



# Journal of Development and Agricultural Economics

Volume 8 Number 11 November 2016  
ISSN 2006-9774



*Academic  
Journals*

## ABOUT JDAE

The Journal of Development and Agricultural Economics (JDAE) (ISSN:2006-9774) is an open access journal that provides rapid publication (monthly) of articles in all areas of the subject such as The determinants of cassava productivity and price under the farmers' collaboration with the emerging cassava processors, Economics of wetland rice production technology in the savannah region, Programming, efficiency and management of tobacco farms, review of the declining role of agriculture for economic diversity etc.

The Journal welcomes the submission of manuscripts that meet the general criteria of significance and scientific excellence. Papers will be published shortly after acceptance. All articles published in JDAE are peer- reviewed.

### Contact Us

**Editorial Office:** [jdae@academicjournals.org](mailto:jdae@academicjournals.org)

**Help Desk:** [helpdesk@academicjournals.org](mailto:helpdesk@academicjournals.org)

**Website:** <http://www.academicjournals.org/journal/JDAE>

**Submit manuscript online** <http://ms.academicjournals.me/>

## Editors

**Prof. Diego Begalli**

University of Verona  
Via della Pieve, 70 - 37029  
San Pietro in Cariano (Verona)  
Italy.

**Prof. S. Mohan**

Indian Institute of Technology Madras  
Dept. of Civil Engineering,  
IIT Madras, Chennai - 600 036,  
India.

**Dr. Munir Ahmad**

Pakistan Agricultural Research Council (HQ)  
Sector G-5/1, Islamabad,  
Pakistan.

**Dr. Wirat Krasachat**

King Mongkut's Institute of Technology Ladkrabang  
3 Moo 2, Chalongkrung Rd,  
Ladkrabang, Bangkok 10520,  
Thailand. Nigeria.

**Prof. Mammo Muchie**

Tshwane University of Technology,  
Pretoria, South Africa and  
Aalborg University,  
Denmark.

**Dr. Morolong Bantu**

University of Botswana, Centre for Continuing  
Education  
Department of Extra Mural and Public Education  
Private Bag UB 00707  
Gaborone, Botswana.

**Dr. Siddhartha Sarkar**

Faculty, Dinhat College,  
250 Pandapara Colony, Jalpaiguri 735101, West  
Bengal,  
India.

**Dr. Bamire Adebayo Simeon**

Department of Agricultural Economics, Faculty of  
Agriculture  
Obafemi Awolowo University

## Editorial Board

### **Dr. Edson Talamini**

Federal University of Grande Dourados - UFGD  
Rodovia Dourados-Itahum, Km 12  
Cidade Universitária - Dourados, MS -  
Brazil.

### **Dr. Okoye, Benjamin Chukwuemeka**

National Root Crops Research Institute,  
Umudike. P.M.B.7006, Umuahia, Abia State.  
Nigeria.

### **Dr. Obayelu Abiodun Elijah**

Quo Vadis Chamber No.1 Lajarin Road,  
Sabo - Oke P.O. Box 4824, Ilorin Nigeria.

### **Dr. Murat Yercan**

Associate professor at the Department of  
Agricultural Economics, Ege University in Izmir/  
Turkey.

### **Dr. Jesiah Selvam**

Indian Academy School of Management  
Studies(IASMS)  
(Affiliated to Bangalore University and Approved By  
AICTE)  
Hennur Cross, Hennur Main Road, Kalyan Nagar PO  
Bangalore-560 043  
India.

### **Dr Ilhan Ozturk**

Cag University, Faculty of Economics and  
Administrative Sciences,  
Adana - Mersin karayolu uzeri, Mersin, 33800,  
TURKEY.

### **Dr. Gbadebo Olusegun Abidemi Odularu**

Regional Policies and Markets Analyst, Forum for  
Agricultural Research in  
Africa (FARA), 2 Gowa Close, Roman Ridge, PMB CT  
173, Cantonments,  
Accra - Ghana.

### **Dr. Vo Quang Minh**

Cantho University  
3/2 Street, Ninh kieu district, Cantho City,  
Vietnam.

### **Dr. Hasan A. Faruq**

Department of Economics Williams College of  
Business  
Xavier University Cincinnati, OH 45207  
USA.

### **Dr. T. S. Devaraja**

Department of Commerce and Management, Post  
Graduate Centre,  
University of Mysore, Hemagangothri Campus, Hassan-  
573220, Karnataka State, India.

**ARTICLE**

<b>Women in palm oil processing in South-East Nigeria challenges and prospects in a dwindling economy</b>	<b>251</b>
E. C. Nwankwo	

*Full Length Research Paper*

# Women in palm oil processing in South-East Nigeriachallenges and prospects in a dwindling economy

E. C. Nwankwo

Department of Agricultural Economics and Extension, Anambra State University, Nigeria.

