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Revenue from oil palm seedlings production in Edo State, Nigeria

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ABSTRACT

Oil palm seedling production can serve as a means of providing gainful employment for the youth in order to combat poverty especially in the face of the current recession in Nigeria. This study carried out a profitability analysis of oil palm seedlings production in Edo State, Nigeria. The specific objectives were to examine the socio-economic characteristics of the oil palm seedlings producers, estimate the costs and returns in oil palm seedlings production, identify the factors affecting the level of income generated by producers and the likely problems of oil palm seedlings production. Primary data used in the study were collected through structured questionnaire administered to 90 randomly selected oil palm seedlings producers in the study area. Descriptive statistics, budgetary and multiple regression analyses were used in analysing the data. Results of the data analysis showed that majority (75.5%) of the respondents were males and were in their most active years and married (83.3%). The household size on the average was 7 persons. The selling price per oil palm seedling was ₦357.22 ($1.02) with a gross margin of ₦156.71 ($0.45) and net profit of ₦106.02 ($0.30) per seedling. The result of the multiple regression analysis showed that cost of planting materials and depreciation cost were significant determinants of income derived by producers of oil palm seeding at 1% and 5% levels respectively. The major constraints faced by the producers were inadequate finance, drudgery of operation as well as high cost of transportation. It was then recommended that producers of oil palm seedlings should invest more in their production in order to meet the increasing demand in the market and to generate more profit.

Key words: Edo State, oil palm, profitability, seedling production

INTRODUCTION

The study of economic history provides us with ample evidence that an agricultural sector has the potential to be the industrial and economic springboard from which a country's development can take off. Indeed, more often than not, agricultural activities are usually concentrated in the less developed rural areas where there is a critical need for rural transformation, redistribution, poverty alleviation and socio economic growth and development (Stewart, 2000).

The cultivated oil palm (*Elaeis guineensis)* is believed to have originated in the humid

lowland tropics of Africa. The oil palm is one of the world's main sources of edible oil and yields more oil per year than any other oil bearing plant. It is difficult to make accurate assessment of the world production of oil palm products owing to the quantities of produce that are not recorded, because they are produced in groves, small holder plots and farms and used for the farmers' domestic purposes or sold locally especially in Nigeria (Hartley, 1988; Ekunwe *et. al.,* 2009).

Moreover, the development of oil palm subsector has been slow in Nigeria. This is because contrary to the situation in Malaysia and Indonesia, whose production is based on large-scale monoculture, in Nigeria, 80 percent of production comes from dispersed small-scale holders who harvest semi-wild plants and use manual processing techniques (WRM, 2001). The oil palm seedling has a main advantage over other oil crops in that it is a perennial plant, and thus, in contrast to annual crops gives complete ground coverage and efficient light interception through the year (Osakwe 2001).

Several studies have shown that oil palm production is a profitable and viable enterprise in Nigeria (Ohimain, *et al.,* 2014; Ekunw*e et al.,* 2009; Alufohai and Ahmadu 2012). However, very few studies have been documented on the revenue derived from oil palm seedling production or the profitability of oil palm seedling production. This study sought to fill that gap and provide relevant information to policy makers, stakeholders and oil palm farmers on the revenue derived from oil palm seedling production in the study area.

The specific objectives of the study were to describe the socio-economic characteristics of oil palm seedlings production, estimate the costs and returns in oil palm seedling production, determine the factors affecting the level of revenue generated in the production of oil palm seedlings and identify constraints militating against oil palm seedling production in the study area.

MATERIALS AND METHODS

The study was conducted in Edo State of Nigeria. Edo State is made up of 18 Local Government Areas (LGAs). For this study three LGAs which are, Oredo, Ikpoba-Okha and Egor constituted the study area. The choice of the study area was based on the fact that it is one of the major oil palm producing areas in the State. Edo State is bounded in the north by Kogi State, in the west by Ondo State, in the south by Delta State, and in the east by part of Kogi and Delta States. It has a geographical coordinate of latitude 5^0 44^1 North and $7^0 34^1$ North of the Equator and longitude 5^0 4^1 East and $6^0 45^1$ East of the Greenwich Meridian. The State is classified as a rainforest Zone. The rainy season starts from April till about the end of October. The annual rainfall is between 1750mm and 2100mm with an average rainfall of 1920mm. The temperature is between 22°C and 30°C with an average annual relative humidity of 82% which is very suitable for oil palm production (Edo State Statistical Year Book, 2013). Edo State is divided into eighteen local government areas and as at the 2006 census, a population of about 3, 218,332million people lives in Edo State. Agriculture is the major occupation of the people which include arable and tree crop production, fishing, snail production, poultry and livestock rearing (Edo State Statistical Year Book, 2013).

