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Resource Use Efficiency In Oil Palm Production In Akwa Ibom State, Nigeria

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ABSTRACT

This study determines the resource use efficiency of oil palm production in Akwa Ibom State, Nigeria. The population of the study comprises oil palm tree farmers. Multistage sampling technique was adopted to select 105 respondents. Primary data were obtained using a well-structured interview schedule while descriptive and inferential statistics were used for the analysis. The descriptive statistical tools such as mean, frequency distribution, table, percentages, were used to present the socio-economic characteristics of the respondents. The inferential statistical tools; budgetary analysis and regression analysis were employed to measure the profitability of oil palm production and dependence of oil palm output on various inputs used respectively. The result of the findings revealed the socio-economic characteristics of the respondents in the study area as follows; 76.0% were male, 65.3% were within the age range 30-40 years while, 91.2% were married and 77.6% of the respondents had primary and secondary education. The results also revealed that although semi- mechanized palm oil processors were not fully economically efficient in the use of resources, but was still more profitable relatively. Palm oil processors should therefore adopt good management strategies and practices in order to ensure efficient utilization of existing and available resources. Majority of farmers inherited their land while some purchased, and other got it through contract .

Key Word: ***Resource, Efficiency, Profitability, Efficient Utilization, Processors***

INTRODUCTION

The oil palm (*Elaeis Guinersis*) is a native of West Africa. Many reports cited Nigeria as one of the country where oil palm was first domesticated before the 14th century (www.org/docrep). Predominantly oil palm trees are found in the Southern part of the country Nigeria mostly in the war rain forest and Savanna belt. (www.ippanigeria.org). according to (Matthew *et al.;* 2009), Nigeria was producing palm oil sold in the world market and it was a dominant source of foreign exchange in the early 1901; even till 60s, Nigeria was the world's largest producer of palm oil accounting for 43 percent of global palm oil production (Olagunji, 208). Though the production was increasing during that

period, it was not increasing at a rate that could meet up with rising global demand and consumption. Production sluggishly increased from 640,000 tons in 1975 to 890,000 tons in 1995. (FMA, 2010 and OPEKE, 2005). It is now the third largest producer after Indonesia and Malaysia with an annual production volume of 1.28 million metric tons (NIFOR, 2008). The oil palm sub-sector of Nigeria agriculture presented itself as a potential productive sector that could be used to diversify the economy after years of neglect. The non-participation of Nigeria in oil palm plantation development until the late 2000 and government policy on plantation development are most certainly reasons for Nigeria losing her leading position to Malaysia whose total production are export oriented (Green, 2003). Nigeria oil palm production fell, and by 1999 only 10% of the total value of our annual exports remains. In the past, the Nigerian government had tried to implement large-scale oil palm plantations, most of which resulted in complete failures. The Cross River State palm projects of the 1960's and the 1990's European Union-funded "Oil palm belt rural development programme" was abandoned in 1999 and reactivated in 2003 and the local governor's intention to privatize it was announced in 2010 (WRM, 2010).

The World Bank played an important role in the promotion of the oil palm business in Nigeria. According to a recent World Bank document, Nigeria has been "the second largest recipient of World Bank palm oil sector projects, with six projects over the 1975 to 2009 period (WRM, 2010). The palm oil from the eastern region was described as being of the highest quality and the people took pride in the work of their hands. The people were so good at it that the Malaysians like the three wise oriental kings followed the scent of the palm oil to Imo state to learn the fine art of palm oil production. However, with the crude mineral oil boom, laziness and indolence took the place of hard work and dignity of labour.

