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Profitability of Cashew Nut Processing and Marketing in Enugu State, Nigeria

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Abstract
The study assessed the profitability of cashew nut processing and marketing in Enugu State, Nigeria. Specifically, the study described the socio-economic characteristics of the cashew nut processors, examined the channels in which cashew nut is marketed, estimated the cost and returns of cashew nut processing and marketing, and assessed the factors affecting the profitability of cashew marketing. A multi-stage sampling procedure was employed in selecting 126 respondents out of which 95 questionnaires were returned and used for the study. Primary data used were collected using structured questionnaires and analyzed using descriptive statistics such as frequency, percentage, and means; gross margin analysis and multiple regression analysis. The study showed that the major marketing channel of cashew nut marketing was the use of sale agents (70.5%) and retailers to consumers (65.3%). The cost and return analysis of cashew nut processing and marketing revealed the net return to investment as 0.20, 0.37, 0.34 and 0.29 for processors to wholesalers, wholesalers to retailers, retailers to consumers, and use of sale agents respectively, indicating that out of every Naira (N) spent on cashew processing and marketing, 20, 37, 34 and 29 Kobo accrued as the net profit respectively, thus indicating that cashew processing and marketing is profitable in the study area. The study showed that age, years of experience, amount processed and amount sold were significant factors affecting the profitability of cashew nut processing and marketing all at a 5% probability level. The study recommended that Government should invest in cashew nut production through the establishment of more cashew tree plantations and planting of improved cashew seedlings; and enlighten cashew processors on the more profitable marketing channels.

Keywords: Profitability, cashew, marketing, gross margin analysis

Introduction

Cashew (*Anacardium occidentale L*) is a multipurpose tree crop with wide ecological distribution within Nigeria and has an array of economic importance (Oluyole *et al.*, 2015). The perennial drought resistant, evergreen cashew tree is economically grown for its nut, apple and wood. Products derived from the nuts include the world's highly delighted roasted kernel snacks, kernel oil, cashew nut shell liquid, and from the apple: juice, jam, and alcohol among others (Adeigbe *et al.*, 2015). Apart from being a source of useful products and byproducts for food, medicinal and industrial applications, cashew also gives a useful shade. As an ornamental and alley tree, it is suitable for the control of soil erosion, particularly for the protection of watersheds and dams (Oluyole *et al*, 2015). Production, processing, and marketing of cashew provide employment and income generation for smallholder farmers in Nigeria (Adeigbe *et al.*, 2015). Cashew is an important cash crop that earns foreign exchange and contributes significantly to the Nigerian economy. According to the National Cashew Association of Nigeria (NCAN), the export of cashew nuts from 2015 planting season gave Nigeria about N50 billion. This was an improvement of N24b the sub-sector contributed in 2013 and 2014 (Agbongiarhuoyi *et al*, 2020). Cashew earns Nigeria USD 374 Million from the export of raw cashew nuts (RCNs) and the country exported 220,000 tonnes of RCNs in 2017 as against 160,000 tonnes in 2016 (Adeniji, 2018). Nigeria is among the leading exporters of quality raw cashew nuts, with an average 48 kernel Output Ratio KOR (Nigerian Export Promotion Council, 2018).

The majority of the exports produce from quality nuts came from the Eastern and Western parts of the country. The main suppliers of these fruit are the peasants farmers who collect the nuts from the trees growing

(sub) spontaneously in the area. Many of these farmers have however planted cashew trees around their houses or even have small groves of their own. The area under cashew is steadily increasing because of growing demands and rising prices (Onoh and Udah, 2015). In 2021, global production of cashew nuts was 3,708,153.12 tonnes. The major cashew-producing countries in the world between the period 2010-2021 and their respective average outputs were India (723383.33 MT), Ivory Coast (619398.89 MT), India (772,779 MT), Vietnam (303162.86 MT), Nigeria (232248.94 MT), Philippines (195417.43 MT), Tanzania (184524.75 MT) and Benin (153914.71 MT) (FAOSTAT, 2022). Nigerian cashew production output declined from 800,000 MT in 2009 where Nigeria maintained a leading position in the world cashew production, to 118623.66 MT in 2021 placing Nigeria on 11th position in the world. Cashew grows in almost every part of Nigeria although commercially, it is largely produced in the southern and the middle belt zones of the country. The major cashew producing States are Abia, Enugu, Anambra, Ekiti, Benue, Kwara, Kogi, Oyo, and Imo (Ojedokun *et al*, 2020). Nigeria farmers earned $404 million from the export of the cash crop in 2017 and between 2015 and 2017; they earned $813.05 in foreign exchange from the exportation of cashew (Ogah *et al*, 2020). But despite the promises the produce holds, its potentials are yet to be fully harnessed, due to several factors, which include lack of capacity, poor storage facility for cashew fruits and many more. For instance, an estimated eight million tonnes of the fruits are wasted yearly (Gbenga, 2019).