A multi stage sampling technique was adopted in the selection of the respondents for this study. The first stage involved the purposive selection of three LGAs namely Oredo, Ikoba-Okha and Egor from the study area. In the second stage three villages in

each of the local government area were randomly selected and finally 10 oil palm seedlings producers from each village were randomly selected. A total of 90 oil palm seedlings producers were selected from the list of 150 producers of oil palm seedlings as provided by Nigerian Institute for Oil Palm Research (NIFOR) and ADP in the area of study. The primary data were collected through the use of structured questionnaire. The questionnaire was designed with questions covering the information required for the study. The data obtained were analysed using descriptive statistics such as frequency counts, means and percentages. Also, budgetary and multiple regression analyses were used. While, Likert scale was used to measure the constraints. Gross margin (GM) was calculated using the following formula:

GM=TR-TVC (1)

Where GM=Gross margin
TR=Total Revenue
TVC= Total variable cost.

Also,

Net Profit = GM-TFC (2)

Where TFC = Total fixed cost

R/N =NFI/TC (3)

Where: R/N = Return per naira
NFI = Net Farm Income
TC = Total Cost

The multiple regression analysis was used to determine the revenue derived from oil palm seedling producers. Three functional forms were subjected to the data analysis, the semi log, double log and linear forms. The linear multiple regression equation was implicitly stated as

$Y = (X_1, X_2, X_3, X_4\ X_5, \epsilon)$ (4)

Where:
Y =Revenue from oil palm seedling (₦)
X_1= Cost of planting materials (₦)
X_2=Cost of organic manure (₦)
X_3=Cost of fertilizer (₦)
X_4= Cost of labour (₦)
X_5= Depreciation cost (₦)
While the explicit form is

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \epsilon$ (5)

Where β_0 = intercept
$\beta_1\ to\ \beta_5$ are parameters to be estimated.

A four (4) point Likert type of scale method was used to determine the constraints faced by oil palm seedling producers and their level of seriousness. The responses to the various constraints were scored in the following way: 4 = very serious (VS), 3 = serious (S), 2 = moderately serious (AS) and 1 = not serious (NS). The mean value of 2.5 was used to measure the severity of the constraints. Any constraint from 2.5 mean score and above was considered a major constraint faced by the oil palm seedling producers.

RESULTS

Socioeconomic Characteristics of Oil Palm Seedlings Producers

The results of the socioeconomic characteristics of the respondents are presented in Table 1. The result of the distribution of oil palm seedlings producers based on sex as presented showed that 75.6% of oil palm seedling producers were male while only 24.4% were female. The ages of the respondents were between 20 and above 60 years, with a mean of 43 years. The highest percentages of the respondents fell within the age range of 31-40 years as indicated by 40%. The results also showed that 83.3% of the oil palm seedling producers were married and 5.5% were single, 4.4% were divorced and also 6.6% were widowed. The family size of the respondents was between 1 and 12 persons. Majority (43.3%) of the respondents fell within the range of 1- 4 persons, while about 25.5% had family size ranging from 9 -12 persons. Table 1 also shows the educational attainment of oil palm seedling producers in the study area. According to the result, majority (90%) of the respondents had at least some level of education, while only 10% had no formal education. The production experience of oil palm seedlings producers in the study area was also presented in Table 1. About 45.5% had production experience between 6-10 years, while 4.5% had 16-20 years of production experience, while the average production experience was 11 years. Table 1 also shows that 78.9% source of oil palm sprouted seeds were from Nigerian Institute for Oil Palm Research (NIFOR), while 21.1% of the sprouted seeds were from ADP.

Profitability Analysis per Seedling Produce

The result of the profitability analysis is presented in Table 2. The result shows that the revenue derived per seedling per annum was ₦357.22, with a gross margin per annum per seedling of ₦134.71 and a net profit of ₦106.02. The total variable cost per seedling per annum was ₦222.51, while the depreciation cost was ₦50.69.

Determinants of Revenue Derived from Oil Palm Seedlings Production

The results of the multiple regression analysis are presented in Table 3. Multiple regression analysis was used to determine the factors that had effect on the revenue derived by the respondents. The linear production function was selected as the lead equation because it had highest coefficient of multiple determination (R^2), numbers of significant variables and higher F-value.

Production Constraints

The major constraints faced by the respondents are shown in Table 4. These include financial constraint (mean = 3.98), drudgery of operation (mean = 3.24). The drudgery causes ill health (mean = 3.12) and time consuming (mean = 3.16) which are above 2.5.

Table 1: Socioeconomic Characteristics of Oil Palm Seedlings Producers

Items	Frequency	Percentages	Mean
Sex:			
Male	68	75.6	
Female	22	24.4	
Total	90	100	
Age:			
20-30 years	3	30	
31-40 years	36	40	
41-50 years	22	24.5	
51-60 years	20	22.0	
Above 60	9	10	43 years
Total	90	100	
Marital Status:			
Single	5	5.5	
Married	75	83.3	
Divorced	4	4.4	
Widowed	6	6.6	
Total	90	100	
Family Size:			
1-4 persons	39	43.5	
5-8 persons	28	31	7 persons
9-12 persons	23	25.5	
Total	90	100	
Educational level			
No formal education	9	10	
Primary	10	11	
Secondary	41	45.5	
Tertiary	30	33.5	
Total	90	100	
Production experience:			
1-5 years	25	27.5	
6-10 years	41	45.5	11 years
11-15 years	20	22.5	
Above 15 years	4	4.5	
Total	90	100	
Source of Sprouted Seeds (Tenera)			
NIFOR	71	78.9	
ADP	19	21.1	
Total	90	100	

Source: Computed from Field Survey Data, 2015

Table 2: Costs and Return per oil Palm Seedling per annum.