Agriculture suffered a setback as it was relegated to the back burner. Between 2003 and 2005 Nigeria lost her leading place in palm oil export to Malaysia and Indonesia and regained it temporarily between 2005 and 2008. In 2004, according to reports, Indonesia cultivated oil palm plantations which covered 5.3 hectares of land. These plantations generated 11.4 million metric tons of palm oil with an export value of US$ 4.43 billion and brought in $42.4 million to the Indonesian treasury. Of course since then, the value of the product has continued to climb, making it almost competitive to petroleum. Kei et al. (1997) highlighted that the stagnation in the oil palm sector in Nigeria was influenced by the overall agricultural policies that could be classified into three periods visa, namely, the independence (1960-1970), the oil export boom period (1970-1985), the appreciation of the Naira and the reduction of duties on food imports made food imports cheaper than domestic staples (Nwauwa, 2011). These actions created biases against agricultural exports (Forest, 1993). During the sap period (1993-2003) on the positive side there was a rise in output prices, improvement in production efficiency and on an increase, in opportunities for small business enterprises. On the negative side however, it led to increased input prices and a sharp increase in the cost of living relative to nominal income (CBN/NISER, 1992) so, national-level consumption has declined following sap implementation.

The broad objectives of the study was to estimate the resource use efficiency of oil palm production of Akwa Ibom State, Nigeria.

METHODOLOGY

Study Area

The study was carried out in Abak agricultural zone of Akwa Ibom state, Nigeria. It is located in the coastal southern part of the country, it covers a total land area of 7249km2 (Aks1989). The state lies between latitude 4'32 and 5'33 north, and longitude 7'35E and 8'253 eastward, a total population of 4931019 people (Aks1989).the state is boarded on the east by the cross River State, on the west by River State and Abia state and on the south by the Atlantic Ocean and the southern most tip of cross river. Akwa ibom state has 6 agricultural zones which are: Abak, Uyo, Oron, Ikotekpene, Eket, and Etinan Agricultural zones. Abak agricultural zone consists of 5 local government areas which are: Abak, Oruk Anam, Etim Ekpo, Ika and Ukanafun.. There are 9 blocks which cut across the 5 local government areas with about 56 cells (villages).

Sampling Techniques.

A two stage sampling techniques was used for the study. The first stage, random sampling technique was used to select 2 cells from each of the 9 blocks in the zone, the rationale here is to ensure that all the blocks are represented. In the second stage, systematic technique was used in the selection of 5 farming households with particular focus on the household head in each of the selected cells. This sum up to 10 farming households heads from each blocks. Therefore, a total of 18 cells and 90 respondents

Analytical Technique

Several descriptive and econometrics tools was used to analyze the stated objectives,

Objective 1: Socio–economic Characteristics of Oil Palm *Farmers in the Study Area.*

This objective was analyzed using descriptive statistics consisting of percentage, tables, mean, charts and frequencies.

Objective 2: To Assess the Relationship Between Inputs used and Output Received From Oil Palm Propduction in the Study Area

This objective was partly analyzed using estimate of stochastic cobb douglass production function. Implicitly, the Cobb Douglas production function is specified as thus;

CAO= F (LAN, HHL, FER, CAS,CAP, MAN)……...(3.1)

Note, variables are expressed in logarithm.

Explicitly, it is shown as thus;

Log CAO = δ_O+$\delta_1$loglan +$\delta_2$logHhl +$\delta_3$logHil +$\delta_4$logFer +$\delta_5$logCas +$\delta_6$logCap+$\delta_7$logMan + (v_1-u_1)…….(3.2)

Where,

CAO=Output of oil palm measured in (kg)

LAN=land size of the farmer measured in hectare

HHL=Household labor (man-days)

HIL= hired labor (man-days)

FER= Quantity of fertilizer (kg)

CAS=Oil palm bunches (kg)

CAP=Value of farm capital (Naira/kg)

MAN-Quantity of manure measured in (kg)

(vi-ui)= composite error term.

Note, the average physical products (APP), marginal physical product (MPP) and elasticity of production (EP) with respect to each factor was estimated and also used to analyze this objective.

DECISION RULE

If r = 1: Resource is efficiently utilized

r > 1: Resource is underutilized

r < 1: Resource is over utilized

Economic optimum takes place where MVP= MFC. If r is not equal to (1). It suggests that resources is not efficiently utilized. Adjustment could be therefore made in the quantity of input used and costs in the production process.

