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Determinants of poverty and welfare among oil palm processors in Osun state

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Abstract

The study analyzed the determinants of poverty and welfare among oil palm processors in Osun state. The specific objectives were to examine the housing and living conditions of oil palm processors in the study area, study the extent of poverty among oil palm processors in the study area, and determine the factors influencing the welfare of oil palm processors in the study area. Primary data were collected from 160 oil palm processors through purposive and random sampling techniques. Descriptive statistics, FGT measure of poverty, and Tobit regression model were used as analytical tools. The study revealed that about 76.9 percent of the processors were female. Majority (56.875 percent) of the processing households have accommodation of their own. The results of the FGT show that about 93 percent of the respondents were poor with a poverty incidence (P_0) of 0.93125, poverty depth (P_1) of 0.787129 and a poverty severity (P_2) of 0.695926. The Tobit regression model reveal that household size and processing method used contributes positively to the likelihood of being poor and both are significant at 5%. While access to credit, years of processing experience and monthly income contributes negatively to the likelihood of being poor which are all significant at 5%. This study recommends that policies which will reduce household size such as fertility control measures should be the focus upon. Also policy should focus more on providing credit facilities through cooperative societies in other to help them improve their welfare status.

Keywords: Poverty; Welfare; Oil Palm; Processors

1 Introduction

Poverty is an issue of serious concern in all countries of the world at various degrees. Due to the effect of poverty on well-being of man, it has attracted a lot of attention from policy makers, Non-Governmental Organizations (NGOs), philanthropists, politicians, academics, researchers among many others around world. According to Worldbank [1], the new international poverty line is set at \$2.15 using 2017 prices. This means that anyone living on less than \$2.15 a day is considered to be living in extreme poverty. In general, those who are unable to fulfill their minimum nutritional needs due to inadequate income are considered to be poor.

Welfare though not observable could be said to represent the people's standard of living. In theory, household's consumption expenditure on food and education is used as proxy for welfare indicators [2]. Large household size contribute to poor productivity, affecting farmers welfare status, reduces income generation of a household, and reduces the level of development of household. Many households in Nigeria especially in rural areas cannot afford to purchase necessary farm inputs such as fertilizers, pesticides, improved seeds among others, which bring about

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increases in productivity and hence, increases household's income and which will proactively affect the socio-economic wellbeing of household positively [3].

FAO [4] in its report noted that the investment in agriculture and rural areas can play a direct role in rural poverty alleviation. In West and Central Africa, agriculture has continued to play a dominant role in the provision of food, raw materials for industries, employment for the majority, and foreign earnings, which are used in financing development activities particularly the permanent crops. Agriculture is a very important sector of the Nigeria economy contributing about 23.01% to overall Gross Domestic Product (GDP) in Q2 2023 [5].

Despite how much agriculture has contributed to Nigeria's economic growth, about 63% of people living within Nigeria (133 million people) are multidimensionally poor [6]. Considering the government's commitment to reducing poverty, the federal government is promoting the cultivation of agricultural commodities where they possess a comparative advantage. One such commodity is oil palm

Oil palm (*Elaeis guineensis*) is one of the most important economic oil crops in Nigeria. Cultivation of oil palm serves as a means of livelihood for many rural families and indeed the farming culture of millions of people in the country. It is the most important source of oil and produces more oil per hectare than any of the oil producing crops. The primary products of the oil palm are palm oil (from the mesocarp) and palm kernel oil obtained from the kernels (seeds). Palm oil contains carotene, a precursor of vitamin A, a high prized energy vitamin rich food used for cooking in oil producing countries of Africa. Palm oil and palm kernel oil provide raw materials in the manufacture of soaps and detergents, margarine, candle, confectionery, epoxy resins, bakery trade, lubricants, pomades and cosmetics. Other uses include palm kernel cake obtained from the crushing of palm kernel to extract oil.

