



ANALYSIS OF VALUE ADDITION AMONG CASHEW NUTS PRODUCERS IN OYO STATE, NIGERIA

ADELEKE, A. O. ¹ | OKUNOLA, S. O. ² | OLARINDE, L. O. ³ | BINUOMOTE, S. O. ⁴

¹ DEPARTMENT OF AGRICULTURAL ECONOMICS, LADOKE AKINTOLA UNIVERSITY OF TECHNOLOGY, OGBOMOSO, NIGERIA.

² DEPARTMENT OF AGRICULTURAL ECONOMICS, LADOKE AKINTOLA UNIVERSITY OF TECHNOLOGY, OGBOMOSO, NIGERIA.

³ DEPARTMENT OF AGRICULTURAL ECONOMICS, LADOKE AKINTOLA UNIVERSITY OF TECHNOLOGY, OGBOMOSO, NIGERIA.

⁴ DEPARTMENT OF AGRICULTURAL ECONOMICS, LADOKE AKINTOLA UNIVERSITY OF TECHNOLOGY, OGBOMOSO, NIGERIA.

ABSTRACT:

Presently in Nigeria, products of the cashew tree (kernel and apple) are under-utilized for income generation. This study therefore analyzes value addition among cashew nuts producers in Oyo State, Nigeria. Multistage sampling technique was used to select 229 cashew farmers. A Double-Log Regression Model and One-Way Analysis of Variance (ANOVA) were used to analyse the data. The study revealed that in 2019 production season, the result showed that the coefficient of gender, farm size, and years of experience to be positive and statistically significant while credit access of the producers show negative coefficient and significant at 5% level of confidence. The coefficient of gender was significant at 1% level of confidence, this indicated that there will be increased cashew nut value addition among the producers with more male cashew producers. Also, the coefficient of farm size was significant at 1%, an indication that an increasing farm size will increase cashew value addition among the producers in the study area, ceteri paribus. Additionally, the result for the year 2020 showed improvement over the previous year. About 9 variables were significant in this year with various levels of significance. The coefficient of sex, farm size and years of experience were all positive and significant at 1% level of significance. Both age and educational status of the producers also influence value addition of the producers in the same year. The coefficients of these variables were significant at 5% level. Also, the coefficient of cost of labour was negative but significant at 10% level and both market outlet and processing facilities were positive and also significant at 10% level. The positive coefficient of other variables signifies that increase in these variables will lead to increase in value addition of cashew nut producer. The result in the year 2021 revealed that increase in age of the respondents will lead to decrease in value addition of cashew nut producers in the study area. The result stands due to the fact that the respondents were becoming aged and this accounted for less agility and productivity. Conversely, the coefficient of farm size showed positive relationship with value addition in the study area. Additionally, the result showed that both contract farming and storage facility increases value addition in the study area. The result as presented here showed that a unit increase in contract farmers enhances value addition of cashew producers by 0.3438 in 2021. It was concluded that in 2019, cashew nut producers will have increase output as much as they are educated. With increase in cost of labour in the year 2020 production season, most cashew nut producer have over utilized labour and additional cost on labour will negatively affect their expected value addition. The more the cashew nut contract farmers in the study area the more the value addition in 2021. Therefore, cashew producers should be educated. They should also optimize the cost of labour. More contract farmers should be involved in cashew production.

KEYWORDS:

CASHEW, COST OF LABOUR, EDUCATION, PRODUCER AND VALUE CHAIN

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1. INTRODUCTION

Cashew (*Anacardium occidentale* L.) originated from Brazil in South America. It is commonly grown in tropical countries of Africa; Nigeria inclusive. It is a broad leaved

evergreen tree crop that thrives well in poor soils and dry sandy locations. There are tonnes of write-ups and studies about Nigeria's agricultural misadventure. However, we