Determining Technical Efficiency of Resource Use

The elasticity of production which is the percentage change in output as a ratio of a percentage change in inputs is use to calculate the ratio of return to scale which is a measure of a firms success in producing maximum output from a set of input (Coelli and Batesse, 1996)

Ep = Mpp/ App

Where:

Ep = Elasticity of Production

Mpp = Marginal Physical Product

App = Average Physical Product

If

EEP = 1: Constat Return to Scale

EEP =< 1: Decreasing Return to Scale

EEP => 1: Increasing Return to Scale.

RESULTS AND DISCUSSION

Analysis of the result in Table 1 : shows that all parameters estimated carry a positive sign, which implies Hired labour (X2) Family labour (X3), farm size (X1), Chemical (X4) all have direct relationship with farmers output in palm oil production. The t - ratios shows that hire labour (X2), farm size (X1), and chemical (X4) and stands (X5) are all significant at 1%, 5% and 10% respectively. The F-value 23.443 shows that all the explanatory variables taken together have a significant effect on dependent variables. (Y). while. R2

Table 1 Regression Estimate for Palm Oil Production

Variales	Estimated Parameters	Cofficients	Standard Errors	T- Valve	Significant Level
Constant	**X0**	**0.094**	**4.012**	**-0.543**	**0.864**
Farm Size	**X1**	**-1.703**	**0.546**	**2.430**	**0.0123****
Hired Labour	**X2**	**0.764**	**0.674**	**0.037**	**0.854**
Family Labour	**X3**	**0.054**	**0.231**	**-0.263**	**0.065*****
Chemical	**X4**	**-3421**	**0.432**	**0.439**	**0,024****
Stands	**X5**	**1.258**	**0.342**	**4.84**	**0.004***
Fertilizer	**X6**	**0.134**	**0.324**	**0.312**	**0.743**

R2=0.846

F- Value =24.342 ;N = 82

Source: Field Survey 2019

while. R2 value of 0.829 implies that 85 percent of the variation in the dependent variable has been explained by the independent variables such as hired labour (X2), farm size (X2), chemical (X4) and stands (X5) while the remaining 85 percent due to random variable.

The result indicates that the coefficient of the hired labour was positive and significant at 5%. This contradicts with the a priori expectation. The positive coefficients of the cost of hired labour suggest that the higher the cost of hired labour the more palm oil farmers obtain liters of palm oil production. The coefficient of the farm size was positive and significant at 10%, this suggest that as size of palm oil farm increase, the outputs increase. This is plausible; because farmers who cultivated large hectares of land obtain higher output on their farms than those with small farm size. The coefficient of the chemical was negative and significant at 5%. This suggests that lower the amount spent on purchasing chemical by the farmers the higher the output obtain in other words the lower the quantity of chemical such as insecticides thus the higher output. The coefficient of the stand was positive and significant at 1% level respectively.

The total sum of the elasticities of production of the resources is 4.294. This implies that a 1 percent increase in the quantity of the variables will result in 4.294 percent increase in palm oil output. This indicates an increasing return to scale which is characteristic of stage 1 of the production function. This further suggests that the resources taken together are at present, been under-utilized and so farmers can have more returns by increasing the quantities of these resources. Measures of technical efficiency of resource use such as marginal value product (MVP) and marginal factor cost (MFC) were derived.