Several studies have been done on rural poverty and oil palm processing [7:8: 9: 10: 11: 12], however such studies do not consider specifically how oil palm processing affects welfare of the processing household especially in Osun State. This study hopes to fill this research gap by analyzing the determinants of poverty and welfare of oil palm processors in Osun state. The specific objectives are to examine the housing and living conditions of oil palm processors in the study area, study the extent of poverty among them as well as determine the factors influencing their welfare.

Therefore this study will also add to other studies analyzing determinants of poverty and welfare among oil palm processors forming references for future research.

2 Material and methods

The study was conducted in Osun state. Osun state is an island state in south western Nigeria. Its capital is Osogbo. It's bounded in the north by Kwara state, in the east partly by Ekiti state and partly by Ondo state, in the south by Ogun state and in the west by Oyo State. It was created in august 27, 1991 from part of the old Oyo state. The state name is derived from the river Osun, the venerated natural spring that is the manifestation of the Yoruba goddess of the same name. The state consists of thirty (30) Local Government Areas. The major ones being Osogbo, Ifelodun, Ife Central, Ede South and Ilesa East. The major sub ethnic groups in Osun are Ife, Ijesha, Oyo, Ibolu and igbomina of the Yoruba people, although there are also people from other parts of Nigeria

A purposive and random sampling technique was employed in the selection of the sampled processors in the study area using three-stage sampling technique. In the first stage, Three Predominant oil palm producing L.G.As were purposively selected out of the 30 L.G.As contained in the zone based on their relevance in oil palm processing. At the second stage, five (5) farming communities were randomly selected from each of the LGAs from which one hundred and sixty (160) oil palm processors were involved in the study at the third stage. Data were collected through the use of well-structured questionnaire augmented with personal oral interview.

Most of the data were presented in tabular and descriptive forms. Descriptive statistics such as frequency counts and percentages was used to describe the socio-economic characteristics of the respondent and their housing and living conditions.

The analysis of poverty was based on measure proposed by Foster, Greer and Thorbecke [13]. The use of FGT class of measure requires the definition of poverty line, which was calculated on the basis of disaggregated data on income. The FGT measure was based on a single mathematical formulation as follow:

$$P \propto (y, z) = \frac{1}{N} \sum_{i=1}^q \left(\frac{z-y_i}{z} \right) \dots \dots \dots (1)$$

Where: N = total number of households in population

q = the number of poor household

Z = the poverty line (\$2 equivalent to N700 Nigerian currency, at \$1 = N350 exchange rate)

y_i = adult equivalent expenditure of the i th household.

2.1 Determining the poverty index

When $\alpha = 0$ in FGT, the expression becomes:

$$P_0 = \frac{q}{N} \dots \dots \dots (2)$$

This is called the Incidence of poverty or headcount index, which measures the proportion of the population that is poor i.e. falls below the poverty line.

When $\alpha = 1$ in FGT, the expression becomes:

$$P_1 = \frac{1}{N} \sum_{i=1}^q \left(\frac{z - y_i}{z} \right) \dots \dots \dots (3)$$

This is called Poverty depth or Poverty gap index, which measures the extent to which individuals fall below the poverty line as a proportion of the poverty line.

When $\alpha = 2$ in FGT, the expression becomes:

$$P_2 = \frac{1}{N} \sum_{i=1}^q \left(\frac{z - y_i}{z} \right)^2 \dots \dots \dots (4)$$

This is called Poverty severity index measures the squares of the poverty gaps used gto the poverty line.

Per- adult equivalent expenditure: Household Expenditure/adult equivalent

Adult equivalent (AE) = $1 + 0.7(N \text{ adult} - 1) + 0.5N\text{children}$

Where;

N adult= number of adult in the household

N children= number of children in the household

The poverty line is a predetermined and well-defined standard of income and value of consumption. The poverty line used is the Dollar Per day poverty line. This measures consider all individuals whose expenditure per day is less than 2.15 dollars per day using the exchange rate of Naira to dollar in 2023. A relative was used in which a household was defined as poor relative to others in the same venture/economy.

