

## FACTORS AFFECTING OIL PALM PRODUCTION IN ONDO STATE OF NIGERIA

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### ABSTRACT

*The discovery of crude oil and the civil war adversely affected oil palm production in Nigeria. This has resulted in scarcity and high cost of palm products and palm oil. The study therefore investigated the factors influencing oil palm production in Ondo State, Nigeria. One hundred and fifty respondents were selected from predominantly oil palm producing areas through purposive sampling technique. The findings of the study showed that 13.3% of the oil palm farmers complained of planting adulterated seedlings obtained from MANR/ADP/NIFOR nurseries. More than half (53.3%) transplanted seedlings less than ten months of age. Regression analysis showed that only two of the variables; level of education attained (0.043), number of times the respondents attended training (0.054) were predicted to have significant relationship with the yield of oil palm. In conclusion, more than half of the oil palm farmers (53.3%) transplanted seedlings less than ten months of age while some of the seedlings obtained were adulterated. This study recommends that farmers should be assisted to obtain seedlings that have been established very well in the nursery which are ten months and above. Efforts should be made to create awareness to farmers on the need to establish the seedlings very well before transplanting by agricultural extension agents.*

**Key words:** oil palm, scarcity, production and constraints.

### INTRODUCTION

The oil palm (*Elaeis guineensis*) is one of the important economic crops in the tropics (Anyanwu; Anyanwu and Anyanwu, 1982). It belongs to the family *palmae* (having 225 genera with over 2600 species), and the subfamily *cocoideae* of which it is the most important member (Opeke, 1987). The oil palm is a versatile tree crop with almost all parts of the tree being useful and of economic value. The principal product of oil palm is the palm fruit, which is processed to obtain three commercial products. These include palm oil, palm kernel oil and palm kernel cake. The uses of palm oil are many and varied (Adegbola; Are; Ashaye & Komolafe, 1979). Locally, it is used for cooking, soap making, metal plating and lamp oil. The palm kernel oil however, is used for soap making, as a source of glycerine, for manufacturing margarine, cooking fats and for making lubricants. The residue obtained after extraction of oil is called kernel cake, which is useful in livestock feed production. The midribs and rachis of oil palm are used for making brooms and roofing materials. The thicker leaf stalk is used for making the walls of village huts. The bark of the frond is peeled and woven into baskets while the trunk (main stem) can be split and used as supporting frames in buildings. A sap tapped from the male flower is drunk as palm wine, which is a source of yeast. The spent fruit

bunch and fibre that remains after oil extraction can be used for mulching, as manure and as fuel.

The development of the economic oil palm had continued to attract the attention of various administrations in Nigeria since the colonial period to date. This was not unconnected with its economic importance as a very important source of edible and technical oils of a huge National revenue earning potentials. Palm oil and palm kernel oil, the major products of oil palm, were once very vital to Nigeria's export trade as Nigeria was a leading producer of oil palm produce in the world. However, since 1965, there has been a noticeable decline in her oil palm production (Mgbeje, 2004). By 1966, other competing countries such as Malaysia and Indonesia became leading producers as their production surpassed Africa's total palm oil production ([www.fao.org](http://www.fao.org)). As Nigeria plans to reclaim its leading position as the world's largest producer of palm oil that it lost to Malaysia over three decades ago (Atser, 2007), the study, therefore, aims at identifying the factors affecting oil palm production in the study area.

The primary objective of the study is to determine the factors affecting oil palm production in predominantly oil palm producing areas of Ondo state of Nigeria. The specific objectives are to:

- i. determine the personal characteristics of the oil palm farmers in the study area.
- ii. determine the factors affecting oil palm production in the study area.
- iii. identify the number of sources of extension services available to oil palm farmers in the study area.
- iv. investigate if oil palm farmers in the study area are involved in any farmers' group activities.

## **RESEARCH METHODOLOGY**

The study area is in Ondo state of Nigeria. One hundred and fifty respondents were selected from predominantly oil palm producing areas through purposive sampling technique. The state was stratified into three subgroups or strata according to the three major ecological zones. Only the rainforest and the derived savannah zones were purposively selected for the study. This was because the mangrove swamp zone does not have substantial oil palm but raphia palm. It thus was purposively eliminated, leaving two ecological zones.

The purposive sampling technique was used to obtain data for the study through the use of structured questionnaires. For the forest zone, two predominant oil palm producing L.G.As were purposively picked out of the 11 L.G.As contained in the zone. The total number of villages in each of these L.G.As purposively picked was determined and 10% of these villages were purposively selected based on predominant production of oil palm which served as the sample size for the zone. Likewise, for the savanna zone, one predominant oil palm producing L.G.A was purposively picked out of the four L.G.As contained in the zone i.e. 10% of 4, which is 0.4 approximated to one. The total number of villages in this L.G.A was determined and 10% of these villages were purposively selected based on predominant production of oil palm in the zone.

