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Influence of Socio-Economic Variables on Palm Oil Production in Central Agricultural Zone of Delta State, Nigeria

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Abstract
The influence of socio-economic variables on palm oil production in Central Agricultural Zone of Delta State, Nigeria was investigated. Structured questionnaires were used to collect data from 100 respondents, using multistage and random sampling techniques. Non-parametric and parametric statistical tools, including mean, frequency count, percentage, and multiple regression, were used to analyze the data. 74 % of the respondents were females, aged 50-59 years; most of them (68 %) were literate; average household size and production experience were 6 persons and 13.2 years, respectively. 72 % of the respondents earned ₦76,000 and above per year. Majority sourced fund for financing their palm oil production through personal savings. Net production income was statistically and significantly influenced by household size and years of experience. Palm oil production was seriously constrained by lack of capital, high cost of labour, and high cost of palm fruits due to scarcity. Policy to mitigate the problem of lack of capital, such as the provision of soft loans, will enable the producers increase output in order to meet the increasing demand for palm oil.
Keywords: Socio economic variable, palm oil, net production income, quantitative methods.

Introduction

Oil palm is one of Nigeria's most important food and cash crops. Palm oil, which is the major product of oil palm, has several applications. It is one of the preferred sources of fats and oil for rural and urban consumers. Palm oil is rich in carotene - a precursor of vitamin A that is essential for good nutrition. It is also used in the manufacture of soaps and other detergents [1]. Palm oil has been classified as the second most important vegetable oils consumed in the world, after soybean oil. [2] However, the production of palm oil in Nigeria has, in recent time, been relatively low, compared to the demand. This has been attributed mostly to the increasing population of the city dwellers [3]. The United Nations Industrial Development Organization (UNIDO) [4] shows that the quantity of palm oil produced in the country was at one time more than that produced in the rest of West Africa. Up to 1965, Nigeria was the largest world exporter of palm oil and palm kernel. Nigeria's export of palm oil and palm kernel constituted 21% and 50%, respectively of the total world exports of the commodity between 1963 and 1965. The report further showed that between 1980 and 1984, the country's palm oil and palm kernel export earnings fell from 39.9% to 16.8 %. This fall may be due to the discovery of crude oil in Nigeria in the early and mid-sixties. Most of the plantations were neglected and consequently, Nigeria dropped out from the list of world exporters of palm produce.

Ukpabi [5] observed that other problems that might have contributed to decreasing production output include low income of the producers, use

of outdated equipment, scarcity of water, erratic power supply, and high cost of labour. In order to overcome these problems and increase the productive capacity of the farmers, the Nigerian government instituted the Oil Palm Rehabilitation Programme (OPRP) in the early 1980's under the Ministry of Agriculture and Natural Resources and specifically, under the Small-holder oil palm Management Unit (SMU) which is responsible for implementing the OPRP. The OPRP was designed to encourage farmers to move away from traditional oil palm production and processing technologies to improved technologies that would increase yield and quality of the product and at the same time alleviate poverty. The improved technologies recommended for adoption were sourced from research findings of the Nigerian Institute for Oil Palm Research (NIFOR). The improved technologies included the use of improved varieties, application of inorganic fertilizer, insecticides and herbicides, planting of leguminous cover crops, ring weeding and pruning practices. Also, in order to improve extraction efficiency and increase palm oil processing, three types of mechanical processing techniques were recommended. They included the screw press, the pioneer oil mill and the hydraulic press [6].

Adakaren and Orewa [1] pointed out that with the scarcity and soaring demand for palm oil and other related palm oil products, improvement in the production, processing and marketing of palm oil cannot be over emphasized. It is important to note that various presidential initiatives on some crops, including oil palm and palm oil products, have improved production considerably. Nevertheless, there still appears to exist inadequate production and distribution formulae for the product. In addition, the producers of palm oil in Nigeria and Delta State, in particular, seem not to be reaping the full economic benefits of the product as majority of them still remain in abject poverty and unable to expand their business frontier. Against these backdrops, this study sought to describe the influence of some socio-economic variables on palm oil production in Delta Central Agricultural Zone. Specifically, the objectives are to: (i) characterize the respondents in the study area; (ii) determine the sources of fund and type of labour used; (iii) ascertain the influence of some socio-economic variables on net income of the producers; and (iv) identify problems militating against palm oil production.