Received 25 May, 2016; Accepted 22 September, 2016

This study investigated the role of women in palm oil processing in Anambra State Nigeria. It sought answers to the question as to the factors that hinder the productive role of women in palm oil processing and the measures necessary to realise the potentials of women in palm oil processing. Specifically, the study examined the socio-economic characteristics of the women and their effects on palm oil production; determined the cost and benefit involved in palm oil production; examined specific tasks done by women in palm oil processing in the study area; determined the factors which affect women's productive capacity in palm oil production, and on the basis of findings made recommendations for improvement. Anambra State was the study area. Making use of primary and secondary sources of information, the study found out that the age of farmers, finance, labour, marital status and household size of women significantly impact positive output. Noting that palm oil processing in the study area is a viable venture if well managed. The study made recommendations for the provision of enabling environment for improving the productive capacity of women

**Key words:** Anambra State, palm oil, women.

## INTRODUCTION

It is a well known fact that agriculture played very important role in the economy of Nigeria before the discovery of oil. In the 1960s before oil became the dominant income earner for Nigeria, Palm oil from the South eastern Region of Nigeria was one of the tripods on which the economy of Nigeria stood. The others were Cocoa from the Western Region and Groundnuts from the Northern Region. Each of these regions was doing very well economically in their areas of strength. Ironically, productions were by small holder farmers. With the discovery and the chest rated dependence of the

Nigerian economy on crude oil, the role of Agriculture as a whole and palm in particular dwindled. In the face rapidly expanding local demands Nigeria not only ceased exporting palm oil, but also became a net importer of palm oil even from Malaysia that took the seedlings from her. In fact the growth in oil palm has stagnated at 930,000 MT since 2013 while the consumption of palm oil in Nigeria amounts to 2.0 million MT per annum. According to Adetola (2015) official figures states that the shortage in oil palm industry is estimated to be around 1,070,000 MT annually. This poses a very precarious

E-mail: [euchariacnwankwo@yahoo.com](mailto:euchariacnwankwo@yahoo.com). Tel: 07063520808.

Author(s) agree that this article remain permanently open access under the terms of the [Creative Commons Attribution License 4.0 International License](https://creativecommons.org/licenses/by/4.0/)

situation not just for the manufacturing sector that uses it as input but even for diet. Crude oil became thus a curse for agricultural production generally and palm oil in particular in Nigeria.

The fluctuations in the crude oil market that led to a near total collapse of Nigeria's economy in the 1980s stimulated renewed interest in Agriculture. Various South Eastern states that were part of the old Eastern region embarked on activities to revamp palm oil production and processing. In Anambra State, the then administration of Robert Akonobi, for instance established in 1989 the Anambra State Palm Oil Development Agency (ASPOD). The Agency was charged with the responsibility to execute small holder palm development scheme as well as Oil palm plantation nurseries and oil mills among others. Even then, like all Government policies it never progressed beyond the regime. Between 1999 and 2003 the then Administration of Dr Chinwoke Mbadinuju reconstituted the Agency which did not outlive him. Significant enough, notwithstanding span of the mandate of the agency, its efforts were geared towards Production. Little or no specific attention was given to processing, except for the ripple effect of increased production.

In recognition of the enormous potential of Nigeria's palm oil sector, the country has been the 2<sup>nd</sup> largest recipient of oil palm projects from the World Bank, receiving 6 projects between 1975 and 2009. According to Gupta (2013), the outcomes of these projects led to an oil palm plantation of 42,658 hectares of land, road development and increased capacity of oil mills as direct effects (Gupta, 2013), yet far below the capacity of the country as former world leader in the oil palm industry. Very recently, the administration Rochas Okorochoa in Abia demonstrated great zeal in the sector such by 2015 the governor flamboyantly announced the capacity of his government to soon fund the greater part of the state budget with proceeds from palm oil production and processing. Every citizen of the state was required to at least plant a palm so as to boost production. In a country where policy sustenance, however good, is a big challenge, especially where government is the dominant actor, the likelihood of the efforts of the governor outliving his regime is doubted. Already, the initial enthusiasm on production and processing of palm oil is waning. The fact is that policy sustenance is part of the general problem of agriculture in Nigeria and palm oil sector in particular. A study by Enwelu et al. (2013) had focused on the same production. They examined the challenges and prospects of smallholder oil palm production in Awka Agricultural Zone of Anambra State, but noted as part of their recommendations the need to improve the processing sector even as a way of improving production. It is this processing that is the focus of this empirical research. By processing implies the conversion of crude palm oil to refined oil which involves removal of the products of

hydrolysis and oxidation, colour and flavour. The of palm fruits that gives rise to liquid fraction (olein) is used extensively as a liquid cooking oil in Nigeria and competes successfully with the more expensive groundnut, corn, and sunflower oils. After refining, the oil may be separated (fractionated) into liquid and solid phases by thermo-mechanical means (controlled cooling, crystallization, and filtering) ([www.fao.org](http://www.fao.org)).

