



## ASSESSMENT OF RURAL WOMEN INVOLVEMENT IN PALM OIL PROCESSING IN ONDO STATE, NIGERIA

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### Abstract

This study assessed the involvement of rural women in oil palm processing in Ondo state, Nigeria. A three stage sampling method was employed to select 200 oil palm processors used for the study. Primary data were collected using a structured questionnaire administered to respondents. Data collected were analyzed using descriptive and inferential statistics. The study showed that the average age of the rural women was 50 years, 56% of the respondents were married and 52% of the women hired labour for processing. It was shown that 37% of the women had between 1 and 10 years of processing experience with an average household size of 5 members. The oil palm processors were constrained with inadequate pressing or extraction machine, inadequate fruit meshing machine. The results revealed that age ( $p$ -value=0.001), marital status ( $p$ -value= 0.002), household size ( $p$ -value = 0.030) and processing experience ( $p$ -value= 0.002) were positively significant to the involvement of rural women in oil palm processing. It was concluded that rural women were more involved in oil palm processing. It could be recommended that mechanization of major stages of operations should be prioritized to alleviate the drudgery of rural women involved in oil palm processing.

**Key words:** oil palm, products, contributions, women

### Introduction

The oil palm (*Elaeis guineensis*) is one of the tree crops of economic significance in the tropics. The oil is derived from the fleshy fruit. Oil palm belongs to the family of *Palmae*, and sub family *Cocoideae* which is the most important member (Ibitoye, 2011). It is a monocotyledonous crop with fibrous roots which grows up to lengths of 15 meters as a single unbranched tree. There are over 2,600 species of oil palm (Adeyemo, 2015). The oil palm is a versatile tree crop with almost all parts of the tree being useful for economic and or domestic value. The principal product however, is the palm fruit which is processed to obtain palm oil, palm kernel oil and palm kernel cake (Ibitoye, 2011). Hence, oil palm is often referred to as a crop of multiple values, which underscores its economic importance (Akangbe *et al.*, 2011). Women are involved in processing and marketing of the crops, and also engage in a wide range of small on- and off- farm businesses earning vital income for their families, and enhancing their livelihood. It was reported that 41.4% of women at Imo state, Nigeria, were actively involved in palm oil processing at various stages, and perceived palm oil processing as a source of income and employment (Ajaero, 2011). Women traditionally produce the bulk of palm oil in Akwa Ibom state using local techniques, and despite being faced with challenges of child bearing and domestic chores, there has been a steady increase in women participation in oil palm production because of the increase urban demand for the product (Esu and Akam, 2013). Therefore, relevant information is needed to reveal the constraints associated with each stage of oil palm processing. This will help to identify where the processors require assistance and empowerment, and also be able to adopt the recommended research proven methods and technology. This study thus assessed rural women involvement in oil palm in processing in Ondo State, Nigeria.

## Methodology

### Population and Sampling Method

The population consisted of the rural women that participate in oil palm processing Okiti pupa, Ondo state. A three-stage sampling technique was used in selection of respondents for the study. The first stage involves the selection of two local government areas (Okitipupa and Irele) from the eighteen Local government areas in Ondo State. Okitipupa and Irele LGA were selected due to their active involvement in oil palm processing. The second stage involved the selection of twelve communities from the two Local government areas. The communities were Iju-Odo, Ikoya, Igbotako, Ilu –tuntun, Aye and Ode-Aye in Okitipupa LGA, while Irele-Ijare, Igboke, Gbogi, Iyara, Aduga and Akingboye were selected from Irele LGA. Third stage involved ten percent selection of oil palm processors from the list of oil palm processors in each community to arrive at a sample size of 252 respondents.

**Table 1: Sampling Procedure and Sample Size**

Selection of LGA (2)	Communities (12)	Oil palm processors	10% selection	Sample size
Okitipupa	Iju-odo	250	25	<b>252</b>
	Ikoya	150	15	
	Igbotako	250	25	
	Ilu-titun	300	30	
	Aye	150	15	
	Ode-Aye	200	20	
Irele	IreleIjare	250	25	
	Igboke	195	19	
	Gbogi	136	13	
	Iyara	277	27	
	Aduga	205	20	
	Akingboye	183	18	