Materials and Methods

The study was conducted in Central Agricultural Zone of Delta State, Nigeria. The climate of the area is comparatively good, with a mean temperature of 30 ^{0}C during the hottest period of February to April and 21 ^{0}C during the coldest period of December to January. It has distinct dry and rainy seasons. The annual average rainfall is between 2500 – 3000 mm, distributed through March to November. Some of the crops grown include cassava, yam, maize, cocoyam, oil palm,

vegetables, tomatoes, pepper, and others. The zone was chosen because of the preponderance of palm oil producers. The agricultural zone comprises ten blocks, according to the State Agricultural Development Programme's (ADP) classification. Multistage and random sampling methods were used to select 100 respondents for the study. The first stage involved the random selection of five blocks out of the ten blocks in the agricultural zone. The selected blocks were Sapele, Udu, Ugheli-North, Ethiope-West, and Isoko-North. The second stage involved random selection of two circles each, from eight circles in a block, giving a total of ten circles. The last stage involved random selection of ten palm oil producers from the ten selected circles to arrive at a total sample size of 100.

Data for the study were collected using well structured and pre-tested questionnaire administered on the respondents, with the help of extension agents covering the selected circles. Data were collected on socio-economic characteristics of the producers, sources of fund and labour, output and inputs quantities and their current market prices and the problems militating against palm oil production in the area. Eight item statements were presented and respondents rated the problems on a three point likert-type scale of serious (3), moderately serious (2) and not serious (1) with a mid-point of 2.0. Items scoring a mean equal to or greater than 2.0 were considered as serious problems. Descriptive statistical methods such as frequency, percentage and mean were used to characterize the respondents in the study area and to determine the sources of fund and type of labour used. Multiple regression analysis was used to ascertain the influence of some socio-economic variables on net income of the producers. The seriousness of the problem militating against palm oil production was evaluated by mean ranking.

The multiple regression model was explicitly specified as:

$NPI = \beta_0 + \beta_1 Gen + \beta_2 AGE + \beta_3 EDU + \beta_4 HOS + \beta_5 YEP + \beta_6 COI + \beta_7 MFO + e_i$

Where:

NPI = Net production income (₦)

GEN = Gender (dummy: male = 1; female = 0)

AGE = Age of the producer (years)

EDU = Educational level (years)

HOS = Household size (number of persons living together)

YEP = Years of experience

COI = Cost of inputs (₦)

MFO = Membership of farmer's organization (dummy: member = 1; otherwise = 0)

$\beta_0 - \beta_7$ = parameters to be estimated

e_i = stochastic error term

Results and Discussions

Socio economic characteristics of the respondents

Gender distribution of palm oil producers as shown in Table 1 indicates that 74 % were female. This finding corroborates Ibekwe [7] who observed that women play a great role in palm oil production such as hewing of firewood, fetching water and boiling of palm fruits. Also Adisa and Okunade [8] noted that women are the backbone of the agricultural sector, accounting for 70% of farm labour and being responsible for 80 % of food production. 66 % of the respondents were between 50-60 years. This implies that the respondents in palm oil production in the area were aged people, hence had accumulated resources that would enable them try new innovations and also take rational decisions in respect of business management. This finding agrees with Agbelemoge [9] who observed that aged people were involved in maize/cassava production in Remo Area of Ogun State, Nigeria. Also Courtney [10] gave a similar expression that rural agribusiness is dominated by aged people, with an increasing lack of interest among young people across the globe in pursuing agricultural careers.

44% of the respondents were widows while 42 % were married. This agrees with Olaleye [11] who opined that widows get involved in the production of palm oil in order to keep their families afloat. Furthermore, the result implies that agriculture employs a high percentage of widows, especially in rural areas where agriculture is the major occupation for self reliance and generation of income [12]. 68 % of them were literate, which is an added advantage to accept new innovations. Education was observed to be important in creating positive mental attitude towards adoption of modern farming.