In this study, we limited our usage to the processing of palm oil extraction. Even when we know that the further processing of palm kernel to give palm kernel oil is part of the processing, its extraction is generally separate from palm oil extraction, and will often be carried out in mills that process other oilseeds (such as groundnuts, rapeseed, cottonseed, sheanuts or copra). Both of the processing activities, like food processing in general, are activities chosen and dominated by women (Simmons, 1976; Okorji, 1985). Comparatively, most of the women are found in palm oil than palm kernel oil extraction and are all smallholders located in the rural communities of Anambra State. Compared to the output from the almost non-existent large scale processing industries (including the planned N1.2billion investment in the sector in the state by Chicason Group with a capacity production of 150 tons per day (Nwagbo, n.d.), these small holders account and will continue to account for the greater percentage of palm oil output in the state and are critical to restoring the state to its enviable status as exporter of palm oil. At present, however, their output cannot even satisfy local demands both quantitatively and qualitatively. Their capacity in this regard has been hindered. Despite the eminent role women in this sector of the economy play, Nigeria is yet to attain self sufficiency in palm oil and palm oil related products. Understanding the various roles of women in palm oil production becomes incomplete without understanding the various factors impinging on the productive capacity of women. This was the focus of this work. The goal is to improve on their productive capacity and their output. Specifically, the study:

- 1). Examined the socio-economic characteristics of these women and their effects on palm oil production;
- 2). Determined the cost and benefit involved in palm oil production;
- 3). Examined specific tasks done by women in palm oil processing in the study area;
- 4). Determined the factors which affect women's productive capacity in palm oil production and;
- 5). Made recommendations based on the findings of the study.

## Review of Literature

A cursory look into extant literature shows the significant role that women play in agriculture in general and palm

oil sector in particular. Steady (1985) observed that women probably produce 60 – 80% of Africa's agricultural products and recommended the improvement of the resources of women as to increase their participation in the economy. Enwezer (1984) and Clark (1985) were of the view that the small scale farming activities of the rural women are more vital in ensuring food security in Africa than the large scale mechanized food production. From historical perspective, Pala (1979) recognised the indispensable role of women in traditional economy and came up with a suggestion that women should be involved in all current development strategies, no matter what economic and political ideologies that may prevail in a region or country. This was the reason why Kachigwe (1986) believed that if more efforts were put into improving the role of women in agriculture, their integration into national development would be accelerated. Thus for Okorji (1986), achieving the goal of self sufficiency in food production in the country requires increasing the productive capacity of the rural woman who plays a dominant role in agriculture and related activities. As earlier observed, Palm oil processing in Nigeria is mainly carried out by women. It is even, traditionally, regarded as exclusively a female job (Usoro, 1974) and they have never shied away from it.

Generally, processing involves transformation of the raw produce into other forms in which it can be stored or eaten. Indeed, processing improves the acceptability of the produce. Research findings reveal that about 60% of all agricultural (on-farm) labour and 100% of labour involved in agricultural processing are supplied by the women folk (Olawoye, 2001). According to World Bank (1989), estimates of the food and agriculture organisation of the United Nations show that women account for more than half of the labour required to producing food consumed in the developing world. Furthermore, aggregated data suggest that African Women perform about 90% of the task of processing food crops, providing house hold water, fuel wood, 80% of the work of food storage and transportation from farm to village, 90% of the work of planting and weeding, and 60% of the work of harvesting and marketing. They are also increasingly involved in cash crop cultivation (Saito et al, 1994). The role of women in the processing of agricultural products cannot be over emphasized. Women participation in the small scale traditional agriculture, particularly palm fruit processing is important since the farming system of developing economy rely largely on women labour (Ciracia, 1995). In Nigeria, women have traditionally participated actively in farming and processing of farm produce and other related rural development activities (Kisekka, 1980). Scientists at the International Research Institute for the Semi-Arid Tropics (ICRISAT) have observed that women farmers cultivating India Marginal Lands can teach them a thing or two. And no wonder women do a major share of the production processing and preservation of food grains and cash crops in the

semi-Arid Tropics (FAO, 1994 as in Ezeibe (2012). According to Spencer (1976) the women spend several hours breaking up the clusters of palm fruits gathered by their husbands the day before. This painstaking and boring job does not prevent them, however, from carrying on with their domestic tasks. Women still do much of the processing of crops. The garri making, palm oil extraction, the cotton spinning are still done to a great extent by women (Dvorak, 1996).

It is a long established fact that in Africa, women perform more than 70% of agricultural activities including cash crop production and processing of food crops as well as animal husbandry (Saito and Weidemann, 1994). They carry out 90% of the work of processing food crops (Madeley, 2010). These agro-based food processing and preservation activities engaged in by rural women including palm oil extraction are usually and almost entirely on a small scale basis. Although they do these from the vantage point of increasing their income level, they also stimulate expansion of agricultural production because of the demand for raw materials to feed the industry. In fact, women are found in nearly every sector of the economy where they derive income for the survival of their household. They were reported to engage in more multiple income generating activities than men (Omiye, 2004). However, according to Jiggins et al. (1997), their contribution to the economy has often been underestimated and their role in agriculture remained invisible until about two decades ago. Since the 1985 World Conference on women in Nairobi, Kenya, new research studies have reported the crucial role of women as farm managers and active workers all over the world.

