Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development
Vol. 24, Issue 1, 2024
PRINT ISSN 2284-7995, E-ISSN 2285-3952

ECONOMIC ANALYSIS OF OIL PALM PROCESSING IN OLA OLUWA LOCAL GOVERNMENT AREA, OSUN STATE, NIGERIA

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Abstract

The study investigated the profitability of oil palm processing venture in Ola Oluwa Local Government Area of Osun State, Nigeria. The sampled 120 respondents for the study were selected using a multistage sampling procedure. Field surveys were carried out using structured interview schedule to obtain primary data utilized for the study. Data analysis was carried out using frequencies, percentages, means, and regression analysis. Results of the descriptive analysis revealed that the majority of the respondents were middle-aged (mean = 58.43 years) (92.5%), married (55.83%), female (100%), having a mean of the household size of 5 persons per household. The majority (60.00%) of the respondents had no formal education; do not own an oil palm processing unit (77.31%); small-scale processors (44.54%), with a mean of 37.21 litres of palm oil per production cycle. The mean years of oil palm processing experience, total revenue, total production cost, gross margin, and net income from oil palm processing per year were 28.39 years, ₦243,472.900, ₦103,088.808, ₦155,521.592 and ₦140,384.092 respectively. Regression results revealed that the cost of oil palm bunches, the cost of firewood, the cost of kerosene, and matches, and the cost grinding were positive significant determinants of the level of gross margin from oil palm processing in the study area. Based on the findings, the study concluded that despite the profitability oil palm processing venture in the study area, it is operated on a small-scale predominantly by aged married and widowed women; hence provision of financial assistance through low-interest loans from agricultural banks or any other related financial institution would help improve their productivity.

Key words**:** *Oil palm, Oil palm processor, small scale oil processing, gross margin, palm bunches cost*

INTRODUCTION

The oil palm is of significant economic value globally, its production and yield per unit area have increased in recent times as a result of surging demand for palm oil in the global market [6].

Oil palm (*Elaeis guineensis*), a tree crop, is of immense economic importance in the economy of Nigeria. It is a monocotyledonous plant, and a member of the palm family known as *Arecaceae*. There are about 225 genera with over 2,600 species. A monoecious species, producing unisexual male and female inflorescences alternately, with a better performance in humid tropics [12].

Palm oil production involves the extraction of the oil from oil palm fruit fleshy mesocarp.

Also, palm oil extracted from coconut palm, a different species of oil palm is used in production of palm sugar which is combined with mulberry leaf to serve as an energy source in the production of silkworms in Indonesia [13].

Globally, Nigeria is ranked as one of the topmost producers of palm oil. The commodity is an essential commodity in the

diet of human and livestock, as well as in production of others products.

Palm oil could bring important revenues to farmers. Over 70% of crude palm oil produced in Nigeria is not refined before consumption. Crude palm oil is utilized in various food recipes, including frying [7].

The continuous increase in global consumption of palm oil as result of population explosion has created a serious deficit in supply relative to demand [3].

Oil palm processing is made up of series of activities and operation which include: harvesting and reception of bunches, removal of oil palm fruits from the bunches, sterilization of the fruits harvested from oil palm , mashing of the fruits from oil palm to extract the oil containing fibres from the kernels, heating to extract the oil from the fibres using an oil seed expeller, clarification using a filter press using the principle of sedimentation, and final storage of the extracted oil in 25 litres capacity plastic kegs or 200 litres capacity drums [3] and [12].

Oil palm value chain is a steady source of income for all actors in the chain. Palm oil and other derivatives from oil palm processing are indispensable raw material for food and agro-allied industries, thus indirectly providing employment for the teeming population. Annually, palm oil is consumed in large volume in Nigeria. Statistically, in 2018, about 1.34 x 10^6 metric tonnes of palm oil was reported to be consumed [2] and [3]. Before independence, Nigeria is the leading global producer of palm oil, with the export of the commodity contributing significantly to revenue from agricultural exports [3].

