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PROFITABILITY OF *Cocos nucifera* OIL IN CHIKUN LOCAL GOVERNMENT AREA OF KADUNA STATE. NIGERIA

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ABSTRACT

The study was conducted to survey the processing and marketing of *Cocos nucifera* oil in Chikun LGA of Kaduna state, Nigeria. A multistage sampling technique was adopted. On the first and second stages, 5 wards namely Narayi, Sabon tasha, Nasarawa, Rido, Chikun and 2 markets from each ward were purposively selected, on the third stage, (24) respondents were randomly selected from each market which gave a total sample size of 120 respondents. Data was obtained with the aid of a well-structured and open-ended questionnaire administered among selected processors and marketers. Descriptive statistics and profit margin analysis was used to analyse the data. Results obtained indicated that 98.3% of the respondents were females, 54.2% falls within the age group of 41-50 years, 82.5% were married, 42.5% falls within the household size of 6-10 individuals, 65.8% had secondary education, 55.0% and 67.5% have *Cocos nucifera* business as their major occupation. Results indicated that, 53.3% of the respondents had 6 - 10 years of experience. Marketing channels indicated that, 51.7% obtained their products from the assemblers, had monthly sale revenue of ₦130,550.00, total cost ₦76,850 and gross profit margin of ₦53,700 per month. However, the return on investment (ROI) showed that, *Cocos nucifera* oil marketers incurred 41.13% from their business. Cost of labour and transportation are the major constraint of coconut oil business. From this research, coconut oil business is profitable. There is need for new techniques and equipments to simplify the processing of coconut oil business to reduce labour cost.

Key words: Non-Timber Forest Products, Processing, Marketing, *Cocos nucifera*

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INTRODUCTION

Worldwide, forest provides a large variety of wood and non-timber forest products (NTFPs) or non-wood forest products (NWFPs) which enhance economic development when under proper utilization (Stryamet *et al.*, 2011). NWFTs are products of biological origin other than wood and they can be derived from the wild, plantations forests, agro-forestry schemes as well as they can be harvested from trees outside the forest such trees in homestead (Hangen, 2011). The role of NWFPs in securing maintenance of food security, human health, cultural value and income generation in different places of the world is widely documented. According to Stryamet *et al*., 2011 about 80 percent of the population in developing countries depend on NWFPs for their nutritional needs, herbal medicine and cultural resources for local livelihood.

Palms are among the best known and most extensively cultivated plant families. They have

been important to humans throughout much of history. In contemporary times, palms are also widely used in landscaping; making them one of the most economically important plants (Dekker *et al.,* 2023). Coconut is one of the most important and useful palms in the world with Indonesia, Philippines and India respectively ranking as the topmost producers. Coconut farming is a cash tree that receives very little attention in Nigeria, it has great adaptation and incredible plasticity features that is undemanding, it adapts to many soil types and climates, it resists bad weather conditions and produces continuously from the age of 4 or 7 to 60 years. As an exotic species in Nigeria, it is blessed with coconut tree which could be harnessed for industrial development thereby improving the living standard of the people.

Coconut farming is a cash tree that receives very little attention in Nigeria, it has great adaptation and incredible plasticity features that is undemanding. The benefits in coconut if well harnessed can serve as one of the boosters of economic growth and development of the state and the country at large. This finding can be used to educate both processors, marketers and consumers of coconut on its nutritional, medicinal and economic values. The information if well disseminated through proper channels, will bridge the gap in lack of employment and poverty alleviation amongst the local people by drawing their attention to the numerous potentials in *cocos nucifera.*

In places like Chikun local government area of Kaduna state, coconut tree is used for land demarcation and landscape design. The leaves of the coconut Palm are used for thatching. The felled Coconut Palms are used for fuelwood and timber. Processing and marketing of Coconut can lead to reduction in food wastage, enhance food security and improve the livelihood of low-income group of men and women in area. For income generation, data generated from this study will serve as base-line information for future researchers. The major objective of this study is to examine the processing and marketing of coconut oil in Chikun LGA of Kaduna State.