No doubt, it will be unrealistic for any country to neglect such a large and important segment of its society and yet hope to make significant strides in economic development. Thus, constraints that impede the productive capacity of these women in the agricultural sector will adversely affect the growth of the national economy. Not minding the fact that crude oil has continued to dominate the nation's economy as source of revenue, the contribution of agriculture to the gross domestic product is still the largest. The contribution of palm oil, despite its enormous potential, remains insignificant. The fact of the matter is that despite the active role of women to boost agriculture in Nigeria in general and palm oil in particular, they are still facing a lot of challenges. As in most developing countries of the world, there is high rate of illiteracy among rural women in Nigeria. Illiteracy is one of the known hindrances to the adoption of improved agricultural practices. Ekong (2003) is of the opinion that most rural women do not understand even a display of instructions by line diagrams. Various studies have shown that illiteracy does not allow a lot of rural women to understand innovations and application of process of such agricultural innovations. It has also negatively impacted the ability of women to access credit and extension services as well as their ability to know



their rights and identify economic support mechanisms that are available. In Nigeria where both men and women farmers do not have access to adequate resources, the access of women is even more limited due to cultural, traditional and sociological factors. In most parts of Nigeria, women have restricted access to land and this is a major source of constraint. Women need credit for the purchase of tools, equipments and other agricultural inputs. But because access to credit is often based on ownership of land and since the customary law do not allow them to share land property rights along with their husband, they cannot provide the collateral required by lending institutions. The lack of education and training also limits the ability of women in Nigeria to gain access to credit from formal financial institutions. One of the functions of agricultural cooperatives is to provide credit for the members, but in some societies, culture restricts women's membership in cooperative societies, thereby denying them access to credit (Prakash, 2003).

Women have little access to the benefits of research and appropriate technology especially in the domain of food crops processing, which have a low priority in research. In addition, women farmers' roles and needs are often ignored when devising technology. Even when the technology is appropriate for their use, lack of financial resources hinders the purchase and use of such technology by women. Mutangadura (2005) confirmed that HIV/AIDS epidemic in Sub-Saharan Africa is increasingly becoming one of the major impediments to sustainable development. The main gender related impact of HIV/AIDS on rural livelihood is increased workload of women due to morbidity and mortality of family members thereby affecting women's role in agricultural production and security of livelihoods. Other areas of impact are loss of non-farm income, loss of assets and decreased access to resources, collapsing rural safety of caring for orphans, increased vulnerability of women to loss of right to lands and property, and withdrawal of female children from school (FOSENET, 2007). The African culture abhors frequent and close association between married women and other men. Such association causes conflicts in the household (Ekong, 2003). As a result of this aspect of African culture, the interaction between male extension agents and rural women is highly limited. Owing to this restricted association with married women, agricultural research programmes have rarely taken into account rural women's knowledge and opinion about crop varieties and cropping systems. This situation has restricted rural women to traditional farming technology. They have very little access to modern technology that could benefit them in their farm and household activities. Also FAO (2007) discovered in their study of agricultural extension in Africa several commonly held beliefs that women are not really significant contributors to agricultural production. They are always tied down with household chores and children, they are shy, difficult to reach and resist

innovation.

## METHODOLOGY

Anambra state was used as a case study. The State is one of the 36 states that make up the federal republic of Nigeria. Geographically, Anambra state is in the South-East of Nigeria. It is bounded in the North by Kogi state, the West by Rivers, Niger and Delta states, in the South by Imo state and in the East by Enugu State. The climate can be generally described as tropical with two clear seasons, the wet and dry seasons. Farming is a predominant occupation in the area. The major arable crops produced include yam, cassava, maize and cocoa-yam, while oil palm is the most important tree crop grown by the people (Anambra State, 1989). The choice of the state is based on the fact that oil palm is one of the major tree crops in the area and the processing of the palm oil is a major activity of the women in the rural communities of the state. The state comprises of four agricultural zones namely Aguata, Anambra, Awka and Onitsha. Two zones, Awka and Aguata, were selected for the study. In these areas, women dominate in all processing. In each of these two zones, two Local Government Areas were selected at random giving a total of four Local Government Areas that were studied. In each of the four local government areas, two communities were randomly selected making a total of eight communities for the study. From these communities, a list of women into oil processing was made with the assistance of community leaders and extension agents in the area. Random Sampling technique was used to select ten respondents from each community. This gave a total of eighty processors used for the study.

Structured questionnaire was administered to the respondents. Oral interviews and observations during visits also provided part of the required data. The questionnaire provided information on the socio-economic characteristic of the women, cost and benefits, specific task done in palm oil processing. Some challenges were encountered in the course of data gathering. These challenges included illiteracy, inability of the women to keep records of their processing activities and poor accessibility. To deal with illiteracy challenges, the researcher sat down with each respondent and assisted in filling the questionnaire. This approach, though cumbersome had the advantage that all 80 questionnaires distributed were returned. It also offered opportunity for interview with the respondents. The data generated for this study was analysed with the use of descriptive statistics such as means, percentages and tables were used to analyse data so as to realise objectives (iii), (iv) and (v). Multiple regression analysis was used to realise objective (i) while objective (ii) was realised using the Gross Margin Analysis. Using SPSS package, Multiple Regression Analysis was used to determine the effect of socio-economic variables on women on the output of palm oil. Gross margin analysis was used to determine the profitability of palm oil production in the study area.