can bring some focus to a segment which can be regarded as a low hanging fruit in the Agricultural sector – Cashew. Nigeria is one of the largest producers of Cashew in the World. Furthermore, the International Nut and Dried Fruit Council in 2014 valued the global cashew market a whopping \$4.69 billion (Salau *et al.*, 2017). It is difficult to assess the production volumes across the various producing nations but the Food and Agriculture Organisation (FAO) estimates that the production of raw cashew nuts (RCN) has grown from 0.29 million tons in 1961 to 2.60 million tons in 2013 and West Africa's share of the market has tripled in the past decade (SBMORGEN, 2016). Cashew grows almost everywhere in Nigeria but it is concentrated primarily across the three southern geopolitical zones as well as the middle belt. The major producing Nigerian states are Benue, Kogi, Kwara, Oyo, Enugu, Abia, Anambra, Ekiti and Imo. The National Cashew Association of Nigeria (NCAN) reports that Nigeria earned US\$ 402Mn (N144.7bn) from the export of raw cashew nuts to Vietnam and other countries in 2017. In addition, National Bureau of Statistics (NBS, 2017) reports that cashew exports increased by 463 percent from N2.4bn in quarter one of 2017 to N13.5bn in quarter two of 2017 on a quarter - on-quarter basis. The production of cashew can solve economic, social and environmental problems in Nigeria.

Cashew contributed less than 2 percent to total agricultural exports in quarter one but contributed 45.4 percent to the sectoral export in the quarter two and 8.2 percent of total non-exports. The value makes the product the seventh largest export product in quarter two of 2017. Price per tonne of cashew nuts was put at US\$1,800 and Price per tonne of processed cashew was put at about US\$12,000.

The plurality of stakeholders in different segments involved in the cashew value chain could bring many benefits to the actors or stakeholder involved in the chain. Some of these like the processors and producers are organized into formal structures such as producers' and processors' associations (Agroforestry Network, 2018). Others like the aggregators and agents operate under informal arrangements. The need for coordination is therefore critical to ensure orderliness in the value chain. High-value products from agroforestry parkland trees provide opportunities for improved and diversified livelihoods, on the other hand. This is highlighted by the increasing global demand for raw cashew nuts (Mbow *et al.*, 2019). Value addition has been found to improve

income and shelf-life of product on crops like cashew (Aremu-Dele *et al.*, 2021). This study analyze of value addition among cashew nuts producers.

Presently in Nigeria, products of the cashew tree (kernel and apple) are under-utilised for income generation (Aremu-Dele *et al.*, 2021). There is still much wastage of the fresh apples on farms since a negligible portion is consumed by the harvesters. This wastage reduces the household income. It is, thus, imperative that value addition to cashew apple and nut be explored (ACI, 2021).

OBJECTIVE:

- analyze the factors influencing the value addition among cashew producers in the study area

HYPOTHESIS OF THE STUDY:

H₀: There is no significant difference in value addition to cashew nut among cashew producers in the study area

2. RESEARCH METHODOLOGY

The study was carried out in Oyo State, Nigeria, which is one of the six states in Southwestern Nigeria, and its capital is Ibadan. The state has a total land size of 28,454 square kilometers between 701'32.74" - 9011'7.81" N latitudes and 2039'59" - 4034'14.79" E longitudes. According to NBS (2016), Oyo State's estimated population is 7.8 million residents. Geographically, the state shares a border with Ogun State in the South; in the north with Kwara State; in the east with Osun State; and the west with Ogun State and partly the Republic of Benin. Oyo State has 33 Local Government Areas. Oyo state is purposively selected based on its active production of cashew in order of importance in Southwestern states of Nigeria (Akanni *et al.*, 2011; Ezeagu, 2002). Of the Southwestern states, according to Chemonics (2002), Oyo State has the largest hectareage under cultivation compared with Ekiti, Osun, Ondo and Ogun States. Oyo State gives a good representative of three main ecological zones (i.e the rainforest, guinea and derived savannah) found in the Southwestern States of Nigeria. The state is known for intensive agricultural activities, as most inhabitants engage in agriculture as the main source of livelihood. The climate in the state favours the cultivation of crops like maize, yam, cassava, millet, rice, plantains, cocoa, palm produce, cashew, and so on. There are four (4) Agricultural Development Programme zones in Oyo State: Ibadan/Ibarapa, Oyo, Ogbomosho, and Saki ADP.