METHODOLOGY

Study Area

Chikun is one of the 23 Local Government Areas of Kaduna and is located in the southern part of Kaduna State, it covers an area of about 4456.59 km^2 with the population of 550,000 (Projected population, 2022) and lies between the latitude 10°17’6”N and longitude 7°6’37”E. Chikun has two distinct seasons. The dry season lasts from November to mid-April while the rainy reason, which is cool and lasts between 5 and 6 months, starts from mid-April. The average temperature of the area is 24.8°C, with a yearly average precipitation of about 28.1 mm (1.11in) and average humidity of 53.3%, the State extends from the tropical grassland known as the Guinea savanna to the Sudan Savanna. Vegetation is thick with grasses about 3.6 m tall with big trees, which grow shorter as one approaches the Sudan savanna.

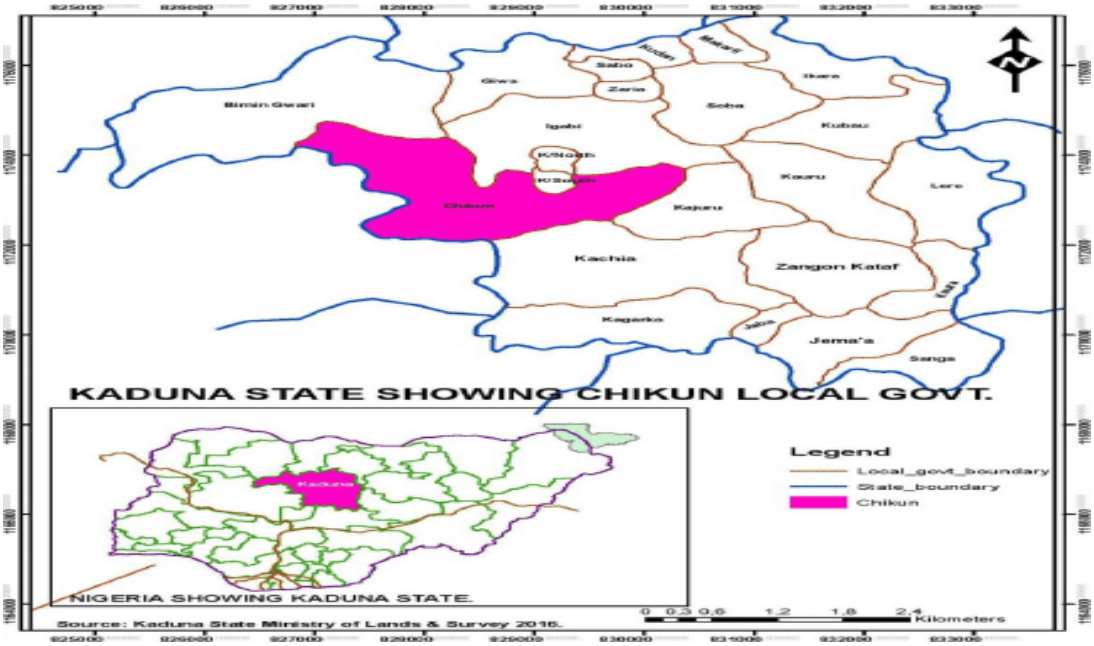

Figure 1: Map of Kaduna State showing Chikun Local Government Area

Sampling Design

A multistage sampling technique was adopted. On the first stage, 5 wards were purposively selected namely Narayi, Sabon tasha, Nasarawa, Rido and Chikun because of high concentration of coconut oil business. On the second stage, two (2) markets were purposively selected and the third stage, (24) respondents were randomly selected from each market which gave a total sample size of 120 respondents.

