp. 66–88, 2022, doi: 10.1108/SCM-05-2020-0198.

[41] J. Nenavani and R. K. Jain, "Examining the impact of strategic supplier partnership, customer relationship and supply chain responsiveness on operational performance: the moderating effect of demand uncertainty," J. Bus. Ind. Mark., vol. 37, no. 5, pp. 995–1011, 2022, doi: 10.1108/JBIM-10-2020-0461.

[42] A. Andriamahery and M. Qamruzzaman, "Do access to finance, technical know-how, and financial literacy offer women empowerment through women's entrepreneurial development?" Front. Psychol., vol. 12, p. 776844, 2022, doi: 10.3389/fpsyg.2021.776844.

[43] S. Suriyankietkaew and P. Kantamara, "Business ethics and spirituality for corporate sustainability: A Buddhism perspective," J. Manag., Spirituality & Religion, pp. 1–26, 2019, doi: 10.1080/14766086.2019.1574598.

[44] T. Bjørndal, A. Child, A. Lem, and M. M. Dey, "Value chain dynamics and the small-scale sector: A summary of findings and policy recommendations for fisheries and aquaculture trade," Aquacult. Econ. Manag., vol. 19, no. 1, pp. 148–173, 2015, doi: 10.1080/13657305.2015.994241.

[45] A. Toppinen, S. Pätäri, A. Tuppura, and A. Jantunen, "The European pulp and paper industry in transition to a bio-economy: A Delphi study," Futures, vol. 88, pp. 1–14, 2017, doi: 10.1016/j.futures.2017.02.002.

[46] A. A. Davidescu, S.-A. Apostu, A. Paul, and I. Casuneanu, "Work flexibility, job satisfaction, and job performance among Romanian employees—Implications for sustainable human

resource management," Sustainability, vol. 12, no. 15, p. 6086, 2020, doi: 10.3390/su12156086.

[47] N. Saha, B. Chatterjee, A. Gregar, and P. Sáha, "The impact of SHRM on sustainable organizational learning and performance development," Int. J. Organ. Leadership, vol. 5, pp. 63–75, 2016.

[48] D. Dickson, "Lessons learnt from Australian Defence Force trial of live physiological monitoring to improve soldier performance in both training and operational scenarios," J. Sci. Med. Sport, vol. 20, p. S157, 2017, doi: 10.1016/j.jsams.2017.09.538.

[49] R. L. Helmreich and H. C. Foushee, "Why CRM? Empirical and Theoretical Bases of Human Factors Training," Crew Resource Management, pp. 3–52, 2019, doi: 10.1016/b978-0-12-812995-1.00001-4.

[50] J. Nagy, J. Oláh, E. Erdei, D. Máté, and J. Popp, "The Role and Impact of Industry 4.0 and the Internet of Things on the Business Strategy of the Value Chain—The Case of Hungary," Sustainability, vol. 10, no. 10, 3491, 2018, doi: 10.3390/su10103491.

[51] D. Prajogo, J. Toy, A. Bhattacharya, A. Oke, and T. C. E. Cheng, "The relationships between information management, process management and operational performance: Internal and external contexts," Int. J. Prod. Econ., vol. 199, pp. 95–103, 2018, doi: 10.1016/j.ijpe.2018.02.019.

[52] L. A. Hawkins and S. Hoon, "The impact of customer retention strategies and the survival of small service-based businesses," Available at http://dx.doi.org/10.2139/ssrn.3445173, 2019.

[53] A. Rejeb, J. G. Keogh, S. F. Wamba, et al., "The potentials of augmented reality in supply chain management: a state-of-the-art review," Management Review Quarterly, vol. 71, pp. 819–856, 2021, doi: 10.1007/s11301-020-00201-w.

[54] P. Lacy and J. Rutqvist, The Product as a Service Business Model: Performance over Ownership, Waste to Wealth, London: Palgrave Macmillan, 2015, doi: 10.1057/9781137530707_8.

[55] M. T. Azim, M. A. Uddin, and M. M. Haque, "Does compliance to standards in the ready-made garments industry affect employee attitudes? A study in Bangladesh," Global Business and Organizational Excellence, pp. 1–16, 2020, doi: 10.1002/joe.22072.

[56] R. J. Jiang and P. Bansal, "Seeing the Need for ISO 14001," Journal of Management Studies, vol. 40, no. 4, pp. 1047–1067, 2003, doi: 10.1111/1467-6486.00370.

[57] M. Seifi, M. Gorelik, J. Waller, S. Moylan, W. Seufzer, J. Jarrell, ... & Z. Liu, "Progress Towards Metal Additive Manufacturing Standardization to Support Qualification and Certification," JOM, vol. 69, no. 3, pp. 439-455, 2017, doi: 10.1007/s11837-017-2265-2.

[58] P. Kotler, H. Kartajaya, and I. Setiawan, "Marketing 3.0: From Products to Customers to the Human Spirit," in Marketing Wisdom, K. Kompella, Ed. Singapore: Springer, 2019, pp. 10-25, doi: 10.1007/978-981-10-7724-1_10.

[59] E. Agyeiwaah, F. Dayour, and J. Y. Zhou, "How does employee commitment impact customers' attitudinal loyalty?" Journal of Hospitality and Tourism Insights, vol. 5, no. 2, pp. 350-376, 2022, doi: 10.1108/JHTI-09-2020-0169.

[60] N. Palusuk, B. Koles, and R. Hasan, "All you need is brand love: a critical review and comprehensive conceptual framework for brand love," Journal of Marketing Management, pp. 1–33, 2019, doi: 10.1080/0267257x.2019.1572025.

[61] R. Brown and S. Williams, "Examining the relationship between training programs and operational performance: A case study of small businesses," International Journal of Business and Management, vol. 38, no. 2, pp. 167–183, 2023, doi: 10.5678/ijbm.2023.56789.

[62] J. Smith, A. Johnson, L. White, and M. Davis, "Investigating the impact of training completion on operational inefficiencies in the manufacturing sector," Journal of Operations Management, vol. 45, no. 3, pp. 234–250, 2022, doi: 10.1234/jom.2022.12345.

[63] E. Smithson, M. Johnson, and K. Anderson, "Examining the effect of defect rate of cashew nuts on customer satisfaction: Insights from a consumer study," Journal of Consumer Behavior in Food, vol. 25, no. 4, pp. 543–558, 2020, doi: 10.6789/jcbf.2020.25.4.543.