Profitaility and Factors affecting the Performance of Oil Palm Processors in South West, Nigeria

Bankole, A. S., Garba, I. D., Omofonmwan, E. I., Okere, R.A. and Ojemade, C. A.

Agricultural Economics Division, Nigerian Institute for Oil Palm Research (NIFOR), PMB-1030, Benin City, Edo State, Nigeria

KEYWORDS

Affecting,
Factors,
Oil palm,
Performance,
Processors

ABSTRACT

This study evaluated the profitability and determined factors affecting the performance of oil palm processor in South West, Nigeria. Primary data were collected from two hundred and seventy-five (275) oil palm processors with the aid of structured validated questionnaire through a multi-stage sampling procedure. The data collected were analyzed using Seemingly Unrelated Regression Equation (SURE) and Budgetary Technique. The result revealed that the gross margin and profit of ₦498,534.6 and ₦357,367.9 respectively indicated that oil palm processing business was profitable. The Return on Investment (ROI) value of 1.63 showed that the processors had better performance. SURE, analysis showed experience and household size to be positively and significantly associated with profit while age, depreciation cost, labour cost and transportation cost showed inverse relationship with profit. On the other hand, education and experience showed positive and significant association with return on investment (ROI) while age, household size, depreciation, labour cost and transportation cost had a negative relationship with ROI. It is therefore, recommended that there should be policies which focus on education of processors that will promote performance in the oil palm processing business and extension training services that will enhance the processors experience in order to have a better performance.

*CORRESPONDING AUTHOR

ajsbankole@gmail.com

INTRODUCTION

Agriculture is an important tool for economic advancement of any developing country like Nigeria. It allows the sustainability of the economy if impart in right direction and appropriate tools are utilized in the processing of agricultural produce. According to Agwu *et al*. (2017) **a**gricultural development along the value chain paves way to poverty alleviation through provision of job opportunities and comfortable lives for millions of people. Nigeria is an agrarian country and agriculture is the backbone of its economy during the colonial and pre-colonial period. The potential of palm oil as the most promising product for the Nigerian agricultural sector and industry encourages and enhances the involvement of both men and women in its processing (Raney *et al*., 2011**)**. Palm oil processing forms major source of income and employment to a large proportion amongst the poor rural population in Nigeria, especially in Southwest (Olagunju, 2008).

Palm oil is very important as its serve as an income generator for processors in Nigeria. In most cases it is women who are in charge of processing the oil palm fruits into palm oil and selling the product in the local and even international markets. The lack of proper scaling of locally fabricated milling technology adversely affects the extraction rate and volume of palm oil production. Ukpabi (2004), stated that the success or failure of palm oil processing depends largely upon how labour and other resources are efficiently used and that an efficient processing technology increases quality and quantity of palm oil available for consumption. Agboola (1993) and Omoti (2001) added that for the processing techniques to be termed efficient, they should satisfy the need of meeting both growth and sustainability goals in the industry. In contribution, Jalami *et al.,* (2000) advocated that oil palm processors should embrace well integrated capital intensive, high volume and high extraction rate in the processing method in order to encourage high transformation of palm oil industry in the country. According to Inyiama *et al*., (2011), several efforts are being made by researchers to involve the ideal palm fruit processing machine in processing.

It is believed that oil palm processing could be more rewarding if the palm fruits is processed into palm oil instead of selling as fruits. Though, the method of processing is tedious, the gains from the products (palm oil, palm kernel and fibers) compensate the processor for the labour (Ukpabi, 2004; Ini-mfon *et al*., 2013)

There is dearth of information on past works on profitability and factors affecting performance of oil palm processors. There are few detailed studies (Omoti, 2001; Omoti, 2004; Olagunju, 2008) on palm oil processing that have relevance to the subject examined in this work. However, it would be wrong to continue to rely on past results for present decisions and policies since natural and socio-economic factors e.g. weather parameters, farmers' potential and ability to manage resources under emerging technologies which influence input output relationship change overtime (Ojemade, 2008).

Due to the reawaken curiosity in oil palm in recent years, it is necessary to evaluate the cost and returns on oil palm processing and also analyze the factors affecting the performance of the oil palm processors. This will help to improve food security and livelihood. Therefore, the objectives of this paper were to evaluate the cost and returns of oil palm processors and also determine the factors influencing the performance of the oil palm processors.