Sampling Procedure and Sample Size

LGA	Districts	Number of markets	No. of Respondents per Market
	Narayi	2	24
	Sabon tasha	2	24
Chikun	Nasarawa	2	24
	Rido	2	24
	Chikun	2	24
	Total	**10**	**120**

Data Collection and Data Analysis

Data for the study were collected from primary and secondary sources. Primary data was collected through the use of interview schedule using an outlined structure and open-ended questionnaire especially with the respondents who are not literate enough to complete the questionnaire. Data were collected on socioeconomic aspects, as well as the inputs and outputs of coconut oil marketing.

Data collected were analysed using both descriptive and inferential statistics. Profit margin was used to achieve the profitability of the fuelwood marketers.

GM = TR – TVC ……1

$$ROR = \frac{GM}{TR} \times 100 \ldots\ldots 2$$

RESULTS AND DISCUSSION

Socio-economic Characteristics of Respondents

Gender

From table 1a, the result showed that, (98.3%) of the respondent in the study area are female while (1.7%) are male. Results indicated that, the female respondent dominates the overall population gender strength of the business in the community. The findings were supported by Charles (2016) who stated that, women participate in rural coconut processing marketing

since they could utilize their extra time after routine household activities and earn an income and that of Okpara *et al*., (2023) who observed that, women marketers participated in the assembling, storage, buying and selling of palm oil in their research, "Analysis of Palm Oil Marketing among Women Marketers in Umuahia Agricultural Zone, Abia State".

Age

Majority of the respondents (54.2%) fall within the age group of 41-50 years, while (10.0%) fall to the age group of 20-30 years. From the above result, the differences in the age group are as a result of the systematic sampling chosen to conduct the research study in order to generate competent and accurate data in the study area. This means that processing and marketing of coconut oil in the study area is relatively dominated by youth who are more active and stronger. This is in consonance with the findings of Ibitoye *et al.,* (2012) who asserted that young people are more agile and prone to risk-taking compared with old. Hence, they are innovative.

Marital Status

The results also showed that, (82.5%) of the respondent were married, whereas only (2.5%) are divorced respectively. Married people are assumed to be more committed to their responsibilities and therefore had the tendency to increase their business activities that would serve as sources of income used for the survival and welfare of their families. This finding agrees with the findings of Onu *et al*. (2021) who stated that, most of their respondents were married in their research "Characteristics of small-scale palm oil production enterprise in Anambra State".

Household Size

The study shows that majority (42.5%) of the respondent household size falls within 6-10 persons, while 9.2% of the respondents fall above 16 persons. Implying that, there was readily available family labour thereby reducing the cost of hired labour in their business. This finding has agreed with the work of Okuduwor *et al*., (2023) who reported that, (53.3%) of their respondents had household size of 6 – 10 persons in their research "Determinants of Marketable Surplus of African Bush Mango Kernel (Ogbono) in Kolokuma/Opokuma Local Government Area of Bayelsa State, Nigeria".

Level of education

This study revealed that, 65% of the respondent has secondary education, while 3.3% have no formal education. This shows that majority (96.7%) of the respondent are literate. The level of education affect the type of decision processors and marketers make, it also determines the level of opportunity available for them. The finding of this study agrees with the findings of Amaza and Maurice (2015) who reported that education enhances productivity among households and the work of Esiobu *et al.*, (2014) who reported that, having a good educational background is an added advantage in terms of achieving an efficient and sustainable marketing enterprise.

Occupation

The result in Table 1 revealed that, majority of the respondents (55.0% and 67.5%) have coconut products as their primary and secondary occupation. This finding disagreed with that of Senchi and Yakubu (2014) who indicated that, most of their respondents had farming as their primary occupation in the research "Assessment of Processors and Marketers of Sheabutter (*Vitellaria paradoxa* C. F. GAERTN.) in Zuru Local Government Area, Kebbi State, Nigeria" Although, the remaining respondents had one form of formal education or another.