The discovery of crude petroleum in the early part of 1970, and its subsequent export led to massive influx of foreign exchange earnings which led to serious neglect of the agricultural export sector by the government. This phenomenon is known as "Dutch disease". The aftermath of this government action is a serious decline in the production and productivity of agricultural export commodities, including palm oil. Subsequently, Nigeria lost her leadership in global production of palm oil to other countries such as Malaysia and Indonesia. This situation created a serious supply-demand deficit, thus the country had to retort to palm oil importation to augment local production to meet rising demand [4] and [5].

Import of palm oil affects internal producers and supply, but export ahs to be encouraged to bring foreign currency in the country [11].

Recently, Indonesia, the world largest oil palm and palm oil producer stopped the export of crude palm oil and its derivatives to other nations across the globe. This created a huge pressure on domestic production and consumption in Nigeria. However, this scenario resulted in the creation of a huge opportunities in palm production and processing, especially for countries with huge potential in the two areas, including Nigeria. Currently, in the global market, a barrel of crude palm oil is sold at a higher price than a barrel of crude oil, giving Nigeria a massive opportunities to improve her revenue from increased foreign exchange earnings from palm oil exports and other derivatives. The Central Bank of Nigeria (CBN) is currently pursuing a policy of reviving the agro-business sector's oil palm sub-sector in Nigeria. The intervention of CBN in the oil palm value chain, is timely as it is aimed at increasing oil palm production from 1,250,000 metric tonnes in 2021 to 2,500,000 metric tonnes by 2028 by expanding land area under oil palm production to approximately 350,000 hectares. The specific objectives of the CBN policy are to satisfy local demand for palm oil and its derivatives, improve local processing quality and standards; conserve foreign exchange reserves; create jobs and enhance the skills of Nigerian people along the oil palm value chain; facilitate easier access to funding for palm oil majors, Small and Medium Enterprises (SMEs), and smallholders in a way that will improve economic growth [8].

There are different techniques used in processing of agricultural commodities including palm oil and these range from climate change resilient modern methods to traditional methods [1]. However, the traditional method of processing is more prevalent among small scale processors and these small scale processors are responsible

for the bulk of palm oil processed in Nigeria [9].

Presently, a myriad of problems have affected the oil palm processing sub-sector; incomplete and obsolete processing facilities, sole reliant small scale processors, land fragmentation induced by land tenure system, dilapidating infrastructure, and dearth of financial facilities for the processors [10] and [3]. The production and productivity of the oil palm processing sub-sector have been retarded by these problems, with negative consequences on profitability of this sub-sector.

Consequently, the study investigated the profitability of oil palm processing venture in Ola Oluwa Local Government Area of Osun State, Nigeria. The specific objectives of the study is to examine the socio-economic characteristics of the oil palm processors, examine their level of oil palm processing, evaluate the profitability of oil palm processing among the processors, determine significant factors affecting the profitability of oil palm processing venture, and constraints to oil palm processing in the study area.

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MATERIALS AND METHODS

The study was carried out Ola Oluwa Local Government, Osun State, Nigeria. The local government is located in Osun State, a state in the South Western part of Nigeria. The area has a high population of oil palm processors due to abundance of oil palm trees. The sampled 120 respondents for the study were selected using a multistage sampling procedure. The first stage involved the selection 10 oil palm processing communities were randomly selected from oil processing clusters in the local government area. In the second stage, 5 villages with the highest oil palm processing clusters were randomly selected from the 10 communities. In the final stage, 25 oil palm processors were randomly selected from the 5 villages to make 125 oil palm processors as sample for the study.

Primary data was used for the study. Primary data was collected through field survey using structured interview schedule. Data was collected on the following:

(i)Socio-economic variables such as age of the respondents, sex, household size, family size, education level, marital status, income and oil palm processing experience.

(ii)Oil palm processing variables such as amount of oil palm bunches harvested (nos), labour utilization (man-day) total output obtained, costs of inputs, product(s) price(s), marketing costs and returns.