**Source: Field Survey, 2019**

### Data Collection and Analysis

Primary data were collected using a structured questionnaire on the socio-economic characteristics of oil palm processors, activities in oil palm processing, level of involvement in oil palm processing, revenue generated from oil palm processing and constraint associated with oil palm processing in the study area. Prior to the administration of the questionnaires, the questionnaires were pre-tested and necessary corrections were made. Content validity was used to determine the adequacy of the research instrument. In the process, the instrument was thoroughly and independently examined by appropriate experts. The experts gave their critical opinions on the adequacy and relevance of the instrument to the objectives of the study. The observations were harmonized and necessary corrections were made on the instrument before the start of the survey. The test retest method was used to determine the reliability of the research instrument. Twenty copies of the research questionnaire were administered twice to the respondents at given intervals. The variables were measured as follows; Involvements of rural women in oil palm processing in the study area consist of fourteen (14) processing activities. Respondents were asked to indicate their level on the scale as Always, Seldom and Never. Therefore any activities having mean that is 2.5 and above is considered as regular activities that

the respondents are involved in, whereas any activities having mean lower than 2.5 is considered as activities that the respondents are seldom involved in.

Level of products obtained from oil palm processing in the study area consists of seven (7) by products. Respondents were asked to indicate the products obtained on the scale as High, Medium and low. Therefore any product having mean that is 2.5 and above is considered as high, any product having mean less than 2.5 is considered as medium and those that have mean less than 2.0 is considered as low. Lastly the constraints facing the women processors consist of sixteen (16) constraints that have been identified. Respondents were asked to indicate the constraints they encountered on a 4-points Likert type scale as not severe, less severe, severe and very severe. The cutoff point is 2.5. Therefore, any constraints having a mean of 2.5 and above is considered as major constraints, while any constraints having below 2.5 is considered as minor constraints. The data collected for this study were analyzed using both descriptive and inferential statistics. The elements of descriptive statistics such as average, frequency and percentages were adopted to analyze the socio-economic characteristics of oil palm processors in Ondo state, Nigeria. Chi square was used to analyze the hypothesis

## Results and Discussion

### Socio-Economic Characteristics of Oil Palm Processors

Table 2 shows the socio-economic characteristics of women involved in oil palm processing. The mean age of the women was 50 years. This implies that palm oil processors were above their middle and productive age hence may not be able to carry out tedious operations in palm oil processing. This agrees with the assertions of Akangbe *et al.*, (2011) that oil palm processors in Nigeria were aged. However, if processing technologies were appropriately used, the age could be an added advantage because older respondents are more experienced thus positively contributing to production of oil palm in the study area. Little above average (56%) of the respondents were married, which implies that there are more married palm oil processors in the study area. This corroborates Nnadi *et al.* (2012) who claimed that marriage enhanced complementarity of efforts. Also, it was revealed that majority (65%) of the women were Christians. This probably implies that Christianity is the major religion practiced in the study area. It was shown that 35.5% of the women in the study area have non- formal education. The finding agrees with Akangbe *et al.*, (2011) assertion that there was a low level of education among women processing palm oil in Nigeria and that this could be a limiting factor affecting respondents' ability to adopt and use improved palm oil extracting techniques and facilities.

It was revealed that 52% of the women, hired labour for the processing of oil palm in the study area. This implies that human labour is important in oil palm production system. This agrees with Kelvin (2017) who opined that the agricultural system is mainly done without machines and thus human labour becomes important in the production system, accounting for about 90% of the entire operations. It result showed that 55% of the respondents have a household size of five people or less. This implies that majority of the respondents have a small house hold. This agrees with the findings of Muhammed-Lawal *et al.* (2009) and Akpomuvia (2010) that a range of 4 – 6 members constituted the modal household size among rural farmers in Nigeria. Distribution of respondents' based on primary occupation showed that 33.5% of the women were farmers' this reveals the relative importance of farming to other occupation in the study area. This agrees with the position of Oluwatayo (2008) that 51.7 percent of the rural households have farming as their primary occupation. The result further shows that 37% of the women have processing experience of 10 years and below. This is contrary to Agwu (2006) and Deji *et al.* (2012) positions that the

mean years of the processing experience among oil palm processors' in South-west and Ondo State were 13 and 14.5 years respectively. The result also revealed that majority (63.5%) of the women in the study area, earned annual income between ₦100,001 and ₦200,000. Furthermore, 36% of the respondents financed their oil palm processing through their personal savings and majority (85%) of the respondents have no contact with extension agents.

