

ECONOMICS OF OIL PALM PRODUCTION: EVIDENCE FROM ONDO STATE, NIGERIA

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ABSTRACT

The study analysed the economics of oil palm production in Ondo State, Nigeria. Primary data were employed with the use of structured questionnaire to elicit information from oil palm producers in the study area. Multi-stage sampling procedure was employed to select 128 oil palm producers for this study. Data collected were analysed using descriptive and gross margin analysis. The result shows that majority of the oil palm producers were males, married, well experienced, and educated in the study area. The result shows majority of the farmers operate on a small scale due the farm size of 1.3 hectares. The results also revealed that average gross margin was estimated to be ₦46,730 per hectare. The return to naira invested was found to be 0.57kobo. This implies that for each 1naira invested in oil palm production business ₦1.57 was obtained. The major constraint associated with oil palm production was unfavourable climatic condition which affected the yield of oil palm producers in the study area. This study concludes that the production of oil palm in study area was a profitable venture, even though the producers ability to expand and reduce palm oil deficit is limited by several bottlenecks. The study recommends strengthening producers groups and improving extension services by Government and Non-governmental organization to support modern practices. Investment in climate based technologies by Government and private investors to improve poor weather conditions.

Keywords: profitability, farm enterprise, and producers

<https://dx.doi.org/10.4314/jafs.v24i1.1>

INTRODUCTION

The oil palm botanically known as *Elaeis guineensis* is said to have emerged from tropical biome in West African. It is still grown there, as well as in other tropical areas. Palm oil is one of the two most important products of the oil palm, other product is palm kernel seed. Palm oil from *Elaeis guineensis* has in recent years emerged as the world's most important vegetable

oil that accounts for over 35% of global productivity of edible/industrial fat and hold a key position in the world's market. (Alhaji et al., 2024). The global output of palm oil has skyrocketed over the past 30 years, largely on the back of Southeast Asia, where Malaysia and Indonesia have been aggressively expanding their oil palm plantations. Indonesia, with 41.5 million metric tonnes, was the world's leading producer of palm oil, followed by Malaysia with 39.5 million metric tonnes. Together, these two countries accounted for an average of 80.1% of global production between 2016 and 2018. Thailand produced 2.9 million metric tonnes, while Colombia produced 1.5 million metric tonnes. Nigeria ranked as the fifth-largest producer, with close to 1.0 million metric tonnes, attributing to 7% of global output (Uchua, 2020). Nigeria's oil palm belt covers 24 states, including all nine states of the Niger Delta. The Niger Delta states alone contribute about 57% of total national production. Almost 80% of Nigeria's palm oil comes from smallholders who grow semi-wild plants and prepare them by hand. Several million small farmers grow oil palms on land with mean of about 2.85 million hectares, but no more than 3 million hectares (Sibhatu, 2023).

Global consumption of palm oil has expanded significantly, driven by rising global incomes, affordability, and its versatile uses compared to other crops. Nigeria was once the world's largest producer of palm oil, before the crude oil boom, but Malaysia has since taken the lead. The top producing states include Edo, Bayelsa, Delta, Ondo, Anambra, Abia, Ebonyi, Imo, Akwa-Ibom and Cross River. Along with Oyo, Ogun, and Ekiti, these states make up the major palm oil-producing areas of Nigeria (Oladiti et al., 2024). Oil palm cultivation in Ondo State plays a central role in rural and semi-urban economies, serving as a major livelihood source for households in Ikale and Ilaje communities where palm oil, palm kernel oil, palm wine, brooms, and traditional soap are widely produced and traded.

Despite its potential, Nigeria's palm oil production has not met domestic consumption since 1990. Oil palm cultivation in Ondo State is central to rural and semi-urban livelihoods, particularly among households in the Ikale and Ilaje communities, where palm oil, palm kernel oil, palm wine, brooms, and traditional soap are widely produced and marketed. The state also hosts three major oil palm industries: Okitipupa oil palm company, Ayesan oil palm private limited company, and Irele oil Palm Company, alongside many smallholder farmers cultivating improved varieties of oil palm seeds (Erinoso et al., 2020). Despite this, Nigeria has struggled to meet domestic demand for palm oil since 1990. Rising global incomes, affordability, and the diverse applications of palm oil have fueled rapid growth in global consumption. Nigeria was once the world's largest producer of palm oil, before the crude oil boom, but Malaysia has since taken the lead (Oladiti et al., 2024).