In Enugu state Nigeria, local cashew nut marketers mostly made up of youths and women are engaged in small-scale cashew nut enterprise as a means of livelihood. The cashew marketers in Enugu State mostly gather the cashew fruits from the communal cashew plantations/ farms or their individually owned cashew plantations. Some farmers have their own cashew plantations from which they harvest and sell to the local cashew marketers that come to the plantation, while some take the harvested cashew to the central market where they sell to the middlemen. Cashew marketing is characterized by seasonality, unstable supply and price fluctuation. The international cashew market changes rapidly and unpredictably, with increasing demand but constraints and variations in supply. Prices are rising over time but are also subject to sharp fluctuations (Ameh *et al*, 2022). According to Farayola *et al*, (2013), the production of cashew is mostly in the hands of small-scale farmers. A greater proportion of cashew production is from wild trees while its distribution is in the hands of a large number of exploitative middlemen who pay producers far below what the consumer pay for the product. According to Ameh *et al*, (2022), middlemen take advantage of the unregulated cashew nut market and lack of current market price information by farmers to exploit them. In view of the foregoing, the study assessed the profitability of cashew nut marketing in Enugu State, Nigeria. Specifically, the study described the socio-economic characteristics of the cashew nut processors; identified the channels in which the cashew products are marketed, determined the cost and returns in cashew nut processing and marketing and assessed the factors affecting the profitability of cashew marketing.

Methodology

The study was conducted in Enugu state, Nigeria. Enugu state is one of the states in the eastern part of Nigeria. Enugu state is located at $6^0$30' North of Equator, and $7^0$30' East of Latitude. It covers an area of 7,161 km2 (2,765sq mi), and ranks 29th out of the 36 States of Nigeria in terms of land area. Enugu State is also densely populated, with an estimated population of 4,411,119 and is rated at 460/km2 (1,200/sq mi) (NBS, 2016). According to ENADEP (2009), Enugu State is divided into three (3) major agricultural zones which are Enugu North, Enugu East, and Enugu West. Economically, the state is predominantly rural and agrarian. The common food crops grown in the state include maize, cassava, cocoyam, melon etc. Enugu is one of the major producers of cashew in Nigeria. Cashew is largely produced in three of the Local Government Areas which are Ezeagu, Igbo-etiti and Uzo-uwani LGAs. Most cashew producers and marketers have it as the sole or major source of income from which they cater for themselves and their families. A multi-stage sampling procedure was employed in selecting the sample for the study. The first stage involved a purposive selection of six Local Government Areas from the seventeen Local Government Areas in Enugu state. The selected Local Government Areas were those that are largely involved in cashew production and marketing. In the second stage, three (3) autonomous communities were randomly selected from each of the selected Local Government Areas. From the selected autonomous communities, seven (7) cashew dealers were randomly selected thus making a total of 126 respondents, which constitute the sample for the study. Out of these, 95 questionnaires were returned and used for the study. Primary data used for the study were obtained using an interview schedule from a well-structured questionnaire. Descriptive statistics such as frequency, percentage, means and charts were used in analyzing the data. Gross Margin analysis was used to estimate the profitability of cashew marketing.