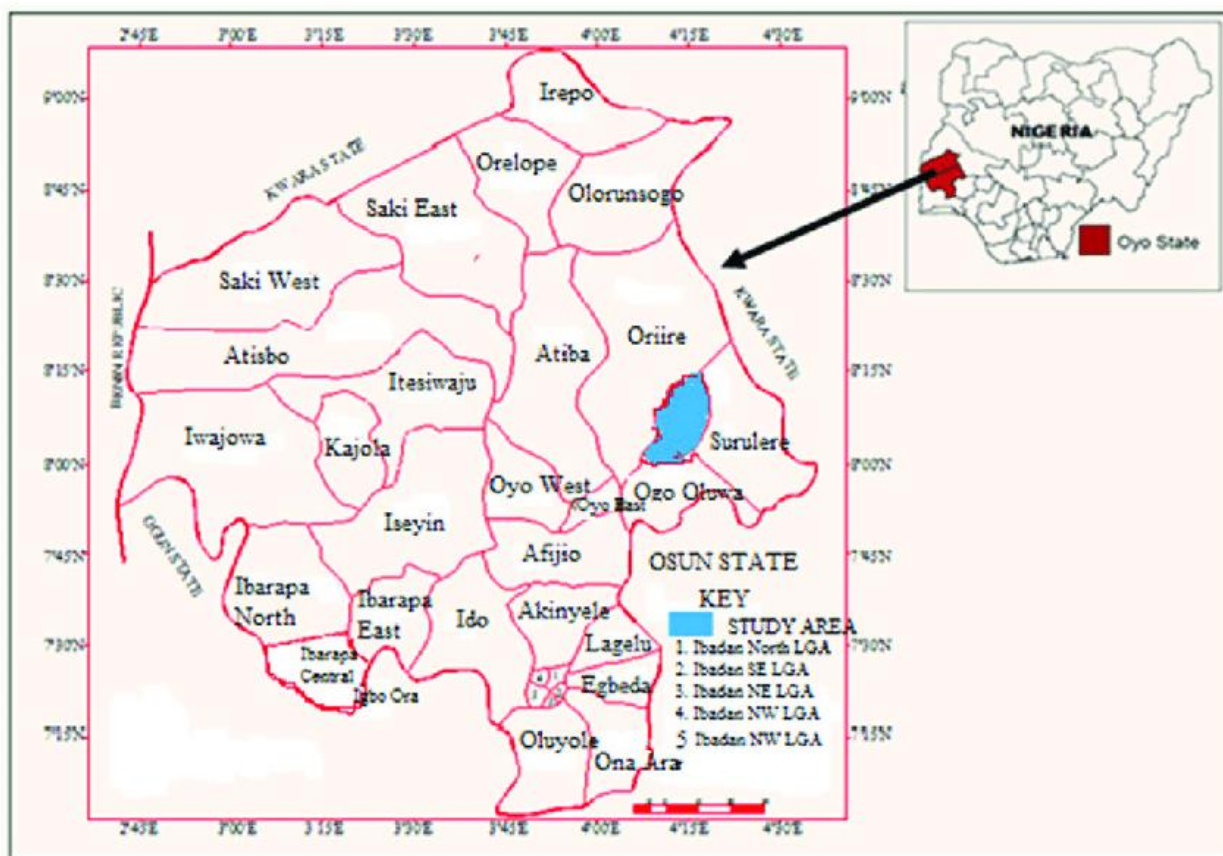


FIGURE 1: MAP OF OYO STATE SHOWING THE STUDY AREA

The respondents of the study are cashew farmers in Oyo. A multistage sampling technique were used to sample the respondents. The first stage involved a purposive selection of six (6) Local Government Areas (LGAs) from the state. Moreover, the purposively selected LGAs include Ogbomoso North, Ogbomoso South, Surulere, Ogo-oluwa, Oriire and Iseyin Local Government area (LGAs) from Oyo states. The LGAs were selected because they are cashew producing LGAs. A total of 6 LGAs were therefore covered in the survey. The second stage involved a purposive selection of two cashew producing communities from each of the purposively selected 6 cashew producing LGAs thus making a total of 12 selected communities for the study. A total of 229 cashew farmers from 639 registered cashew farmers were randomly selected from the selected 12 communities. They were randomly selected from the list of cashew farmers in each of the community. All the respondents randomly selected were selected proportionate to the size of the farmers in the

communities (Table 1) which formed the respective sampling frames in each chosen community randomly selected. The proportionate factor that was used is Yamane formula (1967):