Data analysis

Data collected was analysed with both descriptive and inferential statistics. The descriptive statistical tools that were employed in the study include means, percentages and frequency counts. These will be used to examine the socio-economic characteristics of the oil palm processors. The profitability of the oil palm processing was determined using the budgetary analysis. The major inferential statistical tool employed in the study is the multiple regression analysis which is used to determine significant factors affecting profitability of oil palm processing venture in the study area. The implicit regression model that was used for the study is stated as:

$$Y = f(X_1, X_2, X_3, X_4, X_5 \text{ and } E_t) \text{ ----------(1)}$$

where:
Y is gross margin from oil palm processing
$X_1$is cost of palm bunches in Naira
X_2 is costs of variable inputs in Naira
X_3 is costs of labour in Naira
X_4 is the fixed cost (renting) in Naira
X_5 is levies paid in Naira
X_6 is oil palm processing experience in years
X_7 is household size
E_t is the random error term.

RESULTS AND DISCUSSIONS

Socio-economic characteristics of the oil palm processors

One of the study specific objectives is to examine socio-economic related characteristics of the oil palm processors in the study area. These characteristics include age, gender, marital status, household size, years of formal education, ownership of the oil palm processing unit, and oil palm

processing experience. The descriptive analysis results are presented in Table 1.

The distribution of the oil palm processors based on their age is shown in Table 1. The Table reveals that virtually all (92.50%) of the oil palm processors falls within the age range of 41-80 years, with an average of 58.43 years. This implies that the respondents are still in their economically active age which may influence their level of profitability in the study area.

Similarly, gender distribution of the sampled oil palm processors is presented in Table 1. The Table shows that virtually all (100.00%) of the oil palm processors were female, implying that the venture is dominated by the female gender in the study area.

Also, the marital status distribution of the oil palm processors is presented in Table 1. Data in the Table reveals that majority (55.83%) of the oil palm processors were married, while minority (44.17%) of them have lost their husbands (widowed).

In the same way, household size distribution of the oil palm processors is shown in Table 1. Virtually all (93.34%) of the oil palm processors had between 1-10 persons in their households, with an average of 5 persons per household. This may be connected to family labour supply required by the venture in the study area.

In addition, the years of formal education distribution of the sampled oil palm processors is shown in Table 1. The Table reveals that most (70.00%) of the oil palm processors had between 4-8 years of formal education, while few (30.00%) of the respondents had between had between 9-16 years of formal education, with a mean of 5 years, reflecting the significance of formal education in oil palm processing venture in the study area.

Furthermore, the distribution of the oil palm processors according to their ownership of assets used in palm oil production is shown in Table 1. The Table reveals that most (77.31 %) of the oil palm processors do not individually own oil palm processing units, however few (22.69%) of the oil palm processors owned their oil palm processing units. This situation may be attributed their financial incapability to purchase their own processing units.

Finally, Table 1 shows the distribution of the oil palm processors based on their oil palm processing experience. Results from the Table shows that almost all (85.83%) of the processors had been engaged in oil palm processing for about 2-40 years, while, a few (14.17%) had been involved in oil palm processing for about 41-60 years. The mean years of oil palm processing experience of the oil palm processors is 28.39 years, suggesting that the oil palm processors in the study area were highly experienced.

Table 1. Socio-economic characteristics of the oil palm processors

Socio-economic characteristics (n=120)	Frequency	Percentage (%)
Age		
30-40	9	7.50
41-50	38	31.67
51-60	25	20.83
61-70	29	24.17
71-80	19	15.80
Mean age = 58.43 Years		
Gender		
Male	0	0.00
Female	120	100.00
Marital status		
Single	0	0.00
Married	67	55.83
Separated	0	0.00
Widowed	53	44.17
Household size		
1-5	68	56.67
6-10	44	36.67
11-15	8	6.67
Mean = 5 person per household		
Years of formal education		
0-4	62	51.67
5-8	22	18.33
9-12	35	29.17
13-16	1	0.83
Mean = 5 years		
Ownership of oil palm processing unit		
Owned	27	22.69
Not owned	93	77.31
Years of oil palm processing		
2-20	66	55.00
21-40	37	30.83
41-60	17	14.17
Mean = 28.39 years		

Source: Field Survey, 2023.

Respondents' level of oil palm processing

Results in Table 2 reveals oil palm processing level among the respondents. The data reveals that most (79.17%) of the oil palm processors' level of palm oil production ranges from 25-

39 litres, with few (20.83%) of them producing between 40-54 litres of palm oil. The average palm oil production among the respondents stood at 37.21 litres, suggesting that most of the oil palm processors in the study area operates at small scale level.