Because local output remains insufficient, imports have become necessary to close the supply gap, conflicting with federal policy objectives. Consumption has steadily outstripped production, with the shortfall reaching an estimated 1.42 million metric tonnes in 2018. That year, domestic demand was 2.4 million metric tonnes, while production stood at only 980,000 metric tonnes. Between 2014 and 2019, the country spent roughly USD 1.4 billion on imports (Shehu et al., 2021). Although Ondo State is a leading producer within Nigeria, production there remains largely small-scale and underdeveloped. Examining the production system is

therefore crucial to identify the economic opportunities available to current and prospective farmers in the state.

Objectives of the study

The main objective of this study was to analyse oil palm oil production in Ondo State, Nigeria, while the specific were to:

- 3 describe the socio-economic characteristics of oil palm producers,
- 4 estimate the cost and returns from oil palm production,
- 5 identify the constraints associated with oil palm production in the study area.

METHODOLOGY

Study Area

The research area was situated in Ondo State, Nigeria. Ondo State is located between 5°45' and 8°15' North of the equator and 4°45' and 6°60' East of the Greenwich meridian. Ekiti State is to the northwest, Osun State is to the west-central, Ogun State is to the southeast, Delta State is to the south-east, and the Atlantic Ocean is to the south. Ondo State experiences the two season common in the region which are rainy and dry seasons respectively, the period of April to October forms the rainy period while November to March is the period of Dry spells. There are periods where variations are experience in the seasons on a yearly basis. The average temperature is 27°C, with highs of 30°C and lows of 24°C. Ondo State is estimated to cover about 15,500 km² area and the population of 3,460,877, with annual estimated growth rate of 3.2%, the forecasted increase in 2026 is around 11,074,806 (NPC, 2006). The average humidity is about 73%. The capital of Ondo State, which was formed on February 3, 1976, is Akure. The Yoruba people make up most of the population who live in the state. The state has a lot of plants that help grow a wide range of crops, such as cashew, palm produce, kola nut, timber, maize, yam, plantain, cocoyam, cassava, and banana. Based on an early study from 2009, about 16,200 hectares were under large property holdings, 10,100 hectares were under small and medium holdings, and about 85,000 hectares were in wild groves (Omoti, 2009). From 2008 to 2017, NIFOR sent seeds to Ondo State, which led to the planting of an extra 4,286 hectares of better plants between 2009 and 2018. People who live in the study region still work in agriculture as their main job.

Sampling Procedure

Multi-stage sampling procedure was employed to select oil palm producers for this study. First stage, involved the purposive selection of two (2) local government areas namely Okitipupa and Ifedore, due to the high concentration of producers within the areas. Second stage involved the random selection of two communities each from the selected local government areas which are, Ilu-titun, Ode –aye, Igbara-oke, Isarun, respectively. Stage three involved the random sampling of producers across the four communities based on the sampling frame of oil palm producers as shown in Table 1. The sampling frame of oil palm producers was sourced from Agricultural Development Programme (ADP) office within the state, while raosoft online sample size calculator was used to estimate the sample size.

Data Collection Method

Data were obtained through primary sources. The primary data were employed through personal interview, focus group discussion, with a structured questionnaire to gather information from the selected oil palm producers in the study area. Data collected includes; quantity of oil produced, marketed, market prices for inputs and outputs, as well as associated constraints faced by producers.

Data Analysis and model specification

Descriptive statistics and Gross margin Analysis (GMA) were used to analyze data collected in the study.

Model Specification

The socioeconomic characteristic and constraints of the oil palm producers in the study area were analyzed descriptively using frequency, percentage measure of central tendency, charts and tables.

According to Olukosi and Erhabor, (1989) Gross margin is the estimate obtained when the difference between gross income and total variable cost are calculated. Gross margin analysis was used to determine the cost and returns of oil production. Gross margin was adopted due to the fact that fixed cost is not significant for small-scale farmers in the research area.

$$GM = GI - TVC \dots\dots\dots (i)$$

where;

GM = Gross margin (₦/ha)

GI= Gross income (Revenue received from sales of oil palm)

TVC= Total variable cost (cost of production inputs and labour employed in production)

Oil Palm Production

$$\sum PX_i \cdot K = (PX_1 \cdot K_1 + PX_2 \cdot K_2 \dots\dots\dots PX_7 \cdot K_6) \dots\dots\dots (ii)$$

Where,

PX₁= unit cost of seedlings (₦/ha), K₁= Quantity of seedlings (ha)

PX₂= Unit cost of fertilizer (₦/ha), K₂= Quantity of fertilizer (kg)

PX₃= unit cost of seed (₦/ha), K₃= Quantity of seed (kg)

PX₄= unit of herbicide (₦/litres), K₄= quantity of herbicide (litre)