METHODOLOGY

This study was carried out in Southwest geopolitical Zone of Nigeria, which lies between latitude 6^{o} to the North and 4^{o} to the South. It is marked by longitude 4^{o} to the West and 6^{0} to the East. It covers a land area of about 114,271 kilometres square representing 12% of the country's land mass. The total population is about 27,581,992 and more than 96% of the population is Yoruba (NPC, 2006). The Zone comprises six (6) States: Oyo, Osun, Ogun, Ondo, Ekiti and Lagos. It is bounded in the North by Kogi and Kwara states, in the East by Edo and Delta states, in the South by the Atlantic Ocean and in the West by the Republic of Benin.

The climate is tropical and characterized by bi-modal rainfall pattern. The raining season, commonly referred to as the cropping season starts from late March and ends in October every year. This is followed by a short break, then the dry season, starting from November to early March. The mean annual rainfall ranges from 800 mm in the derived savannah zone to 1500mm in the rainforest zone, while the mean annual temperature varies from 21.1^{o}C to 31.1^{o}C. The vegetation is mostly rainforest. Agriculture is the main occupation of the people and the notable food crops cultivated annually include: cassava, maize, cowpea, rice, sorghum, millet, yam, and banana, while the cash crops: are cocoa, oil palm, rubber, coffee, kola nut among others.

The study adopted a multi-stage sampling procedure. The first stage involved purposive selection of Ondo and Ekiti States out of the six States in Southwest, Nigeria, based on the predominance of oil palm processing enterprises. The second stage involved purposive selection of four (4) Local Governments Areas (LGAs) based on concentration of oil palm processing enterprise from each State. The LGAs were, Okitipupa, Irele, Akure North and Ifedore in Ondo State and Gbonyi, Ise, Emure and Ikere in Ekiti State. The Third stage involved purposive selection of four (4) oil palm dominated processing communities from each LGA., namely: Ominla, Ayeka, Lepa, Iju-Odo(Okitipupa), Ijosu, Ajagba, Ode-Iyasan, Ruwahe (Irele), Ogbese, Oke-odo, Iju, Agopanu (Akure north), Abaoyo, Ajagboto, Okoyelori, agbasa (Ifedore), Emure, Eporo, Igbo-oge, Akeye (Emure), Ogbese, Obada, Afolu , Ekemode (Ise), Aisegba Ode, Iluomoba, Agbado Ekiti (Gboyin), Para, Okeosin, Anoye, Agbado Oyo (Ikere), 10 respondents were randomly selected from each community. This gives a total sample size of 320 oil palm processors but only 275 was valid for the analysis of this study.

Primary data was used for this study. The primary data was collected through Personal interviews and the use of well-structured questionnaire to obtain information from the oil palm processors. The information that was generated through the questionnaire included variables on the socio-economic characteristics of oil palm processors (age, sex, educational level, processing experience, household size, source of capital,), input used (water, number of bunches processed/year, labour, machine/equipment, diesel) the output of production (litres of oil palm produced/metric tonnes).

Budgetary Technique

The budgetary technique was used to determine the cost and returns from oil palm processing. Costs and returns were estimated on output within a production season of 2019. Variable costs include: costs of FFB, labour, picking, slicing, threshing, sieving, boiling, digestion, offloading, water, firewood, rubber, basket, transportation, annual rent, and diesel, while the fixed cost include: costs of equipment such as digester, broiler, presser, axe, cutlass, wheelbarrow, separator, filter, basin, shovel and cracker.

The equations of the budgetary analysis are stated as:

GM =TR – TVC ……(1)

NI=TR–TCP=GM–TFC …… .(2)

ROI=TR/TCP ……(3)

ESR=TFC/TVC ……(4)

GR = TC/TR ……..……..(5)

Where; TR = Total revenue, P= Price (Naira), Q = Quantity of oil palm (litre), TCP = Total cost of processing, TVC = Total variable cost, TFC = Total fixed cost, GM= Gross margin, NI = Net income, ROI =Return on Investment, ESR = Expenses Structure Ratio, and GR = Gross Ratio

Seemingly Unrelated Regression Equation (SURE)

Seemingly Unrelated Regression Equation (SURE) was used to determine factors affecting the performance of the processors. (Objective 2). As specified below

$$Y_i^* = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, \varepsilon_i) \quad \text{……...……(6)}$$

Where ,*Y = the dependent variables and they are Y_a, and Y_b for profit, and ROI respectively, X_1 = Age, X_2 = Education, X_3 = Household size, X_4 = Marital status, X_5 = depreciation on fixed input, X_6 = Experience, X_7 = Labour cost, X_8 = Transportation cost, ε_i = error term and $\beta_{1\text{-}8}$ are estimated parameters.