The final step involved purposively sampling of oil palm farmers from the sample area. Fifty oil palm farmers were purposively selected from each of the three selected L.G.As making a total of 150 oil palm farmers selected purposively. Fifty questionnaires

were administered in each of the predominant oil palm producing L.G.As purposively selected making a total of one-hundred and fifty farmers that gave their responses.

The data collected was analyzed with the aid of Statistical Packages for Social Sciences (SPSS). Simple descriptive statistics such as frequency counts, means, standard deviation and percentages were used to analyze and summarize the data. Inferential statistics such as chi-square, Pearson correlation and T-test were used to determine the significance of the relationship among the selected variables compared and to test the differences between groups of variable. In addition, regression analysis was used to determine the significance of relationships of several factors perceived to affect yield of oil palm in the study.

## **RESULTS AND DISCUSSIONS**

**Table 1: Farmers' selected personal characteristics (n=150)**

<b>Variables</b>	<b>Frequencies</b>	<b>Percentage (%)</b>
<b>Sex</b>		
Male	114	76.0
Female	36	24.0
<b>Age range (years)</b>		
< 30	2	1.3
31-40	16	10.7
41-50	46	30.7
51-60	45	30.0
61-70	24	16.0
71 and above	17	11.3
<b>Marital status</b>		Mean=37 years
Single	4	
Married	136	2.7
Separated	4	90.7
Widowed	6	2.7
<b>Family size: No of children</b>		4.0
0-4	56	
5-9	70	37.3
10-14	14	46.7
15-19	7	9.3
20-24	3	4.7
		2.0
<b>Family size: No of dependents</b>		Mean= 8 Children
0-4	147	
5-9	2	98.0
10-14	1	1.3
		0.7
		Mean=2 dependents
<b>Farm size in Hectares</b>		
<10	115	77.0
10-20	30	20.0

>20	5	3.3
<b>Membership in farmers' cooperative(s)</b>		
Belong	39	26.0
Don't Belong	111	74.0
<b>Educational level attained</b>		
Non-formal	13	8.7
Adult literacy	24	16.0
Primary education	39	26.0
Secondary	30	20.0
Tertiary	44	29.0
<b>No of times attended training</b>		
1-3	33	22.0
4 and above	11	7.3
No training	106	70.7

Source: Field Survey, 2007

Table 1 above shows the selected personal characteristics of oil palm farmers considered in the study. Gender is an important issue in agricultural production because of role division between men and women. The result shows that majority of the farmers (76.0%) are males. This could be attributed to drudgery nature and physical energy demand, and large financial investment needed for plantation establishment which discouraged women. Age, another important issue that determines or affects the level of production and productivity of farmers. Although, experience in farming is very important and it depends on years of practice, yet averagely young farmers are needed on farms because agricultural production is energy demanding especially oil palm production. From the results above, most of the oil palm farmers (60.7%) are of the ages between 41-60 years, which are fairly agile and active with a mean age of 37 years. The age distribution among farmers in this study tends to agree with Ekong (2003) and Solomon (1994) which confirmed that Nigerian farmers are within the age bracket of 40-60 years. Marital status indicates whether a respondent is married or single. Result from table 1 shows that majority of the farmers (90.7%) are married. Married men are expected to have more labour force compared to singles depending on their family labour as immediate source of their labour. Adegeye (1993) confirmed that family labour is very important in the maintenance and establishment of cash crop farms. Households refer to all persons occupying the same house. These include relatives as well as lodgers. In table 1 above, result shows majority of the respondents (98.0%) having dependents within the range of 0-4; 2% have above four dependents with a mean number of two dependents. This high proportion of respondents with few dependents might be because of the slightly high living conditions.

The result on farm size (table 1) shows that majority of the oil palm farmers (77.0%) cultivated less than 10ha of oil palm plantations. The relevance of farm size in this study stems from the studies of Williams; Fenley; and Williams, (1984) that large farm size in terms of hectares, and labour is significantly related to farmer's utilization of improved farm practices applicable to their farm enterprise. This, in turn, is expected to bring about increase in yield. Result from table 1 also shows that most respondents

(74.0%) do not belong to any cooperative(s) while only 26.0% do. Non-membership in farmers' cooperatives probably may have affected oil palm production negatively since oil palm farmers that do not belong to any cooperative(s) are likely to have less knowledge on oil palm production while those who have membership are likely to adopt innovation faster as they will have opportunity to mix with other adopters which may enhance exchange of ideas, attitudes, skills and knowledge among others. The level of farmers' education is crucial to their understanding the value and use of oil palm innovations. The believe is that high literacy level aids transfer of improved farm practices related to the production of oil palm. Among the farmers interviewed, result from table 1 shows that majority (75.0%) completed one form of formal education or the other- primary, secondary and higher educations meaning they generally have a relatively high level of education. It also creates awareness and need to seek useful sources of information on farm technologies. Table 1 shows that 22% of the respondents that had training fell within the range of (1-3) times, 7.3% had four times and above. The importance of the frequency of training attended is probably that the oil palm farmers become familiar with the improved technical practices needed in the cultivation of oil palm.