PX₅= unit cost of pesticide (₦/litre), K₅= quantity of pesticide (litre)

PX₆= unit cost of labour (₦/manday), K₆= amount of labour (manday)

P X₇= Unit cost of value addition activities (₦/manday), K₇= Quantity of value added (mandays)

RESULT AND DISCUSSION

Socio-Economic Characteristics of Oil Palm Producers in the Study Area

The socio-economic characteristics of producers were captured and presented in Tables 2 and 3. The age distribution of the producers were presented in Table 2. The results reveal that most (28.10%) of the oil palm producers were between the age range of 30–41 years, while 10.9% were between 66–77 years, with a mean age of 45 years. This implies that the oil palm producers are in their active productive age. These results agree with Egwu et al. (2023), where they discovered that oil palm producer were in the middle age which enables them to engage in plantation activities.

The results further show that most (40.6%) of the oil palm producers had been engaged in production for about 10–18 years, while 35.9% had 19–27 years of experience, with a mean of 14 years. This indicates that they had vast experience in oil production. The results also show that the mean household size of the oil palm producers was 5 persons, while most (29.7%) had a household size of 3–4 persons. This implies that they had relatively large household sizes, which could serve as family labour. This finding agrees with Eze et al. (2023), where they observed that in many cases, family members work without pay in palm oil production which helps boost output. The results shows that most (50.0%) of the oil palm producers had farm sizes ranging from 0.40–1.39 hectares, while 28.1% had 1.4–2.3 hectares and a mean of 1.7 hectares. This implies that they were small scale producers in the study area. This finding is in agreement with Igboresze (2024), who discovered that the mean farm size of oil palm producers was above one hectare in Edo State, Nigeria.

This report in Table 3 indicates that most (79.7%) of the oil palm producers were males while (20.3%) were females in the study area which indicated that oil production was a male dominated enterprise in the study area. This agrees with Alabi *et al.* (2020) where he observed that majority of oil palm producers in Ondo State, Nigeria were males. The result shows that most (68.8%) of the oil palm producers were married, (18.8%) were single, while (3%) were widowed in the study area. This shows that most of oil palm producers were married. The result shows that most (68.8%) of the oil palm producers had secondary education while (7.8%) have tertiary education. This implies that most producers in the study area have formal education. Formal education might influence decision making and adoption of new innovation on oil palm production. The result indicates that most (57.8%) of the producers do not belong to cooperative societies while (42.2%) of them belong to cooperatives societies. This implies that most producers do not belong to cooperative societies which could influence social interaction in the study location. The result indicates that majority (84.4%) of the producers had contact with extension agents, while (15.4%) of them had no contact with extension agents in the study area. This finding is contrary with Igboresze (2024) where she observed that most of the oil palm producers in Edo State, Nigeria do not had contact with extension agent.

Cost and Returns from Oil palm Production in the Study Area

Table 4 presents the costs and returns from oil palm production. The results revealed that total input costs incurred of oil palm seeds, fertilizer and agro-chemicals was ₦58,870 per hectare, and makes up 69.96% of the overall production costs. The amount spent on labour was ₦22,000

per hectare and accounts for 27.07% of the total cost of production. The cost incurred on the transportation of farm produce for one hectare was ₦2,400 and constitutes 2.96% of the total variable cost of production in the study area. The result also shows that the total variable cost (TVC) incurred per hectare was estimated to be ₦81,270 in the study area. The average yield realized for one hectare of land in oil palm production was 16 bags (800kg) of palm fruits. The average price per kg bag of palm fruit in the study area was estimated to be ₦160. The results also revealed that average gross margin was estimated to be 46,730 per hectare. The return to naira invested was found to be 0.57. This implies that for each ₦1 invested in oil palm production business ₦1.57 was obtained. The result shows that production of oil palm fruits is a profitable venture. The finding is in agreement with Igbozore (2024) who discovered that oil production was a profitable enterprise in Edo State, Nigeria.

Constraints associated with oil palm production in the Study Area

Table 5 presents the constraints encountered by oil palm producers. The result shows that unfavorable climatic condition was ranked first among the major constraints faced by oil palm producers in the study area. The issue related to climate was due to weather fluctuation especially during the harmattan period, oil palm production needs high level of cold weather conditions, thus the more intense the harmattan the higher the outputs. The issue of inadequate farm tools to carry out most of the farming activities was the least constraint experienced. The finding is in agreement with Oyebo et al. (2021) who discovered that the changes in climatic conditions, inadequate finance, and poor yield were among the issues that cause disruption among oil palm enterprise in Ondo State, Nigeria.