**Table 2: Distribution of Respondents by their Socio-economic Characteristics (n=200)**

Variable Group	Frequency	Percentage	Mean ± (SD)
<b>Age</b>			
≥30	16	8.0	50.23± 12.71
31-50	83	41.5	
51-70	93	46.5	
>70	8	4.0	
<b>Marital Status</b>			
Single	12	6.0	
Married	112	56.0	
Separated	27	13.5	
Divorce	11	5.5	
Widow	38	19.0	
<b>Religion</b>			
Christianity	134	67.0	
Islam	51	25.5	
Traditional	15	7.5	
<b>Level of Education</b>			
Non formal	80	40.0	
Primary	61	30.5	
Secondary	45	22.5	
Tertiary	14	7.0	
<b>Source of labour</b>			
Self	33	16.5	
Family	54	27.0	
Hired	104	52.0	
Others	9	4.5	
<b>Household size</b>			
< 5 people	111	55.5	5.69 ± 2.97
6 – 10 people	76	38.0	
>10 people	13	6.5	
<b>Primary Occupation</b>			
Farming	67	33.5	
Trading	91	45.5	
Artisan	41	20.5	
Others	1	0.5	
<b>Processing experience</b>			
10 years and below	74	37.0	16.84±10.79
11 – 12 years	67	33.5	
21 – 30 years	38	19.0	
>30	21	10.5	
<b>Average annual income</b>			
≥100,000	53	26.5	149470±56198
100,001 – 200,000	127	63.5	
>200,000	20	10.0	
<b>Source of finance</b>			
Personal savings	72	36.0	

Loan from friends	44	22.0
Bank	12	6.0
Cooperative	26	13.0
Others	46	23.0
<b>Contact with extension agents</b>		
No	170	85.0
Yes	30	15.0

Source; Field Survey, 2019

### Involvement of Rural Women in Oil Palm Processing

The result in table 3 shows the oil palm processing activities the women carried out regularly. These include fruit mashing ( $x=2.88$ ), separation from impurity ( $x=2.88$ ), boiling of fruits ( $x=2.86$ ), extraction of oil ( $x=2.83$ ) among others. However, the women seldom involved in nut separation and nut drying with mean of 2.21 and 2.16 respectively. This may be because these activities can easily be carried out by children after the palm oil has been extracted. The result shows that women were involved in many of the activities in oil palm processing. Therefore, there is need for efficient processing technique which can increase the quality and quantity of food available for consumption and trade (Etoamaihe and Ndubueze, 2010). Moreover, FAO (2010) and Aina (2012) found that gender differential is one of the important factors influencing adoption of improved technologies.

**Table 3: Distribution of the women by their level of involvement in oil palm processing**

S/N	Activities	Always	Seldom	Never	Mean	Remark
1	Purchasing of bunches oil palm	104 (52.0)	46 (23.0)	50 (25.0)	2.27	Seldom
2	Transportation of bunches	139 (69.5)	36 (18.0)	25(12.5)	2.57	Always
3	Reception of oil palm bunches	115 (57.5)	38 (19.0)	47(23.5)	2.34	Seldom
4	Removal of fruit from bunch	150 (75.0)	34 (17.0)	16 (8.0)	2.67	Always
5	Fruit fermentation	131 (65.5)	48 (24.0)	21(10.5)	2.55	Always
6	Sorting	163 (81.5)	30 (15.0)	7 (3.5)	2.78	Always
7	Boiling of fruit	174 (87.0)	24 (12.0)	2 (1.0)	2.86	Always
8	Fruit mashing / grinding	178 (89.0)	20 (10.0)	2 (1.0)	2.88	Always
9	Oil clarification/ separation from impurity	178 (89.0)	20 (10.0)	2 (1.0)	2.88	Always
10	extraction of oil	171 (85.5)	24 (12.0)	5 (2.5)	2.83	Always
11	Oil drying	131 (65.5)	54 (27.0)	15 (7.5)	2.58	Always
12	Oil storage	131 (65.5)	44 (22.0)	25 (12.5)	2.53	Always
13	Fiber & nut separation	90 (45.0)	62 (31.0)	48 (24.0)	2.21	Seldom
14	Nut drying	85 (42.5)	61 (30.5)	54 (27.0)	2.16	Seldom

Source; Field Survey, 2019; Percentages are in parenthesis

### Level of Products obtained from Oil Palm Processing

The result in table 4 show the products obtained from palm fruit. Out of all the products identified, palm oil has the highest quantity ( $x=2.88$ ), followed by palm kernel oil and palm kernel shell ( $x= 2.18$  respectively and palm kernel cake ( $x= 2.11$ ) in the study area. This implies that beside palm oil as the major bye product of palm fruits, other bye products are processed which are useful both for household consumption and for sales. Nwalieji *et al.*, (2018) found that greater proportion of oil palm processors produced within the range of 151-200 litres of palm oil.