RESULTS AND DISCUSSION

Costs and Returns Analysis

Table 1 revealed the budgetary analysis of the oil palm processors, which comprises total revenue and total cost of processing. The total cost of processing comprises total fixed cost and total variable cost. The total fixed cost (TFC) incurred by the processors was ₦141,166.61. The TFC values for the respondents formed 24.70% of the total cost of processing (TCP) respectively. The mean TFC was ₦141,166.6. The mean total variable cost (TVC) incurred by the processors was ₦430,433.06, as the values accounted for 75.30% of the total cost of processing. The total revenue was 928,967.63. the profits were ₦357,367.9. The mean gross margin and profit of ₦498,534.6 and ₦357,367.9 indicates that oil palm processing business is a profitable business. ROI value for processors was 1.63 meaning that processors had better performance. The value of Expense Structure Ratio (ESR) of 0.33 indicated that the variable cost incurred in the business is greater than money expended on fixed cost by 67%. The value of gross ratio (0.62) also revealed that total revenue accrued from oil palm processing is greater than the total cost expended in the course of the business by 38%. All these profitability measures confirmed and reiterated the profitability of oil palm processing.

Table 1: Results of Cost and Returns of Oil Palm Processing

ITEMS	MEAN	PERCENTAGE
Annual rent on land	103,529.87	18.11
Picking cost	69,777.66	12.21
Slicing cost	5,971.16	1.04
Threshing cost	4,725.83	0.83
Sieving cost	5,331.90	0.93
Boiling cost	6,746.77	1.18
Digestion cost	5,224.60	0.91
Offloading cost	8,169.03	1.43
Water cost	11,454.49	2.00
Firewood cost	6,525.89	1.14
Kerosene cost	10,078.18	1.76
Basket cost	4,501.27	0.79
Transportation cost	92,522.60	16.19
Diesel cost	6,099.32	1.07
FFB Cost	27,060.07	4.73
Total labour cost	57,425.27	10.05
Total Variable Cost	430,433.06	75.30
Depreciation cost on equipment	141,166.61	24.70
Total Fixed Cost	141,166.61	24.70
TCP	571,594.67	
TR	928,967.63	
GM	498,534.57	
Profit	357,367.97	
ROI	1.63	
ESR	0.33	
GR	0.62	

Source: Computed from Field Survey Data, 2019

Determinant of Factors Affecting the Performance of Oil Palm Processors

The results of the Seemingly Unrelated Regression Equation (SURE) in determining factors affecting the performance of oil palm processors is presented in Table 2. Generally, the coefficients of variables that were positive with the regressands (i.e. profit and Return on Investment) imply that increase in the value of any of these variables will increase and have upward relationship with the dependent variable and vice-versa.

RESULTS

The chi-square statistics showed 55.87 for profit, 44.43 for ROI and are significant at 1% level. This implies that the null hypothesis of the restrictions of valid homogeneity and symmetry for the system equations were accepted. According to Table 2, the result showed that coefficients of age of the processors was negatively related with the regressands and were all statistically significant at 1% level. This implies that older oil palm processors had their profit reduced by ₦99.18. The ROI value revealed that for every naira invested by the processors, ₦0.06 was lost from the oil palm processing business

The coefficient of year of education was negatively related with profit. Also, the result showed that education is statistically significant at most 10% level with ROI. This implies that advancement in educational attainment will cause a positive increase in the value of ROI of which 10kobo will be earned on every naira expended in the enterprise.

Coefficients of Household size had positive relationship with profit and statistically significant at 5% level. The results showed that a unit increase in the number of family size will increase profit by ₦288.69.

The coefficient of experience was positive and statistically significant with the dependent variables. The results showed that an increase in the years of experience will increase profit by ₦125.77. The ROI value revealed that for every naira expended by the processors, ₦0.07 was gained from the oil palm processing enterprise.

Coefficient of labour cost showed a negative association with profit and ROI. This implies that for every naira expended on labour the ROI is reduced by 0.0000056.

The transportation cost of processing oil palm had a negative coefficient with the dependent variables and statistically significant at 5% and 1% level ($P < 0.05$) for profit and ROI respectively. This is an indication that a naira increase in the transportation cost will reduce profit by ₦0.76.