Years of Experience

Based on their working experience in the processing and marketing of coconut oil, (53.3%) of the respondent have 6-10 experience, while (2.5%) of the respondent have above 16 years of experience. This is because the number of years is usually seen as how much of a professional the individual has become in the processing and marketing of NTFPs especially the *Cocos nucifera* oil. This is in agreement with the findings of Idiaye *et al*. (2022) in their research "Profit efficiency of palm oil processing in Osun state, Nigeria". This is also in line with the work of Schubert (2019) who reported that, the longer the year of marketing experience the better the decision making.

Table 1: Socio-Economic Characteristics of *Cocos nucifera* oil Marketers (N=120)

Factor	Frequency	Percent
Gender		
Male	2	1.7
Female	118	98.3
Age		
21-30	12	10.0
31-40	30	25.0
41-50	65	54.2
> 51	13	10.8
Marital status		
Married	99	82.5
Single	13	10.8
Divorce	3	2.5
Widow/widower	5	4.2
Household size		
1-5	37	30.8
6-10	51	42.5
11-15	21	17.5
> 61	11	9.2
Education		
Primary	32	26.7
Secondary	79	65.8
Tertiary	5	4.2
No Basic Education	4	3.3
Primary Occupation		
Farming	28	23.3
Coconut oil/fruit business	66	55.0
Trading	15	12.5
Animal Rearing	8	6.7
Others	3	2.5
Secondary Occupation		
Farming	24	20.0
Coconut oil/fruit business	81	67.5
Trading	4	3.3
Animal Rearing	9	7.5
Others	2	1.7
Years of Experience		
1-5	12	10.0
6-10	64	53.3
11-15	41	34.2
> 61	3	2.5
Total	**120**	**100.0**

Type of Labour and Processing Methods of *Coccos nucifera* Oil

From Table 2 above, the results revealed that, most of the respondents (98.3%) were involved in the processing of *Coccos nucifera* oil while others (1.7%) were not, although, they may be involved with the sourcing and marketing of the oil in the area. On the type of labour, most of the respondents (70.8%) use hired labour. The implication is that, they will find it easy to know the exact profit of their business, although, 20% use hired labour. This findings was in line with the findings of Senchi and Lukman (2017) who indicated that, 81.2% of their respondents use family labour in processing their sheabutter in their research, "Productivity of Non Timber Forest Products (NTFPs) Production and Marketing in Zuru Local Government Area, Kebbi State, Nigeria: A Case for Sheabutter". Majority of the respondents (67.5%) employed old method of processing (Traditional boiling method), while, few (4.2%) of the respondent are involved in wet processing method.

Also, the Table shows that majority of the respondent (80.0%) processed coconut oil in small quantity while, few (4.2%) of the respondent processed coconut oil in large quantity. In the same light, majority of the respondent (80.0%) measured their product (coconut oil) in millimeter (ml), while, few of the respondent (18.3%) measured their product in centiliter (cl).

Traditional Steps of processing coconut oil (Boiling Method)

Coconut Fruit
↓
Debarking
↓
Grinding
↓
Cooking the coconut milk in medium heat
↓
Extraction of the oil from the milk
↓
Cooling
↓
Packaging and sealing

Table 2: Type of Labour and Processing Methods of *Coccos nucifera* Oil

Factor	Frequency	Percent
Coconut Oil processing		
Yes	118	98.3
No	2	1.7
Type of Labour Used		
Family Labour	24	20.0
Hired Labour	85	70.8
Both	11	9.2
Processing Methods		
Traditional Boiling Method	81	67.5
Dry Processing Method	34	28.3
Wet Method	5	4.2
Quantity processed		
Large	5	4.2
Medium	19	15.8
Small	96	80.0
Measurement of Coconut Oil		
Litres (Gallons 1 - 5)	2	1.7
Centiliters (Bottles)	22	18.3
Mililitres	96	80.0
Total	**120**	**100.0**

Marketing Channels of Coconut Oil

Marketing channel is the way products get to the end-user or consumers and is also known as a distribution channel according to (Shretha, 2020). Farooq (2016), define it as the route or path through which products are transferred from the place of production to the final consumer. It consists the following set of people and their activities such as producers, middle men, wholesalers, retailers and final consumers.