The Yamane formula is expressed as;

$$n = \frac{N}{1+Ne^2} \tag{9}$$

n= sample size

N= finite population

e= limit of tolerable error (0.05)

Table 1: Sampling size final selection: Due to inconsistency and failure of seventeen (17) respondents to provide the vital and accurate information needed, two hundred and twenty-nine (229) respondents were finally employed for the study. The selection procedure is shown in table 1b below.

TABLE 1: DISTRIBUTION OF THE RESPONDENTS ACCORDING TO LOCAL GOVERNMENTS

State	LGAs	Communities	Cashew Farmers	
			Sampling Frame	Sample Size
Oyo	Oriire	Ikoyi	80	34
		Iluju	64	27

	Ogbomoso South	Ogbomoso	26	11
		Agric. Settlement	40	17
	Surulere	Iresa-apa	59	25
		Gambari	48	21
	Ogo-oluwa	Ajaawa	65	28
		Odo-oba	48	21
	Iseyin	Iseyin	42	18
		Maya	16	07
	Ogbomoso North	Ogbomoso	15	06
		Ikose	32	14
Total	6	12	535	229

Source: Field survey, 2023

ANALYTICAL TECHNIQUES

This study’s data were analyzed using Stata version 17 (StataCorp, 2021) and Microsoft Excel 365 (Microsoft, 2021). The various value addition practiced by the cashew producers in the study area were analyzed using double log regression model analysis and and One-Way Analysis of Variance (ANOVA).

MODEL SPECIFICATION:

A DOUBLE-LOG REGRESSION MODEL

A Double-log Model is a model where both the dependent variable (Y) and the right hand side variables (i.e., X₁, ..., X_k) have been transformed by the natural logarithm. This was used to estimate the factors that influence value addition among the actors in the value chain and is stated as follows:

Double log functional form

$$\ln Y = \ln \alpha + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + \dots + \mu \tag{1}$$

Where; a = intercept

$\beta_1 - \beta_{13}$ = regression coefficients estimated

ln denotes the natural logarithm.

e = Error term

Three separate regression analyses were carried out for each actor for the three years, one for 2019, 2020 and the other for 2021 with the model expressed implicitly as follows:

Y = value addition of each actor for 2019/2020/2021.

X₁= Age (years)

X₂ = Marital status (married = 1 otherwise =0)

X₃= Years of Education (years)

X₄= Level of production/marketing/processing

X₅= Farm size (hectare)

X₆= Contract farming (dummy)

X₇ = Years of experience (years)

X₈ = Gender (dummy)

X₉ = Credit access (access = 1 otherwise =0)

X₁₀ = Weather variation (1=yes, 0= otherwise)

X₁₁ = Harvesting method & time (prompt harvesting = 1, otherwise 0)

X₁₂ = Household size (Number of people living and feeding from the same pot)

X₁₃= Drying slab or space (dummy)

X₁₄= Cost of labour (Naira)

X₁₅= Storage facility (dummy)

X₁₆= Market outlets (dummy)

X₁₇= Processing facilities (dummy)

X₁₈= Distance to farm (km)

X₁₉= Distance to market (km)

X₂₀= Distance to processing unit (km)

ONE-WAY ANALYSIS OF VARIANCE (ANOVA)

One-way analysis of variance (ANOVA) for independent groups is used to test whether the group means for a specific dependent variable differ significantly after exposing each group to a unique level of a single factor or independent variable (Norton, *et al.*,1985). The tool is used to detect a difference in means of 3 or more independent groups. It compares the means of the samples or groups in order to make inferences about the population means. In this study, ANOVA was used to test for the hypotheses. This was used to estimate the difference in value addition to cashew nut among the various value chain actors in the study area.