60% of the respondents had household size of 5-9 persons with a mean household size of 7 persons. This implies that the farmers had a fairly large household size which could probably serve as an insurance against shortfalls in supply of farm labour. Table 1 also shows 60 % of the respondents had farming experience of 11-15 years and an average of 13.2 years. This suggests that the farmers are knowledgeable in the technicalities and methods, managerial skills as well as adoption of improved technologies and decision making. Other studies had shown that at 13 years of farming experience, farmers had fairly long period of experience which could serve as an added advantage for increased production, having acquired enough wealth of knowledge. [14] 82% of the respondents had no access to credit while 18% had access to credit. This implies that majority of them were unable to access one of the most important production inputs, so could not exploit their full potentials for increased production of the commodity. 66% of the

respondents belonged to 3 - 4 farmers' organizations, which could offer more opportunities for participatory interaction with extension agents. Unnaya [15] noted that promotion of farmers' organizations and reinforcing capacities of the producers will enhance access to improved services. This has implication for extension organizations to encourage farmers to form groups to enable them gain better access to resources, including improved techniques of palm oil production for increased agricultural production and productivity. Entries in Table 1 further indicate that, even though 28 % of the respondents earned up to ₦75,000 per annum, which is the equivalent of $1.35 per day poverty benchmark [16] 63 % of the respondents earned ₦76,000 and above. This marks a great improvement on an earlier study [17] 53 - 70 % of women are living below the poverty line, earning less than $1.00 per day. This indicates that more than half of the respondents earned the minimum income to put them well above the poverty line.

Sources of fund for palm oil production

54% of respondents raised their initial capital from personal savings, 20% from friends, 18% from clubs/isusu, while only 8% sourced their fund from banks (Table II). This implies that the respondents had limited access to credits; hence the available capital constrained them to small scale production. Similar trend was also observed by Ogunleye *et. al* [18] that initial capital used was mostly from personal savings of the producers.

Type of labour used by the respondents

64% of the respondents used hired labour and family labour (30%), while communal labour accounted for only 6 % (Table III). Despite high cost of labour, producers still prefer hired labour, since it is the easiest and most available way of processing palm fruits. In an agrarian community, people go for hired labour as a source of income to supplement that of the household, more especially when the labour is high [19].

Influence of socio-economic variables on net production income

The multiple regression analysis was adopted to predict the influence of the respondent's socio-economic factors (independent variables) on net production income (dependent variable). The selected predictors were: gender represented by GEN, age (AGE), educational level (EDU), household size (HOS), years of experience (YEP), cost of inputs (COI) and membership of farm organization (MFO). Data were fitted to the model and tried in four functional forms of linear, exponential, semi-log and double-log. Output of the linear form was the best in terms of signs, magnitudes and number of significant parameter estimates (Table IV). Out of the seven study variables, two were positively signed (household size and years of experience) and statistically significant at 5% probability level. The coefficient

of household size was positive and statistically significant at 5% probability level. The implication is that more family labour will be readily available [20] which will be an obvious advantage in terms of farm labour supply. The coefficient of years of experience was also positive and significant. The implication of this is that the respondents who are more experienced in the business would have accumulated resources to enable them to adopt modern palm oil production techniques, become more efficient in production and hence, earn higher income. Adeoti [21] who reported that years of experience reduce farmer's inefficiency.

The estimated coefficient of gender, educational level and membership of farm organization were positively related with net production income, but not significant. This implies that an increase in any of the explanatory variables will increase the income of the respondents. The estimated coefficient of age and cost of inputs were negatively related with the income of the respondents. This is in line with the *a priori* expectation that palm oil production involves the use of energy as well as maximization of profit. Result of the multiple regression analysis (Table IV) reveals the coefficient of multiple determinants (R^2) to be 0.782. This implies 78% of the variations in net production income realized by the respondents were explained by the independent variables while the remaining 22% was due to error. The F-statistic value of 9.356 was significant and confirms the overall significance of the regression analysis. Also the Durbin-Watson value of 1.768 indicated the absence of autocorrelation among the factors considered.