Tobit Regression Model was used to determine the factors influencing welfare of Oil Palm processors in the study area. Tobit model is a statistical model proposed by James Tobin in 1958 to describe the relationship between a non negative dependent variable y_i and an independent variable (or vector) x_i . The model suppose that there is a latent (i.e. unobserved) variable y^*_i . This variable linearly depends on x_i via a parameter (vector) β which determines the relationship between the independent variable x_i and the latent variable y^*_i . In addition, there is a normally distributed error term e to capture random influences on this relationship. The observable variable y_i is a dichotomous variable depicting the respondent's welfare status and took the value of 1 if the respondent was poor and 0 if not, based on the poverty line (minimum welfare threshold) of less than \$2.15 per day per person. The model is as specified:

$$Y_i = \begin{cases} 1 & \text{if } y * i < PL \\ 0 & \text{if } y * i \geq PL \end{cases}$$

$$Y^*_i = \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + e_i$$

Where;

Y_i - Processors welfare status (1 if poor, 0 if otherwise)

X_1 - Sex of the processor (1 if male, 0 if female)

X_2 - Marital status of the processor (1 if married, 0 if single, divorced, widow)

X_3 - Educational status of the processor (in years spent in school)

X_4 - Adult equivalents household size (numbers)

X_5 - Primary occupation of the processor (1 if oil palm processing, 0 if farmer, artisans, civil- servants)

X_6 - Cooperative membership of the processor (1 if yes, 0 if No)

X_7 - Processing method (1if local method, 0 if modern method)

X_8 - Access to credit (1 if processor has access, 0 if otherwise)

X_9 - Experience in oil palm processing (Years)

X_{10} -Processing household Monthly income (Naira)

3 Results and discussion

3.1 Socio-economic and Demographic Characteristics of Respondents

The socioeconomic characteristics of the respondent were presented in Table 1. From the table, majority of the respondents (76.9%) were female while 23.1 percent of the respondents were male. A higher proportion of (50.6%) of the oil palm processor fell in the active age bracket of 41-50 years. Therefore, the majority of the respondents were middle-aged people. This distribution has two implications on poverty. This distribution ranked all the respondents on the average at their economically active age which implies that they can go about their daily activities in order to earn income with which catering for their family basic needs is enhanced. It also shows that they are still at the child bearing age which leaves much to be desired because, the larger the family size, the more thinly spread is the family’s income. Thus, these can result in reduction in poverty on basic needs.

Table 1 Distribution of Processing household by Demographic and Socio-economic Characteristics in the Study Area

Variables	Category	Frequency	Percentage (%)
Sex	Male	37	23.1
	Female	123	76.9
Age(years)	21-30	1	0.6
	31-40	42	26.3
	41-50	81	50.6
	51-60	26	16.3
	>60	10	6.3
Marital status	Single	7	4.4
	Married	130	81.3
	Divorced	7	4.4
	Widowed	16	10
Household size	1-4	1	0.6
	5-9	40	25
	10-14	104	65
	15-19	14	8.8

	20-24	1	0.6
Educational level of household head	No formal	81	50.6
	Primary	31	19.4
	Secondary	44	25.5
	Tertiary	4	2.5
Processing experience (years)	1-9	7	4.4
	10-19	87	54.4
	20-29	49	30.6
	30-39	13	8.1
	40-49	4	2.5
Access to credit	Have access	40	25
	No access	120	75
Cooperative membership	Member	26	16.3
	Non-member	134	83.8
Primary occupation	Oil palm processing	110	68.8
	Farming	24	15
	Artisans	18	11.25
	Civil-servants	8	5

Source: field survey, 2023

Majorities (81.3%) of the sampled processors were married, 10 percent were widowed, this will as a matter of fact, affect their level of living as the burden of catering for themselves and children (as often the case in most Nigerian families) shift completely to the women. The percentage of single-headed household is 4.4 percent, while 4.4 percent were divorced. Also, the distribution of educational status revealed that a high proportion (50.6%) of the oil palm processors had no formal education, 19.4 percent had primary education, while 25.5 percent had secondary education. About 68.8 percent of them have oil palm processing as their primary occupation while 15.0 percent are engaged in farming. Breakdown of other trades include 11.25 percent artisans and 5 percent civil-servants.