Table 2: Resource Use Efficiency, Elasticity of Production and Scale in Production

Resources	MVP	MFC	MPV/MFC	Elasticity of Production
Farm Size X1	4,860.8	4,100	1.185	1.08
Family labour X2	3,670.5	3,200	1.147	0.047
Hired labour X3	4,700.4	3,600	1.305	0.312
Chemical X4	6,400.3	5,900	1.084	0.284
Stands X5	5,200.6	4,800	1.083	2.537
Fertilizer X6	8,600.3	7,500	1.147	0.034
Return to scale (Total)			4.294	

Source: Field Survey 2019

Table 2 further reveals that the ration of the MVP to the MFC were greater than unity (1) for all the inputs. This implies that input such as labour, farm size, chemical, seeds and fertilizer were under-utilized. This means that palm oil output was likely to to

increase and hence revenue if more of such input (labour, farm size, chemical, stands and fertilizer) had been utilized.It should be noted that the MVPs of hired labour, family labour, farm size, chemical, seed and fertilizer were not negative indicating that palm farmers' rational range even though they were optimally used.

Table 2 Showing constraints

CONSTRAINTS	RESPOND	PERCENTAGE.
Inadequate production plant	Yes(63)	76.8
	No (19)	23.2
Inadequate finance and credit facilities	Yes (69)	84.15
	No (13)	15.85
High cost of inputs	Yes(63)	76.83
	No (19)	23.17
Health problem	Yes(54)	65.85
	No (28)	34.15
Lack of market	Yes (61)	74.4
	No (21)	25.6
Lack of storage facility	Yes (51)	62.2
	No (31)	37.8
Lack of oil palm fruits	Yes (55)	67.1
	No (27)	32.9
Poor education background	Yes (15)	18.3
	No (67)	81.7
Lack of extension agents	Yes (71)	86.6
	No (11)	13.4
No cooperative	Yes (67)	81.71
	No (15)	18.29
Poor transportation network	Yes (75)	91.5
	No (07)	8.5
High cost of labour	Yes (58)	70.7
	No (24)	29.3
Multiple taxation	Yes (77)	93.9
	No (05)	6.1

Source : Field survey,2019

The result from table above shows the constraints faced by the oil palm producers in the study area. A two point likert scale was used to determine the major constraints. The result reveals that the major constraints were: multiple taxation and poor transportation network with percentages: (93.9%),(91.5%). (93.9%) respondents agreed that multiple taxation was one of the major constraints faced by the respondents, while (6.1%) disagreed.

This implies that multiple tax was the most serious problems faced by the farmers in the study area. (91.5%) respondent also agrees that poor transportation is also one of the major problems faced by the respondents and (8.5%) respondents disagreed to this, this implies that poor transportation network was also a severe problem. Similarly, lack of extension agent, inadequate finance and credit facility, No cooperative. Were problems as well, (86.6%) respondents agreed that lack of extension agent is one of the problems while (13.4%) respondents disagreed to it. (84.15%) of the respondents agreed that inadequate finance and credit facilities was one of the problems while (15.85%) disagreed to it. (81.71%) of the respondents agreed that no cooperative was one of the problems while (18.29%) disagreed to it. Also, inadequate production plant, high cost of inputs, lack of market, and high cost of labour were also problems. Inadequate production plant had 76.8% respondents agreed to it as a constraint while 23.2% disagreed to it, 76.2% respondents agreed that high cost of inputs was a problem while 23.17% disagreed to it . 74.4%respondents agreed to the fact that lack of market was a constraint to oil palm producing business in the study area while 25.6% of the respondents disagreed to it. 70.7%respondents agreed that high cost of labour was one of the problems while 29.3% disagreed to it.

CONCLUSION

The present investigation was under taken with a view to analyzing the critical issues relating to resource use efficiency in oil palm oil production in Akwa Ibom state, Nigeria. The results on the determinants of net return showed that extraction cost, cost of palm fruits are positively and significantly associated with the net return while depreciation of tools and other inputs were negatively but significantly related with the net return. Palm oil processing or extraction has been an age old trade in the State; however, much improvement has not been recorded in terms of processing technology and output. There is a general inelastic respond of outputs to input application and consequent profit is low however, it has been a source of employment to many despite been a rural based enterprise. The introduction and wide use of the hybrid species that have higher oil output and use of better and modern production methods will increase output and profit margin and make the trade more attractive and rewarding.

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