Figure 2 above revealed that, majority of the respondents (51.7%) source their product from assemblers while, (5.0%) of the repondents source from farmland. This implies that, farmers conserved multipurpose tree stands of *Coccos nucifera* as the means of agroforestry. This findings was in line with the findings of Senchi and Lukman (2017) who indicated that, 37.5% of their respondents source their sheabutter nuts from the market in their research, “Productivity

of Non Timber Forest Products (NTFPs) Production and Marketing in Zuru Local Government Area, Kebbi State, Nigeria: A Case for Sheabutter".

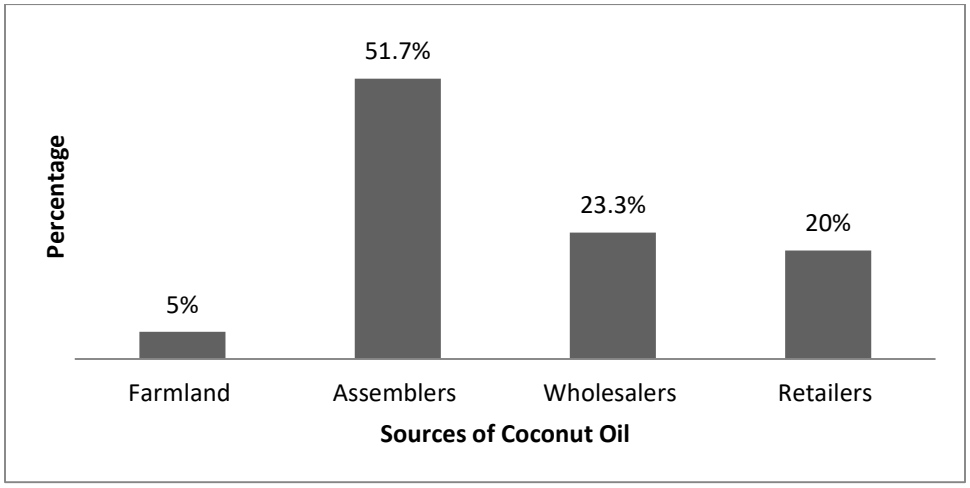

Figure 2: Pictorial presentation of coconut oil marketing

Distribution of Respondents on how they disposed their Products

From Table 3 above, majority of the respondents (54.2%) sold their product to individual consumers. This findings was in line with the findings of Senchi and Lukman (2017) who indicated that, 58.8% of their respondents dispose their sheabutter to consumers in their research, "Productivity of Non Timber Forest Products (NTFPs) Production and Marketing in Zuru Local Government Area, Kebbi State, Nigeria: A Case for Sheabutter". while, (2.5%) of the repondents sold to wholesalers. product from farmland where farmers conserved the stands of *Coccos nucifera* trees as the means of agroforestry.

Table 3: Distribution of Respondents on how they disposed their Products

Marketing of Product	Frequency	Percent
Wholesalers	3	2.5
Middle men	12	10.0
Agents	28	23.3
Retailers	12	10.0
Consumer	65	54.2
Total	**120**	**100.0**

Profitability of Coconut oil Marketers

Profitability refers to the gains a person makes in the business in relation to its expenses. Majority of the respondent venture into coconut products marketing to earn income, increase their standard of living and able to withstand other expenses in the community.