Household size of respondents indicated in Table 1 shows that a greater share of the sampled households has household size of between 10-14, 104 respondents representing 65 percent are in this group. The impact of large family size is such that it reduces the per capita expenditure of the family thereby aggravating poverty in these households.

Majority (54.5%) of the respondents had been in oil palm processing between ten to nineteen years (10-19). Further analysis showed that the mean processing experience of the oil palm processors was 14.5 years. Those who had access to credit accounted for about 25 percent of the respondents. Also, 16.3 percent of the respondents were members of cooperatives.

3.2 Housing and Living condition status of the Respondents

The housing condition of a family provide good indicator of welfare measurement. Table 2 provides with the description of households by their accommodation status, major source of water for drinking and cooking, sanitary conditions, main roof material, source of fuel for cooking and sources of electricity supply.

Table 2 Distribution of Households by Accommodation Status and Household Amenities

Particulars	Frequency	Percentage
Accommodation status		
Owner	91	56.875
Tenants	20	12.5
Owned by relatives/ friend	49	30.625
Household water supply		
River/Pond	51	31.875
Wells	84	52.5
Boreholes	10	6.25
Tap	15	9.375
Source of fuel for cooking		
Firewood	105	65.625
Charcoal	50	31.25
Electricity	5	3.125
Gas	0	0
Main roof material		
Straw/raffia leave	57	35.625
Sheet aluminium	103	64.375
Tiles	0	0
Slab roof	0	0
Main source of lighting		
Oil lamp	40	25
Candle	23	14.375
Electricity	97	60.625
Torch	0	0
Types of sanitary used		
Latrines	120	75
Modern toilets	25	15.625
Open defecation	15	9.375

Source: field survey, 2023

It was seen from the table 2 that majority (56.875 percent) of the respondent households have accommodation of their own, 12.5 percent are tenants while 30.625 percent lived in a house owned by relatives/friends. The information on the sources of water for drinking and cooking, source of fuel for cooking, main roof material, sanitary conditions as well as supply of electricity could provide insight to the living conditions of the people. Most common source of water available to households was well which accounted for more than 52 percent. Majority (60.625 percent) of the households possess electricity facility which indicates well access of this facility. However, the access of facilities such as sanitation and cooking fuel use indicate a distress condition of the living standards in the study area. Majority of the houses (65.625 percent) uses firewood as a source of fuel for cooking, 31.25 percent uses charcoal while only 3.125 uses electricity. About 65.625 percent had aluminum sheet as their main roof material while others were made of straw/raffia leaves.

Majority (75 percent) of the households uses latrines, only 15.625 percent of the household possess well sanitation (latrine toilet) facility in the areas under study and around 9 percent of the household still practices open defecation.

3.3 FGT Results showing the Extent of Poverty among Oil Palm Processors in the Study area

FGT (Foster, Greer and Thorbecke) poverty index was used to assess the extent of poverty among oil palm processors in the study area. The poverty aversion parameters employed were P_0 , P_1 , and P_2 which means incidence, depth and severity respectively.

Table 3 Poverty incidence, Depth and severity of respondents

Classification of poverty	frequency	Percentage
Poor	149	93.125
Non-poor	11	6.875
Poverty incidence $P_0=0.93125$		
Poverty depth $P_1=0.787129$		
Poverty severity $P_2=0.695926$		

Source: field survey, 2023

Table 3 shows extent and pattern of poverty among oil palm processors. Out of 160 sample processors surveyed, 149 of the oil palm processors were poor while 11 of them were non poor based on the poverty line. Results from the FGT model showed poverty incidence to be 0.93125, this implies that 93.125 percent of oil palm processors were poor. The poverty depth was 0.787129 implied that an average poor household in the study area has to mobilize resources up to 78.7129 percent of the poverty line i.e \$2.15 (N1812) which translates to N1426.266 (or US\$1.6923) to become non poor. It is therefore clear that poverty is present among the sampled processors in study area. The poverty severity index value of 0.695926 shows the seriousness of poverty in the study area. The closer the value of this index to one the serious the poverty in the area.