## RESULTS AND DISCUSSION

The interpretation and discussion of the findings were based on respondent's socio-economic characteristics. The socio-economic characteristics discussed include Gender, Age, marital status of the respondents, educational attainments, farming experience, family size, labour and source of farm funding of respondents. The gender distribution of the respondents showed that 22.2% of the respondents were males and 77.5% of them

were females (Field Survey, 2015). This shows that females dominate in palm oil processing in the area. It was equally discovered that women engage in almost all the stages of operations such as threshing, cooking, pressing or extraction, drying and oil packing. Men do the harvesting and pressing with the help of extracting machine. Machines do the pounding or digestion of the cooked fruit as well as extraction of the oil. The age distribution of the processors studied was important because palm oil processing requires the use of large amount of labour and able-bodied individuals. Different age groups were found to be involved in the palm oil processing activities in the study area. Persons of less than 30 years accounted for about 8.8% of those involved in the processing, 43.8% were within the range of 31 to 40 years, 38.8% fell within the range of 41 to 50 years while 8.8% were within the age range of 51 to 60 years respectively (Field Survey, 2015). With regard to the marital status of the respondents, 73.8% of them were married while 8.8% were single. About 12.5% of the processors sampled were Widows and 5% were divorcees (Field Survey, 2015). The high level of married processors in the study areas points to their emotional balance with their children and husband beside them to provide additional labour to augment their personal efforts.

The number of years spent acquiring formal education by the respondents was considered. Out of the total number of respondents, it was found that about 17.5% had no formal education, 50% had primary education, 22.5% had secondary education while 10% had tertiary education (Field Survey, 2015). Since education greatly determines farmer's rate of acceptance of modern practices and adoption of modern techniques, it was thought to enhance productivity and also the ability to efficiently manage risk in agriculture by the processors. From the data, it was seen that the level of illiteracy in the study area is high. This affected the degree of acceptance of new ideas and management skills. Since the level of farming experience is an index of efficiency, it could be deduced that the more the farmers farming experience, the more or greater their productivity. The distribution of respondents by the level of farming experience indicated that 47.2% of the farmers have been farming for up to 10 years while 52.8% were more experienced. The average years of experience of the farmers were 12 years (Field Survey, 2015). It may be probable that the less experienced farmers who may be younger in age have more educational background and are more willing to try modern innovations than their more experienced counterparts who on the other hand may be older and less literate.

The labour requirement in most farming enterprise especially the small scale is supplied by family members. The family size therefore becomes of great importance as a large size family will guarantee sample supply of labour for the farm. The family distribution showed that 81.5% of

the farmers have family size of less than 10 while 10.3% have greater family size. The average family size was 8. The farmers, therefore, resorted to hiring labour for their operations and thereby increased production cost. Their children only helped out during the weekends and holidays.

Indeed, labour is a major determinant of any agricultural production output and so is sought for through any means. The various means through which labour is employed in the study area are family hiring. Hired labour contributed 81.3% of the total labour needed, and family labour contributed 18.7% of the labour (Field Survey, 2015). This means that source of labour input is highest for hired labour and this implies more cost of production. Financing becomes, therefore very critical. Financing has been one of the constraints to increased production in the agricultural sector among smallholders especially in the processing subsector. This is because most formal credit sources are not accessible by small scale farmers and the informal credit sources provide funds at higher costs. In the study area, financing of most various production processes came from various sources, which included thrift (31.2%), cooperatives (0%), personal savings (53.8%) as well as family purse (15%) (Field Survey, 2015). In sum, the study revealed that the economic variables of gender, age of the processor, labour, farming experience and credit facilities significantly affected the output.

### **Estimation of annual revenue and performance evaluation of the processors**

In estimating the annual revenue and evaluating the performance of the processors in the business, three processors were selected and studied. Each of the processors represents a class of the processors in each town. These classes were determined in terms of number of tins per drum of palm fruits processed by each processor. The criterion for selecting these three processors was based on their operating capacity within the period of study. The prices used were those given by the processors at prevailing market prices as at the time of the study. Each processor carried on business for weeks in a year. The relevant data is as presented in Table 1.

From Tables 2, 3 and 4, the processors made positive profits of ₦111,120.00; ₦129,640.00; and ₦39,920.00 respectively. This could be attributed to their high level of education, good management, competence, and adequate record keeping both financially and otherwise. In spite of market fluctuation in the prices of palm produce in year under study, these processors were still in business. In order to maintain this trend of profit or more, the processors were opting for an automated oil mill instead of hand pressing machines which were labour intensive, tedious, product wasteful etc.

**Table 1.** Annual consumption and expenditure on palm fruit by the three processors.

Processors	Period of processing	Estimated quantity processed in tins/wk/yr	Total cost of palm fruit annually at N500/tin
I	6	312	156,000
II	7	364	182,000
III	5	260	130,000

Source: Field Survey, 2015.