The model for gross margin analysis is specified as:

$$GM = GFI - TVC$$

Where GM = Gross margin (in Naira)
GFI = Gross income (Naira)
TVC = Total variable cost (Naira)

Multiple Regression Analysis for Factors affecting the Profitability of Cashew

Implicitly, the model is specified as:

$$Y = F(X_1, X_2, \ldots\ldots\ldots\ldots\ldots X_9) + ei\ldots\ldots \quad (1)$$

Where Y = Profitability in Naira (revenue – expenses)
X_1 = Age of cashew marketers (Years)

X_2 = Marital status (Married = 1, Otherwise = 0)
X_3 = Education level of cashew marketers (schooling years)
X^4 = Sex (1=male, 0=female)
X_5 = Household size (No of persons)
X_6 = Years of experience of cashew marketers (Years)
X_7 = Access to credit (Yes = 1, No = 0)
X^8 = Amount processed (N)
X_9 = Quantity sold (Kg)
ei = Error term

Results and Discussion

Cashew Nut Marketing Channel

Figure 1 shows the marketing channel of cashew nut marketing in Enugu State Nigeria. The result in Figure 1 revealed that a greater proportion of cashew nut marketers (70.5%) sell their cashew nuts to consumers using sales agents. 65.3% are retailers selling their cashew nuts to consumers, 47.4% sell their cashew nuts in whole sale to retailers and 20.0% were processors selling their cashew nut to the wholesalers. The fact that a greater proportion of the cashew nut marketers sell their cashew nut using sales agents could suggest that the cashew nut marketers were mostly large scale sellers who distribute their large processed cashew nuts to their various outlets using sales agents.

Cost and Returns Analysis of Cashew Nut Marketing

Table 1 shows the cost and returns analysis of cashew nut marketing in Enugu State, Nigeria.

From Table 4.2, the cost of cashew nut constitute the highest cost in all the marketing channels, constituting 61.88%, 68.07%, 65.99%, and 65.26% of the total cost in processors to wholesalers, wholesalers to retailers, retailers to consumers, use of sale agents respectively. The cost of cashew nuts constitutes 62.18% of the total cost across all the marketing channels. For processors to wholesalers, the total variable cost constitutes 68.57%, while the total fixed cost constitutes 31.43 % of the total cost. For wholesalers to retailers, total variable cost constitutes 73.98% while total fixed cost constitutes 26.02% of the total cost. For retailers to consumers, the total variable cost constitutes 72.64%, while the total fixed cost constitutes 27.35% of the total cost. For the use of sale agents, total variable cost constitutes 71.20% while total fixed cost constitutes 28.80% of the total cost. Total variable cost constitutes 68.08% while total fixed cost constitutes 31.92% of the total cost across all the marketing channels. This shows that the cashew business involves a relatively fairly high operational cost. For processors to wholesalers, the average return on sales was 0.17. This indicates that out of every Naira (N) earned, about 17 Kobo accrue to the cashew business as net income. The return on investment was 0.20, which indicates that out of every Naira (N) spent on cashew marketing, 20 Kobo accrue as the net profit. For wholesalers to retailers, the average return on sales was 0.27. This indicates that out of every Naira (N) earned, about 27 Kobo accrue to the cashew business as net income. The return on investment was 0.37, which indicates that out of every Naira (N) spent on cashew marketing, 37 Kobo accrue as the net profit. For retailers to consumers, the average return on sales was 0.26. This indicates that out of every Naira (N) earned, about 26 Kobo accrue to the cashew business as net income. The return on investment was 0.34, which indicates that out of every Naira (N) spent on cashew marketing, 34 Kobo accrue as the net profit. For the use of sales agents, the average return on sales was 0.23. This indicates that out of every Naira (N) earned, about 23 Kobo accrue to the cashew business as net income. The return on investment was 0.29, which indicates that out of every Naira (N) spent on cashew marketing, 29 Kobo accrue as the net profit. Across all the marketing channels, the average return on sales was 0.22. This indicates that out of every Naira (N) earned, about 22 Kobo accrue to the cashew business as net income. The return on investment was 0.28, which indicates that out of every Naira (N) spent on cashew marketing, 28 Kobo accrue as the net profit. This shows that cashew marketing is profitable in the study area. However, the wholesalers-to-retailers marketing channel was the most profitable among the marketing channels with a return to investment of 0.37. This is followed by retailers to consumers (0.34), and the use of sale agents (0.29), while processors to wholesalers were the least profitable with a return to investment of 0.20. This is consistent with the findings of Ameh *et al* (2022) on the market performance of cashew nuts among marketers which showed a positive gross margin affirming that cashew nut marketing is a profitable business. Similarly, Oladejo (2015) in his study shows that the cashew nut marketing enterprise is profitable with a gross margin of N53,168.31 per ton of cashew nut transacted and benefit-cost ratio (BCR) of 2.01. Furthermore, Ojedokun *et al* (2020) also showed that cashew nut marketing is productive and profitable.