Problems militating against palm oil production

As shown in Table V, production output was seriously affected due to lack of capital (mean score), 3.5), cost of labour (3.4) and high cost of palm fruits due to scarcity (3.2). A similar report of poor access to credit facilities was observed to have constrained the adoption of conservation technology and the development of small scale enterprises respectively. [22,23]. Daniel, Jesse and Yusuf [24] showed that high cost of labour and farm inputs hindered the full participation of farmers in cane sugar production in Mubi Region of Adamawa State, Nigeria. Other variables with considerable mean scores were high cost of firewood (2.4), lack of electricity (2.3) and high cost of transportation (2.1). The development of sustainable productivity of palm oil requires increased use of purchased inputs, as the availability of the product and supply to farmers on a sustainable basis and at reasonable prices would increase the use of the product.

Conclusion and Recommendation

Palm oil producers in Central Agricultural Zone of Delta State, Nigeria earned income a little above the poverty benchmark. Their annual income was significantly determined by household size and years of experience. Efforts to ameliorate the problems posed by lack of capital, high cost of

labour and high cost of palm fruits due to scarcity, such as the provision of soft loans will increase output, income, and enable the producers to meet the increasing demand for product.

Table I: Distribution of respondents according to socio-economic characteristics (n = 100)

Variables	Percentage	Mean
Gender		
Male	26	
Female	74	
Age		
30 – 39	6	
40 – 49	12	
50 – 59	66	
60 and above	16	53.0
Marital status		
Single	6	
Married	42	
Divorced	8	
Widowed	44	
Educational level		
No formal education	32	
Primary education	60	
Secondary education	8	
Household size		
1 – 4	18	
5 – 9	60	
10 – 14	22	7
Years of experience		
1 – 5	4	
6 – 10	12	
11 – 15	60	
16 – 20	22	
21 and above	2	13.2
Access to credit		
Yes	18	
No	82	
Membership of farmers' organization		
1 – 2	34	
3 – 4	66	3.0

Annual income (₦)		
51,000 – 75,000	28	
76,000 – 100,000	63	
101,000 - 125,000	8	
126,000 and above	1	83,380

Source: Field survey, 2011.

Table II: Distribution of respondents according to sources of fund (n = 100)

Sources of fund	Percentage
Personal savings	54
Loan from banks	8
Loan from friends and relatives	20
Loan from clubs/isusu	18

Source: Field survey, 2011.

Table III: Distribution of respondents according to type of labour (n = 100)

Labour	Percentage
Family labour	30
Communal labour	6
Hired labour	64

Source: Field survey, 2011.

Table IV: Estimated multiple regression parameters

Variable	Coefficient	T-value	Significant
Constant	9.478	0.710	0.523
GEN	0.769	0.478	0.251
AGE	-1.542	-0.168	0.423
EDU	2.791	0.507	0.312
HOS	0.029	0.205	0.001 *
YEP	0.361	0.207	0.002 *
COI	-1.903	0.647	0.371
MFO	0.556	0.438	0.233
R^2	= 0.782		
F–statistic	= 9.356		
Durbin-Watson statistic	= 1.768		

Source: Field survey, 2011. Note: * = Significant at 5% level.

Table V: Distribution of respondent according to production problems

Problem	Mean score	Rank
High cost of transportation	2.1	6th
High cost of firewood	2.4	4th
High cost of palm fruits due to scarcity	3.2	3rd
Lack of water	1.2	9th
Lack of capital	3.5	1st
High cost of labour	3.4	2nd
Debts owned by clients	1.6	8th
Unavailability of extension agents	1.8	7th
Lack of steady electricity	2.3	5th

Source: Field survey, 2011.