**Table 2.** Total Cost of Production for the three Processors in a year (52 weeks).

Processors	Labour (N)	Transport (N)	Commission @ N10/tin	Firewood @ N50/bundle	4 tins of H2O N5/tin	Palm Fruit Processed	Total Costs(N)
1	31,200	15,600	6,240	15,600	6,240	156,000	230,880
11	46,800	15,600	6,240	7,800	3,120	182,000	261,560
111	16,640	13,520	6,240	5,200	2,080	130,000	173,680

Source: Field Survey, 2015.

**Table 3.** Quantities of Palm Oil (P.O) and Palm Kernel (P.K.) Produced in tins and Revenue Accrued from the Sale in a Year.

Processors	Qty of P.O. Produced/wk/tin	Qty of P.O./Yr	No of months to produce 1 tonne of P.K	Qty of P.K produced/Yr	Revenue (N)		Total Annual revenue(N)
					PK	PO	
1	12	624	4	3	30,000	312,000	342,000
11	12	624	3	4	48,000	343,200	391,200
111	4	208	1	12	120,000	93,6000	213,600

Source: Field Survey, 2015.

**Table 4.** Profits of the three processors (Profit = TR –TC).

Processors	Total revenue (N)	Total cost (N)	Estimated profit (N)
1	342,000	230,880	111,120
11	391,200	261,560	129,640
111	213,600	173,680	39,920

Source: Field Survey, 2015.

### Performance evaluation of the processors

Evaluation of the performance of the three processors was based on the above results (Tables 1 to 4). In evaluating their performance, profitability test was used. Thus:

$$\text{Profitability} = \frac{\text{Profit}}{\text{Revenue (Sales)}} \times \frac{100}{1}$$

This gives the profitability level of palm produce of the

processors as 32.5, 33.2 and 18.7% respectively. This signifies the management's overall effectiveness. It gives the final answers on how effectively the palm produce processing business could be managed.

### Estimating The Gross Margin (GM)

Gross Margin = Total Revenue (TR) – Total Variable Cost (TVC) (Table 5).

Therefore, TR = ₦946,600.00  
TVC = ₦ 666,120.00

**Table 5.** Estimated costs and returns of the three processors annually.

S/N	Total revenue (₦)	Total variable costs (₦)
1	342,000	230,880
11	391,000	261,560
111	213,600	173,680
Total	N946,600	N666,120

Source: Field Survey, 2015.

**Table 6.** Regression result of variables.

S/N	Variables	Regression coefficient		Significance level @ 5%
		bi	se	
1	Educational Background	-19.129	127.179	
2	Farming Experience	-4.206	6.221	
3	Marital Status	99.823	85.145	***
4	Household Size	-15.996	15.908	
5	Gender	92.086	128.885	
6	Age of the Farmer	11.835	5.022	***
7	Source of Finance	101.170	111.396	***
8	Source of Labour	270.806	78.798	***

\*\*\* = Significant (at 0.05 level) Source: Field Survey, 2015.

Gross Margin (GM) = TR - TVC =  
 ₦946,600.00 - ₦666,120.00 = 280,480.00  
 GM = N280,480.00

Overall Profitability is given as:

$$\frac{\text{Profit}}{\text{Revenue (Sales)}} \times 100$$

$$= \frac{₦ 280,480}{₦ 946,600} \times 100 = 29.6\%$$

Profitability = 29.6%.

Thus under the existing palm oil processing in the area, each processor on the average would have a gross margin of about 9.349.

**Regression result of variables affecting output of palm oil processing**

$$Y = a_0x_1 + a_1x_2 + a_2x_3 + a_3x_4 + a_4x_5 + a_5x_6 + a_6x_7 + a_7x_8 + a_8x_9 + e_i$$

Where Y = output of palm oil (kg)(mg).  
 x<sub>1</sub> = Educational background (years).  
 x<sub>2</sub> = Farming experience (years).

x<sub>3</sub> = Market Status.  
 x<sub>4</sub> = House Hold size (number).  
 x<sub>5</sub> = Gender.  
 x<sub>6</sub> = Sources of Finance.  
 x<sub>7</sub> = Labour (source of labour).  
 e = Stochastic Random Error.

Therefore,

$$Y = -341.66x_1 - 19.13x_2 - 4.21x_3 + 99.82x_4 - 15.99x_5 + 92.09x_6 + 11.84x_7 + 101.17x_8 + 270.81x_9 + e_i =$$

$$Y = 283.094 - 127.179 - 6.221 + 85.145 - 15.908 + 128.885 + 5.022 + 111.170 + 78.798 =$$

$$R^2 = 0.39\%, F_{cal} = 4.041$$

Table 6 shows that educational attainment, farming experience, gender and household size did not affect output of oil palm. In other words, these parameter estimates are not statistically significant at the 5 percent level of significance. On the other hand, marital status, farmer's age, labour, and source of finance are statistically significant at five percent level of significance. In other words, the later influenced the output of oil palm processing by women in the study area. Moreover, the R<sup>2</sup> of the socio-economic factors affecting the output of oil palm processing by women is 0.39 approximately. This value is rather low and shows that the independent variables (x<sub>1</sub>, x<sub>2</sub>, x<sub>3</sub>, x<sub>4</sub>, x<sub>5</sub>, x<sub>6</sub>, x<sub>7</sub>, x<sub>8</sub>, and x<sub>9</sub>) explained about 39 per cent of the total variations in the dependent variable (Y).