3. RESULTS AND DISCUSSION

FACTORS INFLUENCING VALUE ADDITION AMONG

THE CASHEW NUT VALUE CHAIN AMONG PRODUCERS

The result as presented on Table 2 showed determining variables of value addition among cashew nut producers for the period of two years. Variables such as age, gender, marital status, farmer's level of production, education, farm size, credit access, weather variability market price, drying labour space, cost of labour, storage facility, capital, market outlets processing facilities, time of harvest and years of experience were regressed against value addition of the producers. For the 2019 production season, the result showed that the coefficient of gender, farm size, and years of experience to be positive and statistically significant while credit access of the producers show negative coefficient and significant at 5% level of confidence. The coefficient of gender was significant at 1% level of confidence, this indicated that there will be increased cashew nut value addition among the producers with more male cashew producers. Also, the coefficient of farm size was significant at 1%, an indication that an increasing farm size will increase cashew value addition among the producers in the study area, *ceteri paribus*. Furthermore, the result in this same year showed education had significant influence on cashew value addition among the producers in the study area. Cashew nut producers will have increase output as much as they are educated. This is evidence from the result as presented on Table 4.55. Meanwhile, the variable – credit access showed a negative sign and negate the a-priori expectation, though it is equally significant at 5% level. This indicated that increasing credit access reduces cashew nut value addition among the producers in the study area.

Additionally, the result for the year 2020 showed improvement over the previous year. About 9 variables were significant in this year with various level of significance. The coefficient of sex, farm size and years of experience were all positive and significant at 1% level of significance. Both age and educational status of the producers also influence value addition of the producers in the same year. The coefficient of these variables were significant at 5% level. Also, the coefficient of cost of labour was negative but significant at 10% level and both market outlet and processing facilities were positive and also significant at 10% level. With increase in cost of labour in the year 2020 production season, value addition of cashew nut producers reduces by 0.2199; this indicated that most cashew nut producer have over utilized labour and additional cost on labour will negatively affect their expected value addition. The positive coefficient of other variables signifies that increase in these variables will lead to increase in value addition of cashew nut producer. That is, additional male producer, age, education, farm size, market outlet, processing facilities and years of experience will increase value addition of cashew nut producers in the study area.

The result in the year 2021 revealed that the coefficient of age, farm size, contract farming, weather variation, harvesting method and/or time, storage facility and years of experience significantly determine value addition among the cashew nut producers. The result followed the a-priori expectation. Age at this time was negative and it implied that increase in age of the respondents will lead to decrease in value addition of cashew nut producers in the study area. The result stands due to the fact that the respondents were becoming aged and this accounted for less agility and productivity. Conversely, the coefficient of farm size showed positive relationship with value addition in the study area. The result indicated that a unit increase in farm size will increase value addition among cashew producers in the study area. Increasing farm size is justifiable, since most of the respondents were still smallholder cashew producers.

Lastly, year of experience showed positive and significant relationship with value addition. This result indicated that most of the cashew producers with increasing experience in cashew production have higher value addition. The implication of this, was that experience in cashew nut production plays a significant role in enhancing value addition among cashew nut producers in the study area. Meanwhile, cost of labour was not significant this year but it still showed a negative sign. The effect of weather variation cannot be overlooked, the variable was significant and it quite influence value addition of cashew producers in the study area. The result implied that changes experience in weather might deter value addition of cashew nut in the study area. Most of the time, whenever there is change in weather, it significantly affects cashew output and this invariably reduced value addition of the product in the study area.

Additionally, the result showed that both contract farming and storage facility increases value addition in the study area. The result as presented here showed that a unit increase in contract farmers enhances value addition of cashew producers by 0.3438; this indicated that the more the cashew nut contract farmers in the study area the more the value addition. The reason might not be far-fetched, major marketers or processors will demand and accept good and quality cashew nut from their contract farmers and these farmers since they have readily market available for their produce, thus ensure their produce comes out good to entice good premium. And at the same time, sometimes, inputs were made available for these farmers which will ensure smooth production, all things being equal. One of the major challenges cashew nut farmers has is the problem of storage. This imposes serious precaution on the producer especially in decision of when to have and how to store their produce. From the result, it was evident that, increase in storage facility and availability will enhance value addition of these producers. At this provision, producers are less panic at fluctuating price of the commodity and they have the best price to sell their produce.