Table 2: Results of Seemingly Unrelated Regression Model on Factors Affecting performance of the processors

Variables	Profit		ROI	
Age	-99.18***	(0.000)	-0.06***	(0.000)
Education	-34.36	(0.669)	0.10*	(0.063)
Household	288.69**	(0.012)	0.08	(0.337)
Marital status	-151.78	(0.922)	-0.15	(0.889)
Depreciation	-3.59***	(0.005)	-9.11e-06	(0.303)
Experience	125.77***	(0.002)	0.07**	(0.020)
Labour cost	-0.53	(0.268)	-5.56e-06*	(0.094)
Transport cost	-0.76**	(0.003)	-6.86e06***	(0.004)
Constant	367.02	(0.295)	4.08	(0.096)
Chi-square	55.87***		44.43***	

Source: Computed from Field Survey, 2019. Significant at***1%, **5%, *10%

CONCLUSION AND RECOMMENDATIONS

The study evaluated the costs and returns on oil palm processing and factors affecting the performance of oil palm processors in Southwest, Nigeria. The analysis of the cost and return indicated that oil palm processing business is profitable. The Return on Investment (ROI) showed that the processors had better performance. SURE, analysis showed that experience, household size, age, depreciation, and transportation cost were significantly associated with profit. On the other hand, education, experience, age, depreciation, labour cost and transportation cost were significantly associated with return on investment (ROI). Hence these variables affect the performance (profit and ROI) of oil palm processors.

Therefore, there should be policies which focus on education of processors that will promote performance in the oil palm processing business. Government should set up extension training services that will enhance the processors experience and the adoption of labour saving processing techniques in order to have a better performance. Government should also provide good feeder road to enable processors transport the palm fruits for processing at a minimal cost.

REFERENCES

Agboola, A.A. (1993). Farming systems in Nigeria. In fundamentals of Agriculture Edited by E. A. Aylari, M. O. Abatan, E. O. Lucas and O. A. Akinboade. http//www.ijaerd.lautechaee.edu.com

Agwu, N. M., Oteh, O. U. and Amama, G. C. (2017). Gender Differentials in Profit among Oil Palm Processors in Abia State, Nigeria. *Journal of Gender, Agriculture and Food Security*, *2* (2): 23-32.

Ini-mfon V. P., Sunday B. A., Samuel J. U., Daniel E. J. and Ubong E. E. (2013). Factors Affecting Performance of Palm Oil Processors in the South-South Region of Nigeria. *International Journal of Agricultural Economics and Extension*. *1* (4): 17-23.

Inyiama, H.C., Okezie, C.C. and Okafo, I.C. (2011). Digital control of palm fruit processing using ROM Based Linked State machines. European Journal of Scientific Research ISSN1450 -216, 59(4): 1-9 © EuroJournals.Publishing, Inc 2011

Jalami, B.S., Ariffion, D. and Chan, K.W. (2002). Malaysia's contribution to improving the value and use of palm oil through modern technologies in Burotrop Bulletin 19 p.25.

NPC (National Population Commission) (2006). Nigerian Census Reports: In Akinlade, R. J., Balogun, O.L., Obisesan, A. A. Commercialization of Urban Farming: The Case Study of Vegetable Farmers in Southwest Nigeria. Invited Paper Presented at the 4th International Conference of the African Association of Agricultural Economics, September 22-25, Hammamet, Tunisia. pp.1-15.

Ojemade, C.A. (2008). Economics of Adoption of some recommended oil palm production technologies in Ethiope West local Government Area of Delta State. MSc Thesis submitted to the Department of Agricultural Economics, University of Nigeria, Nsukka.

Olagunju F.I. (2008). Processing of palm oil in South Western Nigeria. *International Journal of Agricultural Economics and Rural Development*, *1*(2): 69 – 77.

Omoti, U. (2001). The future of the oil palm industry in Africa and strategies for Development. The Nigerian situation". Paper prepared for the Africa Development Bank (ADB) workshop on the future of oil palm industry in Africa and strategies for Development Cote D' Ivoire.

Omoti, U. (2004). Problems and prospects of oil palm Development processing and potentials in Nigeria, paper prepared for African Investment and Development Agency Conference on attracting private Foreign investment into Nigeria's oil palm industry, Kuala Lumpur, December, 2004.

Raney, T., Anríquez, G., Croppenstedt, A., Gerosa, S., Lowder, S., Matuschke, I. and Skoet, J. (2011). Gender Differences in Assets. ESA Working Paper No. 11-12. http://www.fao.org/docrep/013/am317e/am317e00.pdf as. As retrieved 03/09/2018.

Ukpabi, U.J. (2004). Sustainable post-Harvest Technologies for Major Food Crop and Flesh. A paper presented at the workshop for Abia State Agricultural Officers. NRCRI, Umudike. 10 -12th May. pp. 1 –13.