**Table 2: Sources of information on Extension Services**

Sources of extension Services	Always		Occasionally		Never	
	Fe	%	Fe	%	Fe	%
Research stations e.g. NIFOR	7	4.7	69	46.0	74	49.3
Radio	16	10.7	98	65.3	36	24.0
TV	12	8.0	84	56.0	54	36.0
ADP	39	26.0	71	47.3	40	26.7
Contacts with neighbours	16	10.7	47	31.3	87	58.0
Contacts with relatives	11	7.3	32	21.3	107	71.3
Contact with Cooperatives	10	6.7	37	24.7	103	68.7

Source: Field Survey, 2007

In this study, the result shows (Table 2) that 26.0% indicated that they always have information on extension services from Agricultural Development Programmes (ADPs). Similarly, 10.7% always obtain information on extension services from radio and neighbours, while 8.0%, 7.3%, 6.7% and 4.7% always obtain information from Television (T.V), relatives, cooperatives, and Research Institutes such as NIFOR respectively. These available sources of information are expected to be sufficient for acquiring information necessary for oil palm production if they are reliably adequate. The results implied that ADPs, radio and neighbours are the main sources of information for extension services to oil palm farmers.

**Table 3: Problems encountered from Seedlings obtained from MANR/NIFOR**

Problems encountered	Frequency	Percentage (%)
Financial constraints	24	16.0
Transportation of seedlings	35	23.3
Death of seedlings	26	17.3
Adulterated /bad seedlings	20	13.3
Labour	13	8.7
Don't know because labour are hired	2	1.3
Animals and Rodents	6	4.0
No problem	32	21.3
Total (Multiple responses)	158	

Source: Field Survey, 2007

The results showed (Table 3) constraints encountered from seedlings obtained from MANR/ADP/NIFOR nurseries. Transportation of seedlings was the major problem encountered as 23.3% of the oil palm farmers were confronted with this problem, 16.0% had financial constraints, 17.3% claimed they recorded death of seedlings while 13.3% complained of adulterated/bad seedlings. Oil palm farmers indicating the problem of labour were 8.7%, 4.0% pointed out animals and rodents attack while 21.3% said they experienced no problem. The implication of the transportation problem may be that plantations are too distant from the nursery or point of oil palm seedling collection and the cost of transporting the seedlings too high. Pot sizes of seedlings, poor net work of roads to estates/plantations that make evacuation of products both difficult and expensive may also explain the problem of transportation. Shortage of skilled labour, with high cost of existing labour and limited expertise has hindered the growth of this sub-sector in particular and the oil seeds sector in general with resultant high cost of production. Upon discussion with some of the respondents, they complained that staff of NIFOR often engaged in some shady deals by selling to them seedlings later discovered to be adulterated or bad, but pretending them to be seedlings produced by NIFOR. These acts are restrictive to productivity and resultant low yield in production.

**Table 4: Age at which seedlings were transplanted**

Age of seedlings (months)	Frequency	Percentage (%)
< 5	21	14.0
6-9	59	39.3
> 10	43	28.7
Not involved in this option	27	18.0
Total	150	100.0

Source: Field Survey, 2007

The results showed (Table 4) that 39.3% of the oil palm farmers transplanted seedlings within the range of 6-9 months, 28.7% from ten months and above, while 14% claimed that they transplanted seedlings when they were only five months old and below depending on the vigour of the seedlings. Few respondents (18.0%) claimed they rented the oil palm field or plantation; hence, they were not involved in transplanting seedlings. According to early experiments conducted in Malaysia, between 12 and 18 months old

seedlings (from the two-leaf stage) come into bearing earlier and give appreciably higher yields than palms transplanted at six months old (Gray and Hew Choy Kean, 1963-6).

The implication for respondents that transplanted seedlings from ten months and above may be that the oil palm may come into bearing earlier giving yield at its optimal potentials, while those transplanted less than 10 months old may be getting yield below the optimal potentials of oil palms on their plantations. Based on these results, it may be concluded that respondents that recorded higher yield may be those that transplanted seedlings from ten months and above while lower yield recorded may be attributed to those that transplanted oil palm seedlings less than 10 months old.