Factors Affecting the Profitability of Cashew Nut Business in Enugu State

Table 2 shows the multiple regression estimates of factors affecting the profitability of the cashew business in Enugu State Nigeria. Cobb Douglas was chosen as the lead equation among the four function regression forms. This was based on the magnitude of the R^2 value, the F-ratio value and the number of significant variables. From Table 2, the R^2 value of 0.634 shows that 63.4% of the variations in profitability were explained by the independent variables. The F-ratio value of 4.626 which was highly significant at 1% probability level shows that the model has a good fit. The significant variables affecting the profitability of cashew nut business in Enugu State were age, years of experience, amount processed and amount sold. The co-efficient of age (1.217) was positive and significant at 5% probability level. This implies that the profitability of cashew nut business increases with an increase in age. This may be due to the experience and high sense of maturity accruing to older individuals. This is consistent with the findings of Onoh and Udah (2015) where age was found to have significant positive influence on output of cashew. In Farayola *et al.* (2013), age was also found to have a significant positive influence on total revenue of cashew. The co-efficient of years of experience (0.368)

was positive and significant at 5% probability level. This indicates that the profitability of cashew business increases with an increase in years of experience. This is in accordance with the expectation. Increased years of experience depict increase in proficiency and increased exposure to different environment and incidents which makes an individual to be more knowledgeable and efficient in controlling and managing his business which makes for greater profitability. This is in line with the findings of Onoh and Udah (2015) who posited that more experience come with new innovations and ideas to project exportable commodities. The co-efficient of amount of cashew nut processed (0.503) was positive and significant at 5% probability level. This implies that as the amount of cashew nut processed increases, the profitability of the business also increases. This is in line with the expectation, because as more cashew nut are processed and sold, more income is realized, hence more profit is being made. This finding corroborate the findings of Farayola *et al,* (2013) where quantity of cashew sold was found to have significant positive influence with total revenue from cashew nut. The co-efficient of amount sold (0.701) was also positive and significant at 5% probability level. This implies that as the amount of cashew nut sold increases, the profitability of the business also increases. This is so because as more cashew nut is sold, more income is realized hence more profit is being made. This is consistent with the findings of Ojedokun *et al* (2020) which showed significant positive relationship between selling price and profitability of cashew nut.

Conclusion

The study analyzed the profitability of cashew nut marketing in Enugu State, Nigeria. The study showed that the major marketing channel of cashew nuts in Enugu State is the use of sales agents. Cashew nut marketing was shown to be is profitable in the study. The factors affecting the profitability of cashew nut marketing are age, years of marketing experience, amount processed and amount sold. Therefore, the study recommended that: Government should explore the area of cashew nut production through the establishment of more cashew tree plantations and planting of improved cashew seedlings so as to enhance the production of more quality cashew nuts. Cashews processors and marketers should be enlightened on the more profitable marketing channels to use so as to lower costs and increase the profitability of the business.

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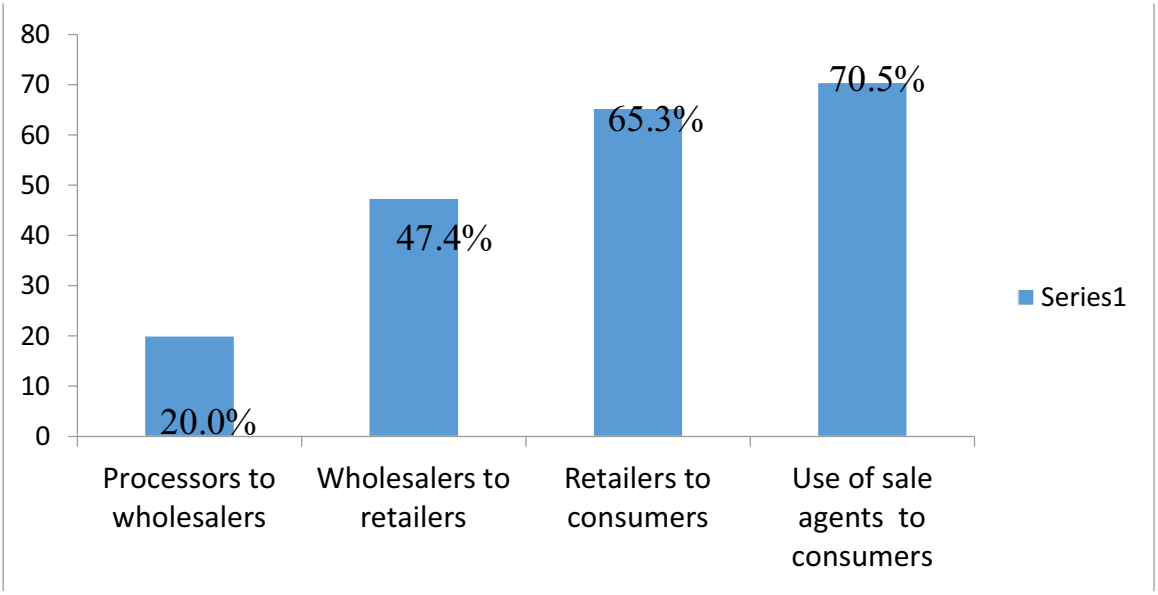