**Table 4: Distribution of the respondents based on the level of product from palm fruit**

S/N	Products	High	Medium	Low	Mean±(SD)	Remark
1	Palm oil	176(88.0)	23 (11.5)	1 (0.5)	2.88±(0.35)	High
2	Palm kernel oil	76 (38.0)	84 (42.0)	40 (20.0)	2.18±(0.74)	Medium
3	Palm kernel	62 (31.0)	95 (47.5)	43 (21.5)	2.10±(0.72)	Medium
4	Palm kernel cake	69 (34.5)	83 (41.5)	48 (24.0)	2.11±(0.76)	Medium
5	Palm kernel shell	75 (37.5)	85 (42.5)	40 (20.0)	2.18±(0.74)	Medium
6	Palm oil slurry	91 (45.5)	88 (44.0)	21 (10.5)	2.35±(0.66)	Medium
7	Cosmetic ( <i>adin</i> )	15 (7.5)	75 (37.5)	110(55.0)	1.53±(0.63)	Low
8	Others (Specify/list them)	11 (5.5)	47 (23.5)	142(71.0)	1.35±(0.58)	Low

Source: Field Survey, 2019 Percentages are in parenthesis

### Constraints to Oil Palm Processing

The result in table 5 shows the constraints to oil palm processing. The result shows that lack of extraction machine ( $x=3.47$ ) mashing machine ( $x=3.37$ ), storage facilities ( $x=3.03$ ), difficulties in sorting ( $x=3.12$ ) among others were some of the challenges encountered by the oil palm processors. This implies that the constraints revolve round lack of improved technology in oil palm processing. Moreover, the use of traditional technique in oil palm processing could make processing more laborious, time-demanding and consequently inefficient. Esu and Akam (2013) identified use of traditional techniques as major constraints to palm oil processing in Nigeria.

**Table 5: Distribution of respondents by the constraints faced in oil palm processing**

S/N	Variables	V.S	S	L.S	N.S	MEAN
1	Difficulties in harvesting palm kernel	119(59.5)	52(26.0)	17(18.5)	12(6.0)	3.39
2	Lack of pressing or extraction machine	104(52.0)	87(43.5)	8(4.0)	1(0.5)	3.47
3	Lack of fruit meshing machine	100(50.0)	79(39.5)	16(8.0)	5(2.5)	3.37
4	Lack of credit/loan facilities	75(37.5)	65(32.5)	44(22.0)	16(8.0)	3.00
5	Labour unavailability	103(51.5)	63(31.5)	25(12.5)	9(4.5)	3.30
6	Delay in fruit fermentation	61(30.5)	63(31.5)	49(24.5)	27(13.5)	2.79
7	Lack of storage facilities	70(35.0)	85(42.5)	26(13.0)	19(9.5)	3.03
8	Poor transportation system	81(40.5)	59(29.5)	36(18.0)	24(12.0)	2.99
9	Difficulties in sorting	76(38.0)	88(44.0)	20(10.0)	16(8.0)	3.12
10	Delay in drying of nut	54(27.0)	70(35.0)	38(19.0)	38(19.0)	2.70
11	Difficulties in fiber and nut separation	56(28.0)	66(33.0)	44(22.0)	34(17.0)	2.72
12	Time consumption in palm kernel removal	94(47.0)	70(35.0)	28(14.0)	8(4.0)	3.25
13	Available machine develops fault easily	90(45.0)	78(39.0)	21(10.5)	11(5.5)	3.22
14	Proximity to water	92(46.0)	64(32.0)	21(10.5)	23(11.5)	3.13
15	Late response of labourers	97(48.5)	61(30.5)	31(15.5)	11(5.5)	3.22
16	Difficulties in oil clarification	65(32.5)	73(36.5)	45(22.5)	17(8.5)	2.93

Source: Field Survey 2019 V.S= Very Severe, S= Severe, L.S= Less Severe, N.S= Not Severe

Table 6 shows the result of chi-square test between selected socio economic characteristics of the respondent and their level of involvement in oil palm processing. Age is significant to the level of involvement in oil palm processing. This implies that the older the age of the respondents, the better their mastery on oil palm processing. This may be because age can be connected with

experience on the job. Similarly, marital status was significant. This implies that married women were more involved than the unmarried women. This may be because married respondents have their share of responsibility in the family and will not take their source of income with levity due to marital and societal demands. Household size was significant to the level of involvement in oil palm processing in the study area. This implies that respondents with big household size can involve their household member in oil palm processing.