### Testing for the overall significance of the regression using F-ratio

The  $R^2$  of the socio economic factors affecting the output of oil palm processing by women is 0.39 approximately. This value is rather low and shows that the independent variables ( $x_1, x_2, x_3, x_4, x_5, x_6, x_7, x_8,$  and  $x_9$ ) explained about 39% of the total variations in the dependent variable (Y). Therefore, testing for the overall significance of the regression using F – ratio, the decision rule is: if  $F^*$  is less than  $F$ , we reject the null hypothesis, that is, we accept that the overall regression is not significant. Since  $F^*_{cal}$  (4.041) is less than  $F_{0.025}$  (2.17) (with  $V_1 = 8$  and  $V_2 = 51$  degrees of freedom), we conclude that; the overall regression result is significant. The  $F^*$  ratio is a test of significance of  $R^2$ . The  $R^2$  is found statistically significant. This implies that there is linear relationship between Y and X's, that is the b's are not zero.

### Constraints to palm oil processing in the study area

From the discussions above, key factors that constrain palm oil processing in the area of study are finance labour. The financial problems which the women processors are encountering in the study area include – inaccessibility of loans as well as insufficient fund to carry out production process. About 80% of the processors interviewed finance their production operations through personal savings and such could not afford to fund large scale production. There is also limited availability of labour in the study area, and the cost of obtaining their use is a course of concern to the processors especially during the stages of pounding, digestion and pressing or extraction of oil. Other constraints include some heavy machines that cannot be operated by women. Inefficient transportation network and cost of harvesting and buying of palm fruits all contribute to the increased cost of production. The roads in the study area are in a deplorable state, which makes it difficult for easy movement of the processing materials and products in and out of the processing site.

### CONCLUSION AND RECOMMENDATIONS

The primary mechanism for sustaining a long term profit without resorting to a higher food prices for consumption is increasing the productivity. In view of the problems, the observations, the prospects of palm oil processing in the study area is still bright, since from the above results, it could be seen that palm oil enterprise could be a viable venture if properly managed. In the light of the various problems or constraints to palm oil processing, the following suggestions/recommendations are hereby rendered:

1). The mechanization of major stages of operations such

as fruit digestion and oil extraction to alleviate the drudgery of female processors. This mechanization must have to be women friendly, that is easily handled by women. Also, processors should be encouraged to use these machines as this would reduce the standard day labour per operational cycle which will in return reduce labour cost. Other less strenuous tasks, such as fruit separation and fibre/nut separation can be contracted out to elderly women and unemployed youth.

2). The fact that many women face difficulties in obtaining credits to start or enlarge their enterprise is no longer in doubt. Apart from existing facilities of the National Agricultural Cooperatives and Rural development Bank (NACRDB), more accessible loan schemes exclusively for women in various tiers of government should be made available and establish a programme to monitor loan beneficiaries for repayment.

3). Provision of an enabling environment and basic infrastructures to improve on the women productive capacity. The infrastructures should include modern well staffed hospitals and Primary Health Care Centres, good feeder roads and transportation schemes, portable water project, rural electricity and storage facilities.

4). Availability of palm fruits: Though various researches, in little ways, have been carried out in the area of palm tree and palm oil processing, it is suggested that incentives be given to researchers by the government to enable them find out the possible means of having a high breed species of palm tree that could be unseasonal. When this happens, it would ensure steady availability of palm fruits throughout the year. Thus, it will go a long way to enhance palm oil production in the state.

With the dwindling fortunes from crude oil, Nigeria must re-establish agriculture as the mainstay of the nation's economy. In this context, palm production and procession must be returned to its earlier enviable position as the mainstay of economy of the Southeast of Nigeria.

### Conflict of interests

The authors have not declared any conflict of interests.

### REFERENCES

- Adetola S (2015). Palm Oil Importation: A Strategic Stabiliser for Palm Oil Industry in Nigeria. <http://www.thisdaylive.com/articles/palm-oil-importation-a-strategic-stabiliser-for-palm-oil-industry-in-nigeria/198476/>
- Ciracia B (1995). "The work done by Rural Women in Malawi" East Afr. J. Dev. 8:80-91.
- Clark G (1985). "Fishing the African Food crisis: women Food Farmers and Food Workers" UNICEF Occasional Paper No 1:12.
- Dvorak K (1996). Labor requirement in assessment of technologies. Research Guide No. 27, IITA, Ibadan, Nigeria.
- Ekong EE (2003). An introduction to rural sociology. Uyo: Dove Educational Publishers. pp. 198-207.
- Enwelu IA, Nwanegbo OA, Onoh P, Ifejika PI (2013). Challenges and Prospects of Smallholder Oil Palm Production in Awka Agricultural Zone of Anambra State, Nigeria. J. Agric. Ext. 17:2.