TABLE 2: FACTORS INFLUENCING VALUE ADDITION AMONG THE CASHEW NUT PRODUCERS

Variables	2019			2020		
	Coefficient	Std. dev.	t-value	Coefficient	Std. dev.	t-value
Marital status	-0.0316	0.0453	-0.70	0.0573	0.0573	1.00
Level of production	0.0048	0.0354	0.14	0.0257	0.0448	0.57
Gender	0.3198	0.0753	4.25***	0.2450	0.0952	2.57***
Age	0.0058	0.0046	1.26	-0.0001	0.0001	2.26**
Education	0.0055	0.0060	0.91	-0.0171	0.0077	2.24**
Farm size	0.0779	0.0291	2.68***	0.0994	0.0341	2.91***
Credit access	0.1774	0.0896	1.98**	0.0259	0.1133	0.23
Weather variation	0.0568	0.0618	0.92	-0.0485	0.0781	-0.62
Market price	0.0112	0.0380	0.30	-0.0504	0.0480	-1.05
Drying slab/space	-0.0538	0.1050	-0.51	0.1304	0.1328	0.98
Cost of labour	-0.0914	0.1057	-0.86	-0.2199	0.1337	-1.65*
Storage facility	-0.0144	0.0552	-0.26	0.0149	0.0698	0.21
Contract farming	0.0178	0.0528	0.34	0.0123	0.0667	0.18
Market outlets	0.0539	0.0663	0.81	0.1431	0.0838	1.71*
Processing facilities	0.0726	0.0672	1.08	-0.1474	0.0849	-1.74*
Harvesting method & time	0.0403	0.0554	0.73	-0.0145	0.0702	-0.21
Years of experience	0.3894	0.1397	2.79***	0.5255	0.1767	2.97***
_cons	10.2043	1.1732	8.70***	8.7561	1.4834	5.90***

Source: Field Survey, 2023

*** Statistically significant at 1% level, ** Statistically significant at 5% level, * Statistically significant at 10% level

TEST OF HYPOTHESIS

H₀: There is no significant difference in value addition to cashew nut among the cashew producers

TEST OF THE DIFFERENCE IN VALUE ADDITION AMONG THE CASHEW NUT PRODUCERS

H₀: There is no significant difference in value addition to cashew nut among the cashew producers in the study area.

Findings in Table 3 reviewed significant differences (F =11.55, p = 0.0000) in value addition of cashew nut

producers in the study area. Given that the p-value is less than 0.05, then the null hypothesis H₀ is rejected. Therefore, study concludes that there is a statistically significant difference in value addition to cashew nuts among the cashew producers in the study area.

Additionally, Bartlett's test for equal variances yielded a chi-squared value of 4.1001 with a p-value of 0.129, suggesting that the assumption of equal variances among groups holds, as the p-value is greater than 0.05.

TABLE 3: DIFFERENCE IN VALUE ADDITION AMONG CASHEW NUT PRODUCERS

Variable	Sum of squares	Differences	Mean squares	F	Sig.	Decision
Between groups	24969239.6	2	12484619.8	11.55	0.0000	Significant
Within groups	244199166	226	1080527.28			

Total	269168406	228	1180563.18			
Bartlett's test for equal variances: $\chi^2(2) = 4.1001$						
Prob>	0.129					

Source: Field Survey, 2023

4. CONCLUSION AND RECOMMENDATIONS

It was concluded that in 2019, cashew nut producers will have increase output as much as they are educated. With increase in cost of labour in the year 2020 production season, most cashew nut producer have over utilized labour and additional cost on labour will negatively affect their expected value addition. The more the cashew nut contract farmers in the study area the more the value addition in 2021. Therefore, cashew producers should be educated. They should also optimize the cost of labour. More contract farmers should be involved in cashew production.

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