Average Cost and Return of Coconut Oil Marketers per Month

Average Rate of Return is a financial metric used to measure the profit or loss of an investment over a specified period, expressed as a percentage of the initial investment cost (Berrada, 2022). The findings in table (4) indicated that, labour and pots (38.5% and 31.5%) among the variable and fixed cost items (₦23,250.00 and ₦5,550.00) had the highest contribution in coconut oil business. This finding was agreed with that of Senchi and Yakubu (2014) who indicated that, 38.5% of

labour was the highest contributing cost in processing of sheabutter, though, with a net profit of ₦33,150 in their research, "Assessment of Processors and Marketers of Sheabutter (*Vitellaria paradoxa* C. F. GAERTN.) in Zuru Local Government Area, Kebbi State. The total cost (TC) incurred in the business was ₦76,850.00, total variable cost (TVC) was estimated at ₦60,350.00 (78.5%) of the total cost (TC) in coconut oil business. This finding was in line with the findings of Okpara *et al*., (2023) who reported that, 75.1% was incurred in the total variable cost among the palm oil marketers in their research, "Analysis of Palm Oil Marketing among Women Marketers in Umuahia Agricultural Zone, Abia State". The total revenue indicated ₦130,550.00 while the net profit earned in the marketing was ₦53,700.00 per month, this was supported by Okpara *et al*., (2023) who observed that, ₦94,440.50 was earned as their total revenue in palm oil marketing. The results also revealed that, return on investment (ROI) represents 41.13% indicating that, coconut oil business is a profitable venture. For this, marketing of NTFPs have great potentials for increasing the income and improving the lives of people in Chikun Local Government Area.

Table 4: Average Cost and Return of Coconut Oil Marketers per Month

	Cost Items	Amounts (₦)	Average Cost	Percent
A	**Variable Cost (VC)**			
	Cost of labour	23,250	193.75	38.5
	Harvesting	9,500	79.17	15.7
	Cost of transportation	11,500	95.83	19.1
	Fuelwood	8,300	69.17	13.8
	Other expenditure	7,800	65.00	12.9
B	**Total Variable Cost (TVC)**	**60,350**	**502.92**	**100**
				78.5
C	**Fixed Cost (FC)**			
	Bowls	5,200	43.33	31.52
	Pots	5,550	46.25	33.64
	Gallons/Bottles	3500	29.17	21.21
	Cutlass	2,250	18.75	13.64
	Total Fixed Cost (TFC)	**16,500**	**137.5**	**100**
				21.5
	Total Cost (TVC+TFC)	**76,850**		**100**
D	**Total Revenue (TR)**	**130,550**		
E	**Gross Profit Margin (GM=TR -- TC)**	**53,700**		
F	**Return On Investment (ROI=Profit/TR X 100)**	**41.13%**		

Constraints Encountered in the Processing and Marketing of Coconut Oil

The results revealed cost of labour (46.2%) as the most important constraint in the coconut oil business. This is could be attributed to labour intensive in the processing of coconut oil before making it readily available for the marketers. This findings was in line with the findings of Senchi and Lukman (2017) who indicated that, 42.1% of the respondents' mention labour as their major constraints in their research, "Productivity of Non Timber Forest Products (NTFPs) Production and Marketing in Zuru Local Government Area, Kebbi State, Nigeria: A Case for Sheabutter". Secondly, transportation recorded 19.5% among the constraints encountered, this could be due to potholes or bad roads in the area since most of the roads are in the state of disrepair. The least percentage was recorded in cost of harvesting and price fluctuation with 11.2% as well as 10.1% respectively.

Table 5: Constraints Encountered in the Processing and Marketing of Coconut Oil

Category	*Frequency	Percent
Cost of Labour	78	46.2
Lack of capital	22	13.0
Cost of harvesting	19	11.2
Transportation	33	19.5
Price fluctuation	17	10.1
Total	**169**	**100.0**

**Multiple responses*

Conclusion and Recommendations

From the findings of the study, it was apparent that women are major actors in coconut oil business in the area, age between 41- 50 years, mostly married with household size of 6-10 members. Majority had secondary school education with 6-10 years of processing and marketing experience in coconut oil business. The research showed that, coconut oil business is profitable with 41.13% return on investment, although, labour, transportation cost and lack of capital are the major constraints in coconut oil business. Conclusively, coconut oil business in Chikun local government area is a profitable business. It is recommended that, development of new techniques and equipments to simplify the processing of coconut oil business should be adopted.

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