- Enwezor ER (1984). "Reflection on Nigerian Food crisis" (An address presented on the 9<sup>th</sup> Biennial conference of the Nigerian Association of University Women in Nsukka, 7 – 11<sup>th</sup> November).
- Ezeibe AC (2012). Women Labour Utilisation in Crop Production in Abia State, Nigeria. Unpublished PhD Dissertation submitted to the Department of Agricultural Economics, University Of Nigeria, Nsukka.
- Food and Agriculture Organization of the United Nations (1985). Women and Developing Agriculture Women in Agriculture Series No. 4. Rome: FAO <http://www.fao.org/DOCREP> (Retrieved September 18th 2015).
- FOSENET (2007). Impact of HIV and AIDS on Rural Agriculture and Food Security In Chivi and Makone Districts of Zimbabwe [http://archive.kubatana.net/docs/foodse/fosnet\\_hiv\\_aids\\_chivi\\_makoni\\_070821.pdf](http://archive.kubatana.net/docs/foodse/fosnet_hiv_aids_chivi_makoni_070821.pdf)
- Gupta R (2013). Reactivating Nigeria's Oil Palm Industry. <http://businessdayonline.com/2013/06/reactivating-nigerias-oil-palm-industry-3/>
- Jiggins JR, Samanta K, Olawoye JE (1997). Improving women farmers' access to extension services. *Improv. Agric. Ext. Ref. Man.*, 73-80.
- Kachingwe SK (1986). "Zimbabwe Women: A neglected factor in Social Development. *J. Soc. Dev. Afr.* 2(6):27-33.
- Kisseka MN (1980). "Development and Rural African Women" Paper presented at the CENSCER Conference at University of Benin, September.
- Madeley J (2010). Women Marginal Farmers – Mobilising for Change. UK: Concern Worldwide.
- Mutangadura GB (2005). "Gender, HIV/AIDS and Rural Livelihoods in Southern Africa: Addressing the Challenges. *J. Cult. Afr. Women Stud.* 7:1-13.
- Nwagbo N (n.d.), Manufacturer Plans N1.2b Oil Processing Factory in Anambra. Available at: <http://dailytimes.com.ng/manufacturer-plans-n1-2b-oil-processing-factory-in-anambra/>
- Okorji EC (1985). The role of Women in Arable cropping Enterprises in farming Communities of South Eastern Nigeria: A Case study. *Dev. Peace* 6(2):165-173.
- Olawoye JE (2001). "Contemporary Research Interests and Problem Areas in Agricultural Extension and Rural Development" The Ibadan Extension Monograph Series, No. 2, Department of Agricultural Extension and Rural Development. Ibadan: University of Ibadan. P 47.
- Omiye FS (2004). Poverty Alleviation Strategies of Rural Women in Akure North Local Government Area of Ondo State. Unpublished Postgraduate Diploma Research Project, Department of Agricultural Economics and Extension, Federal University of technology, Akure.
- Pala A (1979). African Women in Rural Development: Research Trends and Priorities Overseas. Liaison Committee Paper 12:13.
- Prakash D (2003). Rural Women, Food Security and Agricultural Cooperatives ICA-Japan Agricoops Management Training Project for Asia. Available at: [http://www.uwcc.wisc.edu/info/intl/rur\\_women.pdf](http://www.uwcc.wisc.edu/info/intl/rur_women.pdf)
- Saito KA, Weidemann CJ (1994). Agricultural extension for women farmers in Africa. Policy, Research, and External Affairs working papers ; no. WPS 398. Washington, DC: World Bank. Available at: <http://documents.worldbank.org/curated/en/963151468768706244/Ag-ricultural-extension-for-women-farmers-in-Africa>.
- Simonns EP (1976). Economic Research on Women in Rural Development in Northern Nigeria. Overseas Liaison Committee paper, No 10.
- Spencer DSC (1976). African women in agricultural development: a case study in Sierra Leone, American Overseas Liaison Committee Paper No. 9, Washington, DC.
- Steady FC (1985). African Women at the End of the Decade. *Afr. Rep.* 30(2):4.
- Usoro EJ (1974). The Nigerian Palm Oil Industry. Ibadan: University Press. 1-3.
- World Bank (1989). Women and Development: Issues for Economic Analysis". Working Paper No. 269, Washington, DC: World Bank.



# Journal of Development and Agricultural Economics

## Related Journals Published by Academic Journals

- *Journal of Plant Breeding and Crop Science*
- *African Journal of Agricultural Research*
- *Journal of Horticulture and Forestry*
- *International Journal of Livestock Production*
- *International Journal of Fisheries and Aquaculture*
- *Journal of Cereals and Oilseeds*
- *Journal of Soil Science and Environmental Management*
- *Journal of Stored Products and Postharvest Research*

**academicJournals**