Input	Mean Value (₦)
Total Revenue	357.22
Variable Cost:	
Cost of planting material	97.57
Organic Manure Cost	20.92
Fertilizer Cost	24.07
Labour Cost	45.74
Transport Cost	12.21
Polythene bag	1.5
Land rent	20.5
Total Variable Cost (TVC)	222.51
Fixed Cost:	
Hoe (depreciation)	10.0
Cutlass (depreciation)	9.0
Shovel (depreciation)	9.69
Total Fixed cost	28.69
Total Cost (TC)	251.20
Gross Margin	134.71
Net Profit (NP)	106.02
Returns/Naira Invested NP/TC	0.42

Source: Field Survey, 2015.

Table 3: Multiple Regression Analysis

Items	Beta	Standard Error	t-ratio
Constant	1903.390***	584.061	3.259
Cost of Planting Material	0.214***	0.062	3.452
Cost of Organic Manure	1.398	1.958	0.714
Cost of Fertilizer	-2.968	2.867	-1.035
Cost of labour	-0.678**	0.341	-1.988
Depreciation Cost	-9.6711***	1.867	-5.180
F-Value 3.874**			
R^2 0.876			

*** = 1% and ** = 5% levels of Significant.

Source: Field Survey Data, 2015

Table 4: Production Constraints faced by Oil Palm Seedling Procedures

Constraints	Mean value	Ranking
Inadequate Finance	3.98	1st
Drudgery of operation	3.24	2nd
Time consuming	3.16	3rd
Drudgery causes ill health	3.12	4th
High cost of transportation	2.40	5th
Incidence of diseases and pests	1.82	6th
Irregular supply of seedlings/sprouted seeds	1.60	7th
No ready Market for seedlings	1.34	8th

Source: Field Survey Data, 2015.

DISCUSSION

The result of gender of the respondents implies that majority of the producers were men. This could be attributed to the fact that production of oil palm seedlings is tedious in nature and physical energy is demanded and large financial investment needed for plantation establishment which discourages women.

Agricultural production is energy demanding especially oil palm seedlings production. With more respondents falling within the range of 31-40 years and with a mean of 43 years shows they are fairly agile and active. The age distribution among farmers in the study area tends to agree with Ekong (2003) and Onoh and Peter-Onoh (2012) who reported that Nigerian farmers are within the age bracket of 40-60years.

The result of the marital status implies that majority of oil palm seedlings producers were married. Married men are expected to have more labour compared to singles. Married people depend on their family labour as their immediate source of labour. Adegeye (1993) confirmed that family labour is very important in the maintenance and establishment of farm enterprises.

The family size includes relatives as well as dependents. The high proportion of respondents with few dependents might be because of the slightly high living condition (Ibitoye, Akinsorotan, Meludu & Ibitoye 2011). The implication is that oil palm producers may have to spend more on hired labour. The result on educational level implies that the producers of oil palm seedlings in the study area were fairly educated and will be more willing to adopt new innovation.

The result on the respondents experience implies that there are much more experienced producers in oil palm seedlings production and hence the greater tendency to be technically efficient. Onyenweaku and Nwosu (2005) reported that the experience of farmers is known to contribute positively to efficiency in any business organization. The result also shows that majority of the producer get their oil palm sprouted seeds from NIFOR. The net profit when compared to the total production costs per seedling yielded a return per naira of 0.42 for every N1.00 invested.

The F-value (3.874) was significant at 5% level. This means that the line function is suitable for further analysis. The R^2 (0.876) indicates that 87.6% of the variation in the income of the respondents was explained by the variables in the regression model. However, only 2 variables were significant. These are cost of planting materials ($p<0.01$) and depreciated cost ($p<0.05$). The positive sign of the coefficient for planting materials implies that they have positive effect on income. Thus, a one unit increase in the cost of planting material per seedling would increase revenue by 0.214 naira. The implication is that the respondents invest more money in buying planting materials thereby increase revenue from the seedling production. However, the reverse is the case with capital cost (depreciation cost), as a one unit increase of cost of capital (depreciation value) would decrease revenue per seedling by -9.6711 naira from their production activities. The cost of labour was also significant at 5% level. This implies that a one unit increase in the cost of labour would decrease revenue per seedling by 0.678 naira holding all other variable constant.

The result on constraints faced by the respondents showed that inadequate finance ranked first as the major constraint faced by oil palm seedlings producers with a mean of 3.98 and the least ranked were irregular

supply of seedling or sprouted seeds and no ready market for seedlings.

CONCLUSION

The results of this study show that oil palm seedling production is profitable and a viable business venture. However, there are several constraints such as inadequate finance that militates against production of oil palm seedlings in the study area. Increase in the production level oil palm seedlings will generate more revenue in the future for producers and relevant stakeholders. Oil palm seedling producers should form cooperatives so as to solve the problems associated with inadequate finance and other major constraints they encounter.

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