Table 2. Respondents' level of oil palm processing

Level of oil palm processing (litres)	Frequency	%
25-29	11	9.17
30-34	31	25.83
35-39	53	44.17
40-44	7	5.83
45-49	3	2.50
50-54	15	12.50
Total	120	100

Mean = 37.21 litres
Source: Field Survey, 2023.

Budgetary analysis

Table 3. Annual Cost and Return Analysis per oil palm processor

S /N	Item	Amount (₦)	Scale
A	Revenue (TR)	243,472.900	
B	Variable Cost		% of TVC
	Cost of oil palm bunches	9,748.167	11.084
	Cost of water	4,377.731	4.977
	Cost of fire wood	31,862.500	36.227
	Cost of matches and kerosene	1,292.083	1.470
	Cost of grinding	6,874.167	7.816
	Miscellaneous expenses	15,308.330	17.405
	Cost of labour	18,488.330	21.021
C	Total variable cost (TVC)	87,951.308	100
D	Gross margin (TR-TVC)	155, 521.592	
E	Cost of fixed assets	15,137.500	
F	Total production cost= B+E	103,088.808	
G	Net oil palm processing income	140,384.092	

Source: Field Survey 2023.

The cost and returns associated with oil palm processing among the respondents is shown in Table 3.

Budgetary analysis results from the Table reveals that the fixed asset cost is ₦15,137.500, while that of the total variable cost is ₦87,951.308, and the total revenue is ₦243,472.900.

The result further revealed that on the average, a processor realized a net oil palm processing income of ₦140,384.092 per annum. The results revealed that oil palm processing is a profitable enterprise in the study area.

Regression analysis results

The regression analysis results indicating significant factors affecting the gross margin of the oil palm processors in the study area is presented in Table 4.

The adjusted R-squared is 0.486 and the F-value (12.46) is significant at 1% level, showing that the model has a good fit.

The coefficient of cost of oil palm bunches (X_1) and cost of grinding (X_5) is positive and is statistically significant at 1% level, implying that a positive relationship between these variables and the level of gross margin from palm oil production in the study area.

In the same way, the coefficients of cost of kerosene and matches (X_4) and cost of firewood (X_3) are positive and statistically significant at 5% and 10% level respectively; showing that these variables are directly related with the oil palm processors' gross margin level in the study area.

Table 4. Regression analysis results

Variable	Coefficient	Standard error	t-value	Probability
Cost of palm bunches (X_1)	5.319	0.918	5.790	0.000*
Cost of water (X_2)	2.348	3.918	0.600	0.550
Cost of fire wood (X_3)	-2.032	1.235	-1.650	0.103***
Cost of matches and kerosene (X_4)	31.556	14.788	2.130	0.035**
Cost of grinding (X_5)	20.044	4.552	4.400	0.000*
Cost of labour (X_6)	-1.087	0.898	-1.210	0.228
Fixed costs (X_7)	0.764	1.089	0.700	0.484
House hold size (X_8)	94.942	1436.194	0.070	0.947
Oil palm processing experience (X_9)	20.851	23.302	0.089	0.373
Constant	-18.265	21.243	-0.860	0.392

R-squared = 0.507, Adj R-squared = 0.486, F value = 12.46
*significant at 1% level, **significant at 5% level, ***significant at 10% level
Source: Data Analysis, 2023.

CONCLUSIONS

From the study findings, it is concluded that oil palm processing, a profitable business venture dominated by the female gender who are married is operated on small-scale in the study area.

Based on these findings of the study, it is suggested that financial facilities such as credit and low interest loans facilitated by agricultural banks or any other related financial institution should be made accessible to the oil palm processors for the procurement of oil palm processing assets which would improve their scale of production and their standard of living.

Also, oil palm processors should be encourage to organise themselves into cooperative societies in order to secure credit facilities for better production technology and market access.

Finally, since the processors are mostly aged married and widowed women, there is need to empower them through vocational training to sustain them during the off season period.

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