**Table 5: Multiple Regression analysis of factors affecting oil palm production in Ondo state of Nigeria**

<b>Variables</b>	<b>Coefficients</b>
Constant	(1.690)
<b>Selected personal characteristics</b>	
Sex (X <sub>1</sub> )	-0.173 (-1.029)
Age (X <sub>2</sub> )	-0.010 (-0.055)
Marital status (X <sub>3</sub> )	0.443 (1.622)
Household size (X <sub>4</sub> )	-0.205 (-0.985)
Farm Size (X <sub>5</sub> )	-0.057 (-0.242)
Farming Experiences (X <sub>6</sub> )	0.186 (0.697)
Education level attained (X <sub>7</sub> )	-0.388(-2.130)**
Membership of farmer Coop (X <sub>8</sub> )	-0.284 (-0.905)
No of times attended training(X <sub>9</sub> )	-0.348 (-2.024)**
<b>Sources of Information on Extension Services</b>	
Contact with Research stations (X <sub>10</sub> )	-0.071 (-0.301)
Radio (X <sub>11</sub> )	-0.134 (-0.404)
TV (X <sub>12</sub> )	0.089 (0.287)
Contact with ADP (X <sub>13</sub> )	0.188 (0.770)
Contact with Neighbours (X <sub>14</sub> )	0.251 (0.947)
Contact with Relatives (X <sub>15</sub> )	-0.142 (-0.366)
R-square	0.506
Adjusted R-square	0.189

Source: Field Survey 2007

\*\* Statistically significant 5% level

T- Ratios are in parenthesis.

N = 150

R = the degree at which the relationship between the dependent variable and a combination of the independent variables can be predicted.

$R^2$  = the coefficient of determination/variation. This is the amount of variation in the dependent variable that can be explained by the independent variables.

This section shows the result of multiple regression analysis determining the significance of relationships of several factors perceived to affect yield of oil palm in the study. The perceived factors (independent variables) are selected personal characteristics, training, and membership of farmers' association and sources of information on extension services available to oil palm farmers.

In table 5,  $R^2$  (0.506) indicates that the independent variables can explain 50.6% of the variations in the dependent variable. In regression analysis, when you have up to 40% of your  $R^2$ , it is regarded as been accepted. Therefore, this multiple regression analysis is regarded as been accepted with 50.6% of the  $R^2$ , since it is up to 40%. The results of the regression analysis indicate that marital status ( $X_3$ ), contact with neighbours ( $X_{14}$ ) and contact with ADP ( $X_{13}$ ) have very high positive contribution to the yield of oil palm (Table 5). Educational level attained ( $X_7$ ), number of times attended training ( $X_9$ ) and membership of farmers' Association/Cooperation ( $X_8$ ) indicates very high negative contribution. It is also indicated that only Educational level attained (0.043) and number of times attended training (0.054) were significant at 0.05 probability level. This showed that only the two variables were predicted to have significant relationship with the yield of oil palm. The implication of this result is that those variables that have positive contribution to bringing high yield should be encouraged or enhanced while try minimize those that give high negative contribution to yield of oil palm. The conclusion to these results is that high educational attainment ( $X_7$ ) and exposure to training ( $X_9$ ) have enhanced better understanding of the value and use of improved practices or innovations in oil palm production.

## **CONCLUSION**

In conclusion, Oil palm farmers in the study area are reluctant to use the improved hybrid planting materials from MANR/ADP/NIFOR nurseries. This is because they claimed that staff of these organizations sell to them adulterated/bad seedlings produced privately pretending them to be genuine improved hybrid seedlings. Majority of Oil palm farmers in the study area transplant their seedlings less than 10 months of age in the nursery. It has been scientifically proved that seedlings transplanted when they are well above 10 months of age in the nursery get to early fruiting stage with yields at the optimal potentials of the oil palm. It was also observed that verbal interview with some of the oil palm farmers showed they complain seriously of irregular measuring container to sell palm oil to buyers

## **RECOMMENDATIONS**

Based on the findings of the study, the following recommendations are suggested.

- Efforts should be intensified to educate the farmers on the benefits of ensuring that seedlings should be allowed to establish very well in the nursery before transplanting permanently to the field. This should be encouraged when they are of the age 10 months and above.



- The alleged unbecoming activities of staff working where improved hybrid seedlings are produced should be investigated and nipped to curtail future occurrences.
- Extension workers should intensify efforts to educate the farmers on improved oil palm production management practices.
- Farmers should be encouraged to form co-operative societies to solve the tripartite problems of inadequate information and cultivation knowledge about oil palm production, lack of funds, and lack of land, by pooling their resources together. These group(s) could also be used as targets, mediums and agents of change.
- The Nigerian Government should take a cue from what the Government of Malaysia and Indonesia are doing to encourage oil palm production in their countries.

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