Figure 1: Marketing channel of cashew nut in Enugu State, Nigeria

Table 1: Cost and returns analysis of cashew nut marketing

Items	Processors to wholesalers	Wholesalers to Retailers	Retailers to consumers	Use of sale agents	Across all marketing channels
Fixed cost					
Rent on land	587000	925000	1320000	1620000	2590000
Tools/machinery	3050	7250	9750	10400	15000
Basket/pots	27700	61200	84800	94700	131200
Basin/tray	24700	60500	86300	92000	129800
Total fixed cost	**642450**	**1053950**	**1500850**	**1817100**	**2866000**
Variable cost					
Cost of cashew nuts	1265000	2757500	3621000	4117500	5583500
Transportation cost	51400	79800	104800	104700	161200
Labour	24000	47500	60500	67300	94800
Firewood	42400	74100	144000	143000	189000
Storage cost	2700	3850	7050	7300	9650
Miscellaneous expenditures	16400	34300	49000	52300	75300
Total variable cost	**1401900**	**2997050**	**3986350**	**4492100**	**6113450**
Total Cost	**2044350**	**4051000**	**5487200**	**6309200**	**8,979,450**
Total Revenue (Gross income)	2454200	5558300	7369600	8158300	11544100
Gross margin (N) (GI –TVC)	1052300	2561250	3383250	3666200	5430650
Net Farm income (GM-TFC)	409850	1507300	1882400	1849100	2564650
Return to investment (NFI/TC)	0.20	0.37	0.34	0.29	0.28
Return on sales (NFI/TR)	0.17	0.27	0.26	0.23	0.22

Source: Field survey, 2020

Table 2: Multiple regression estimates of factors affecting the profitability of cashew Enugu State

Parameters	Linear	Exponential	Semi-log	+ Double log
Constant	-53675.8(-2.486)**	9.1 (12.123)***	-990254.0(-4.728)***	-5.1 (-2.435)**
Age	1298.6(1.237)	0.02(1.284)	82244.9(2.202)**	1.2(2.206)**
Marital status	-5271.0(-0.370)	-0.19(-0.877)	-9881.9(-0.719)	-0.3(-1.537)
Educational qualification	-592.5(-0.360)	-0.006(-0.223)	7616.186 (0.470)	0.04(0.172)
Sex	17125.3(1.137)	0.28(1.274)	10611.5(0.718)	0.21(1.020)
Household size	1572.0(0.550)	0.026(0.591)	4381.4(0.259)	0.070.301)
Years of experience	355.6(0.363)	-0.003(-0. 219)	-4872.9(-0.508)	0.3(2.486)**
Access to credit	-1463.3(-0.116)	0.03(0. 157)	-898.8(1.718)*	0.05(0.302)
Amount processed	0.03(2.692)***	4.192E-008(2.017)**	42992.1(2.266)**	0.5(2.318)**
Amount sold	0.5(2.094)**	8.118E-006(2.155)**	41256.22.183)**	0.7(2.204)**
R-square	0.567	0.436	0.542	0.634
R-Adjusted	0.389	0.352	0.367	0.473
F – ratio	3.435***	2.812***	4.268***	4.626***

Source: Computed from field survey, 2020
Key: *, ** and *** is significant at 10%, 5% and 1% level of probability respectively
+ = Lead Equation and the values in bracket are the t-values.
Y = Profit