3.4 Factors that determines Poverty and Welfare among Oil Palm Processors in the study area

Table 4 Tobit Model Result on the Determinants of Poverty and Welfare among Oil Palm Processors in the Study area

Variable	Coef.	Std. Err.	T	P> t
Gender	-7.610369	29.64305	-0.26	0.798
Marital status	-5.501131	18.31627	-0.30	0.764
Education status	-9.810653	14.16379	-0.69	0.490
Primary occupation	.6589484	26.81748	0.02	0.980
Cooperative membership	-29.30084	33.82764	-0.87	0.388
Access to credit	-127.8936**	30.04928	-4.26	0.000
Processing method	215.9574**	56.71982	3.81	0.000
Monthly income	-.0016736**	.000611	-2.74	0.007
Processing experience	-11.4704**	3.437987	-3.34	0.001
Household size	18.42322**	6.440333	2.86	0.005
_cons	394.7375	97.57203	4.05	0.000
/sigma LR chi2(11)= 114.33 Prob > chi2= 0.0000 Pseudo R ² = 0.0558 Log likelihood= -967.70341	151.8024	8.898819		

Source: Computed from Survey data, 2023; **Significant at 5% level

A Tobit regression was used in determining the factors influencing poverty and welfare status of the people in the study area. The chi-square of 114.33 obtained in the study implies that the parameters included in the Tobit model are significantly different from zero at the 1 percent significant level. Moreover, the likelihood function of the model was significant (967.70341, with $p < 0.0000$) showing strong explanatory power of the model. The result of the estimated welfare model is presented in Table 4.

Out of the variables used five variables were found to be statistically significant. They are access to credit, processing method, monthly income, years of processing experience and household size. However, while household size and processing method used by the processor exerts positive effects other variables exert negative effect which conforms to prior expectation.

Access to credit by processing household has a significant negative relation on the likelihood of being poor and having a low welfare and this will aid the households to escape from poverty and thereby improve the household welfare. This is in line with the general believed that credit is an anti-poverty strategy because of the important role it plays among rural populace [14]. Credit assists the processing households in the purchase of modern processing instruments which will ultimately increase their productivity. Therefore, a unit increase in credit access will reduce the probability of the households being poor by 127.8936%. Processing method is significant at 5% and has a positive effect on the likelihood of being poor, which means that a unit increase in the use of local processing method will increase the probability of the household being poor and having a low welfare by 216%.

Monthly income is significant at 5% and has a negative effect on the poverty status suggesting that a unit increase in monthly income would reduce the likelihood of being poor by 0.0016% and thereby improve their welfare status.

Years of processing experience is also significant at 5% and has a negative effect on the likelihood of being poor which implies that a unit increase in the years of processing experience reduces the likelihood of having a low welfare status by 11.4%

The result obtained further revealed that the likelihood of being poor were more with larger households which suggest that an average household with small family size seems better in terms of living conditions than those of big size family household. Therefore, a unit increases in the size of the processing household increases the probability of being poor by 18.4%.

Other variables are not having statistically significant impact on household welfare, notwithstanding have important bearing on household living standards.

4 Conclusion

Based on the results we can conclude that access to credit, processing method, monthly income and years of processing experience contribute positively to processors welfare in the study area. On the other hand, household size contributes negatively to the processor's welfare. On the basis of the findings, it is recommended that credit should be provided to oil palm processors at the right time to finance their operations and it should be at a reduced interest rate so as to promote the processing activities. Also, agricultural institute should be encouraged to fabricate additional processing equipment to ensure its accessibility for processors. In the same vein, there is the need to put in place measures that will reduce cost of processing equipment incurred by the processors, this will help to improve the amount processed and reduce the drudgery it entails. Lastly, policies which reduce household size will improve household welfare specifically; fertility control measures which the processors can understand and adopt should be the focus.

Compliance with ethical standards

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Disclosure of conflict of interest

The author declares there is no conflict of interest.



Statement of informed consent



Informed consent was obtained from all individual participants included in the study.

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Author’s short Biography

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