**Table 6: The Result of Chi-Square Test of Independence between Some Selected Socio-economic Characteristics of the Respondents and their Level of Involvement in Oil Palm Processing**

Variable	Df	Chi – square	p-value	Decision
Age	47	93.760	0.000	Significant
Marital Status	4	173.550	0.000	Significant
Level of Education	4	76.600	0.000	Significant
Source of Labour	3	98.040	0.000	Significant
Household size	14	121.600	0.000	Significant
Processing experience	40	128.820	0.000	Significant

Source: Field Survey, 2019  $P \leq 0.05$

### Conclusion

The study concluded that the oil palm processing activities the women carried out regularly include fruit mashing, separation from impurity, boiling of fruits, and extraction of oil among others. Moreover, out of all the products identified, palm oil has the highest quantity, followed by palm kernel oil, palm kernel shell and palm kernel cake. The oil palm processors were faced with many challenges which include inadequate extraction machine, inadequate fruit meshing machine and problem of labour supply. As a result of these constraints, most of these activities were being done manually. Therefore, the study recommended that major stages of operations such as fruit digestion and oil extraction should be mechanized to alleviate the drudgery of women processors. Moreover, the research institute in collaboration with the extension agency should train the oil palm processors on improved technologies in oil palm processing

### References

- Adeyemo A.O. (2015). Analysis of the Determinants of Palm Oil Production in Nigeria. *Greener Journal of Agricultural Sciences* 5(4):110-117.
- Agwu, A.E. (2006). Adoption of improved oil palm production and processing technologies in Arochukwu local government area of Abia State, Nigeria. *Agro-Science*, 5(1): 25-35, DOI: 10.4314/as.v5i1.1541
- Aina, O.I. (2012). Two halves make a whole: Gender at the crossroads of the Nigerian development agenda. Inaugural Lecture Series 250, Obafemi Awolowo University. 67
- Ajaero J.O, Umunakwe P.C. & Anele, O.C. (2011). Roles of Rural Women in Palm Oil Processing in Nkwere Local Government Area of Imo State, Nigeria. *Futo Journal Series 1*(2):111-118.
- Akangbe, J. A., Adesiji, G. B., Fakayode, S. B. & Aderibigbe, Y. O. (2011). Towards Palm Oil Self-sufficiency in Nigeria: Constraints and Training needs Nexus of Palm Oil Extractors. *Journal of Human Ecology* 33(2): 139-145.
- Akpomuvia, O.B. (2010). Self-help as a strategy for rural development in Nigeria: A bottom-up Approach. *JAPSS*, 2(1): 88-111.
- Deji O.F.; Owombo, P. T.; Koledoye, G. F. (2012). Impacts of training in oil Palm processing

- technologies among small scale farmers in Ondo State, Nigeria. *J. Agric. Biodiv. Res.* 1(6):85 - 90.
- Esu B. B. & Akam A.E. (2013). Women Participation in Oil Palm Processing in Nigeria: A Case Study of Akwalbom State. *International Journal of Basic and Applied Sciences*, 2(2). 60-64. 2277-1921.
- Etoamaihe, U.J. & Ndubueze, K.C. (2010). Development of motorized African bread fruit dehuller. *Journal of Engineering and Applied Science*, (5) 312-315.
- FAO (2010). Small- scale palm oil processing in Africa. Agricultural Sciences Bulletin 148. Rome, Italy.
- Ibitoye, O.O, Akinsorotan A.O, Meludu N.T., Ibitoye B.O. (2011). Factors affecting oil palm production in Ondo State, Nigeria. *Journal of Agriculture and Social Research.* 11(1):97-105.
- Kelvin A., (2017). Nigeria Agriculture and Sustainability: Problems and Solutions. Thesis for Bachelor of Sustainable Coastal Management Degree Programme in Sustainable Coastal Management Raseborg. Retrieved online at <https://www.theseus.fi/bitstream> on November, 2019
- Muhammad-Lawal, A.; Omotesho, O. A. and Falola, A. (2009): Technical efficiency of youth participation in agriculture: A case study of the Youth - In - Agriculture Programme in Ondo State, South Western Nigeria *Nigerian Journal of Agriculture, Food and Environment* 5(1):20-26
- Nnadi, F.N., Umunakwe, P.C., Nnadi, C.D. & Okafor, O.E. (2012). Socioeconomic determinants of farmers' use of ethnoveterinary medicine in Mbaitoli local government area of Imo State, Nigeria. *Research Journal of Agriculture and Environmental Management*, 1(1) 025-033.
- Nwalieji, H.U. & Ojike, H.U. (2018). Characteristics of small-scale palm oil production enterprise in Anambra State. *J.Agric.Ext.*, 22(1): 22-34, DOI: 10.4314/jae.v22i1.3
- Oluwatayo, I. B. (2008). Explaining Inequality and Welfare Status of Households in Rural Nigeria: Evidence from Ekiti State. *Humanity and Social Sciences Journal* 3(1), 70-80, ISSN 1818-4960