References

1. Adakaren, B. and Orewa, S. I. (2009). Socio-economic analysis of palm oil marketers in Edo State, Nigeria. *African Journal of Agricultural Research and Developmen,* 2(1) 1-4.
2. Fold, N. (2003). Oil palm: markets and trade. *BUROTROP Bulletin. No. 19.*
3. Amaechi, C. C. E., Mbanaso, A. J. and Ukoha, O. O. (2006) Determinants of profitability of small holder palm oil mill enterprise in Imo State, Nigeria. *Proceedings* of the 40th Annual Conference of the Agricultural Society of Nigeria (ASN), Abia, 2006. pp. 90-93.
4. United Nations Industrial Development Organization (UNIDO) (1992). Industrial Development *Review Series* for Nigeria, Malaysia, Thailand, Srilanka, China, Korea, Vietnam. (1975-1985).
5. Ukpabi, U. J. (2004). Sustainable post harvest technologies for major food crops. A *Paper* presented at the Workshop at Vietnam.
6. Nigerian Institute for Oil Palm Research (NIFOR) (1981). *NIFOR Highlight of Activities 1981.* NIFOR, Benin, Edo State, Nigeria.
7. Ibekwe, U. C. (2008). Role of women in palm fruit processing and marketing in Imo State, Nigeria. *The social science,* 3; 61-65.
8. Adisa, B. O. and Okunade, E. O. (2011). Women in agriculture and rural development. In: M.C. Madukwe (ed). *Agricultural Extension in Nigeria.* 2nd edition. Agricultural Extension Society of Nigeria (AESON), AESON Publication. C/o Agricultural and Rural Management Training Institute (ARMTI) Ilorin, Nigeria (pp. 90 – 100).
9. Agbelemoge, A. (2011). Comparative analysis of extension activities of governmental (OGADEP) and non-governmental (DADP) agencies on maize/cassava production in Remo Area of Ogun State, Nigeria. *Journal of Extension Systems,* 27; 22-29.
10. Courtney, Paisley (2011). Youth farming and research. *Farming Matters* (formerly LEISA Magazine), 27(1).
11. Olaleye, R. S. (2004). Analysis of rural women agro-processing activities in improved household food security in Ondo State, Nigeria. *Paper* presented at the 5th National conference of the NAAE, Department of Agricultural Economics and Rural Sociology, ABU, Zaria, Nigeria.
12. Kompmann, M. (1999). Sector programme and how it can contribute to poverty reduction and gender equity. *Agriculture and Rural Development,* 6(2) 8-9.
13. Benor, D., Harrison, J. Q. and Baxter, M. (1997). *Agricultural extension: The training and visit system.* Washington, D.C. The World Bank.
14. Onwubuya, E. A., OKporie, E. O. and Nenna, M. G. (2008). Nsukka yellow paper: Processing and preservation techniques among women farmers in Enugu State, Nigeria. *African Journal of Agricultural Research,* 4(9) 859 – 863.
15. Unnayan, O. (2010). Agrarian transition and livelihoods of the rural poor. *Agricultural Extension services.* The Innovator, Bangladesh. Retrieved from http://www.unnayan.org.
16. Ogunbameru, B. O., Okelue, O. A. and Idrisa, Y.L. (2010). Profile and challenges to women participation in agricultural co-operative in Maiduguri Metroplis, Borno State, Nigeria. *Journal of Agricultural Extension,* 14(1) 111-121.

17. Adebayo, O. O. and Amao, J. O. (2003). Rural women and poverty alleviation in Ogo-Oluwa, Oyo State, Nigeria. *African Journal of Business and Economic Research,* 1(2) 200-203

18. Ogunleye, K. Y., Thomas, K. and Oyebade, S. O. (2010). Marketing extension needs for sustainable extension practices among cassava farmers in Surulere Local Government Area of Oyo State, Nigeria. *Journal of Agricultural Extension,*. 14(1) 122-130.

19. Cleaver, K. M. (1993). A strategy to develop agriculture in sub-sahara Africa and a focus for the World Bank. *World Bank Technical Paper No. 203,* Washington, D.C.

20. Ozor, N. and Nnaji, C. (2010). Difficulties in adaptation to climate change by farmers in Enugu State, Nigeria. *Journal of Agricultural Extension,* 14(2) 107-123.

21. Adeoti, A. I. (2004). Impact of HIV/AIDS and related sickness on the technical efficiency of farms in Benue State, Nigeria. *Issues in African Rural Development Monograph series. No. 34.*

22. Ugwumba, C. O. A., Okoh, R. N. and Isitor, S. U. (2009). Microfinance for small-scale enterprises development in Anambra State, Nigeria: A gender analysis. *Nigerian Journal of Research and Production, 15(2)* 145-159.

23. Nenna, M. G. (2011). The role of extension in technology adoption among rice farmers in Ayamelum Local Government Area of Anambra State, Nigeria. *Journal of Extension Systems,* 27; 30-43.

24. Daniel, J. D., Jesse, Y. A. and Yusuf, A. (2009). Profitability of sugar cane production in Mubi Region of Adamawa State, Nigeria. *Journal of Research in Agriculture,* 6(1) 99-104.