CONCLUSION

The study concludes that the production of oil palm in study area is a profitable enterprise, largely managed by experienced, middle-aged male smallholders. Fertilizer and labor account for the bulk of production costs, but overall returns remain high enough to make the venture worth it in the study area. Even though the enterprise ability to expand and reduce palm oil deficit is limited by challenges such as unpredictable weather, rising input costs, and poor access to financial services.

The study recommends strengthening producers groups and improving extension services by Government and Non-governmental organization to support modern practices. Investment in climate smart practices by Government and private investors to improve poor weather conditions. Promotion of programs by Non-governmental organization and Agricultural development programmes (ADP) to enhance more participation of women and youth in the study area.

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Table 1: Summary Table for Sampling of Oil palm Producers

Producers	Local Government Area	Specified Area	study	Sampling frame	Sample size
Producers	Okitipupa	Ilu-titun		42	34
		Ode-aye		60	32
	Ifedore	Igbara-oke		26	22
		Isarun		54	42
Total				162	128

Source: Field Survey, 2021

Table 2: Age, Farming Experience, Household Size and Farm Size of Oil Palm Producers (n=128)

Variables	Frequency	Percentages (%)	Minimum	Maximum	Mean	Standard deviation
Age (Years)						
18-29	20	15.6	18.00	72.00	45.00	14.3
30-41	36	28.1				
42-53	30	23.4				
54-65	28	21.9				
66-77	14	10.9				
Farming Experience (Years)						
1-9	46	35.9	1.00	42.00	14.00	10.50
10-18	52	40.6				
19-27	16)	12.5				
28-36	8	6.2				
37-45	6	4.7				
Household Size (Persons)						
1-2	28	21.9	1.00	9.00	5.00	2.30
3-4	38	29.7				
5-6	34	26.6				
7-8	20	15.6				
9-10	8	6.2				
Farm size(ha)						
0.40-1.39	64	50.0	0.40	5.00	1.70	1.22
1.40-2.39	36	28.1				
2.40-3.39	10	7.8				
3.40-4.39	12	9.4				
4.40-5.39	6	4.7				

Source: Field Survey, 2021

Table 3: Sex, marital status, Education, member of cooperatives, contact with extension agent, and Land ownership of oil palm producers (n=128)

Variables	Frequency	Percentages (%)
Sex		
Female	26	20.3
Male	102	79.7
Highest Level of Education		
Primary school	30	23.4
Secondary school	88	68.8
Tertiary	10	7.8
Member of Cooperatives		
Member	54	42.2
Non-member	74	57.8
Marital Status		
Married	88	68.8
Single	24	18.8
Divorced	10	7.8
Widowed	6	4.7
Contact With Extension Agents		
Contact	108	84.4
No contact	20	15.6
Land Ownership		
Inheritance	48	37.5
Leased	54	42.2
Borrowed	20	15.6
Family owned	6	4.7

Source: Field Survey, 2021

Table 4: Average cost and returns from Oil Palm Production in the study Area (one hectare)

Costs	Quantity	Unit price (₦)	Total cost (₦)	Percentage (%)
Cost of inputs				
Oil palm seeds (kg)	10	400	4,000	4.92
Oil palm seedlings (Stand)	35	380	13,300	16.36
Fertilizer(kg)	100	360	36,000	44.29
Herbicides (litres)	1	1920	1,920	2.36
Pesticides (litres)	1	1650	1650	2.03
Transportation cost(naira)	16	200	2400	2.96
Labour (Mandays)				
Harvesting	5	1,200	6,000	7.38
Cracking of palm fruits bunch (bunch)	120	60	7200	8.86
Separation of fruits from bunch (bunch)	120	40	4,800	5.91
Packaging of palm fruits(sacks)	16	250	4,000	4.92
(A)Total Variable Cost (TVC)/ha			81,270	100
Returns				
Average yield of oil palm (kg/ha)	800	160		
(B) Total Revenue/ha			128,000	
(C) Gross margin/ha (B-A)			46,730	
(D) Operating ratio(A/B)			0.63	
(E)Return on investment (C/A)			0.57	

Source: Field Survey, 2021

Table 5: Constraints associated with oil palm production (n =128)

Constraints	Frequency	Percentage (%)	Ranking
Unfavorable climatic conditions	38	29.7	1 st
Poor yield	22	17.2	2 nd
High cost of transportation	18	14.1	3 rd
Pest and disease infestation	14	10.9	4 th
Inadequate market for produce	10	7.8	5 th
Inadequate credit facilities	12	9.4	6 th
Inadequate extension services	8	6.2	7 th
Inadequate farm tools	6	4.7	8 th

Source: Field Survey, 2021.