

INFLUENCE OF LABOUR USE ON OIL PALM PRODUCTION IN OKITIPUPA LOCAL GOVERNMENT AREA OF ONDO STATE, NIGERIA

Odefadehan, O. O.

Department of Agricultural Extension and Communication Technology, Federal University of Technology, Akure,

Ondo State, Nigeria

Correspondence contact details: olalekanodefadehan@gmail.com

ABSTRACT

The study assessed labour influence on oil palm production in Okitipupa Local Government Area of Ondo state. Specifically it examined the socio-economic characteristics of farmers, determined the man-hour labour used for production activities in oil palm and palm oil production, determined the influence of labour usage on oil palm production in the study Area. The study also determined other factors that influenced the output of oil palm among 120 farmers who were randomly selected from five towns in the study area. Data was collected with structured questionnaire. Multiple regression was applied to determine the influence of labour usage on oil palm and palm oil production. Three functional forms of regression models were used namely: Linear, semi-log and Cobb Douglas functions. The majority of the respondents were in the range of 41-50 years. The mean age was 37 years and 71.7% of them were male. About 18% of the respondents used family labour in carrying out farm activities, 78.3% used hired and family labour, while 3.4 % made use of hired labour only on the farm. The average man-hour family labour used is 1703 and 8364 man-hour of hired labour was used. Out of the three functional forms; Cobb Douglas functional form was selected as the lead equation, with R^2 of 0.44. Labour usage had a coefficient of 0.055 and was statistically significant. Level of experience had a negative coefficient of -0.123 while educational level had a coefficient of 0.07. This shows increase in labour by a unit will increase output by 5.5%. It was recommended that credit facilities should be made available to the farmers to enable them pay for hired labour since it outweighs family labour usage.

Keywords: Labour- supply, oil palm production, farmers, and income

INTRODUCTION

Agriculture in the context of the nation's economy is tied to various sectors and is essential for generating broad-based growth necessary for development. Agriculture is fundamental for the sustenance of life and is also the bed rock of economic development. It functions in the provision of adequate and nutritious food for human development and raw materials for industries. In spite of the great roles played by agriculture in the economy of any nation, it cannot play these roles if there is absence or inadequate supply of labour. The supply of labour is very crucial in Nigerian agriculture where farmers are largely dependent on the use of local farm implements which are energy sapping. These crude implements not only frustrate farmers but create unnecessary expenses and slow down the farming processes (Abutu, 2014).

The production of oil palm and palm oil can only succeed when there is timely and adequate supply of labour in the production line. It is an enterprise that requires high level of labour because of its many production stages and several by-products which can be further processed into different final products. The situation is more worrisome with smallholder farmers who lack adequate capital to finance their farm operations and this has inhibited them from realizing optimum income. Labour supply has been identified as one of the most important input in oil palm and palm oil production in Nigeria. The wages of hired labour make up the largest single item of

expenditure on most farms. The cost of using hired labour is high and so as the production and yield (Bello, Bello, Essien and Saidu (2015)

The supply of labour in the oil palm enterprise has been faced with many challenges which has either increased the cost of production or made the production process difficult and delayed beyond the expected turnaround time. This labour issue cuts across all other food and tree crops in Nigeria. According to Odeleye (2015) "Of all the production inputs in a rain fed farming economy, human labour is now becoming crucial and limiting". In Nigeria, farm labour supply especially for planting, weeding and harvesting still constitutes serious bottlenecks. The crucial importance of labour in oil palm and palm oil production is not limited to smallholder farmers alone but also affects commercial farms. The output of oil palm is affected by several factors which is imperative to research. In view of this, it is necessary to conduct research and ascertain the socio-economic characteristics of the farmers, determine the factors that influence the output of oil palm, determine the man-hour labour requirement for production in oil palm and palm oil production activities and determine the influence of labour usage on oil palm and palm oil production in the study area.

METHODOLOGY

The study was carried out in Okitipupa Local Government Area of Ondo state, Nigeria. Okitipupa Local Government Area (LGA) is one of



the 18 LGAs in Ondo State. It lies between 50° 45" and 80° 15" North of the Equator and 4°35" and 4°50" E longitude within the tropical rainforest zone of Nigeria. The rainforest is highly favourable to oil palm production because of the heavy amount of rainfall available for greater parts of the year. It covers a total land area of 636 sq. km and has an estimated population of 233,565 people. An isohyperthermic soil temperature regime prevails in the area with total annual rainfall often exceeding 2000 mm, while the soil temperature has a narrow range of 27 to 28°C (Esu, Akpan-Idiok, Otigbo, Aki, and Ofem 2014). It is bounded in the East by Irele local government while to its west lies part of Odigbo Local Government and the Atlantic Ocean. To its North lies Odigbo Local Government while it is bounded in the South by Ilaje Local Government. The inhabitants of the local government area are mainly Yoruba of Ikale ethnic group and Yoruba language is widely spoken. The area is mainly agrarian in nature; with the cultivation of cash and food crops.

Okitipupa LGA was purposively selected from the 18 LGA in the state because of the high prevalence of oil palm farms in the area. From the list of the rural communities in Okitipupa local government area, five communities were randomly chosen. The selected communities are; Ilutitun-Oshoro, Ikoya, Iju-odo, Ayeka and Okitipupa. Twenty four farmers were selected systematically from the list of oil palm farmers in each of the five communities to give a sample size of 120 farmers.

Primary data were used in the study; the primary data were obtained through the use of well-structured questionnaire administered to the respondents. The analytical tools used in this study were descriptive statistics and multiple regression analysis. The descriptive statistics used were frequency distribution, percentages and mean. The multiple regression technique was applied using three functional forms namely; linear, semi-log and Cobb- Douglas. The best of fit was selected after considering the levels of estimated error, magnitude of R², number and signs of estimated regression coefficients. The functional forms are stated as follows;

I. Linear function

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + U$$

II. Double Log Function

$$\ln Y = a + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + b_4 \ln X_4 + b_5 \ln X_5 + U$$

III. Semi Log Function

$$Y = a + b_1 \log X_1 + b_2 \log X_2 + b_3 \log X_3 + b_4 \log X_4 + b_5 \log X_5 + U$$

Where

Y= Level of output per year

X₁= Annual labour Usage (in man-hour)

X₂= Level of Experience

X₃= Education level

X₄= Age

X₅= Farm Size

U= Error term

Measurement of variables

Output: Measured in tonnes of palm fruit and the exact tonnage was plugged into the equation

Labour Usage: Measured in man-hour and plugged the value was plugged into the equation directly

Experience: Measured in exact years the farmers has been involved in oil palm farming

Educational level: Measured in number of years spent to acquire the highest educational level assuming no class was repeated

Age: Measured in the exact chronological age of the farmers.

Farm Size: Measured in hectares

RESULTS AND DISCUSSION

Socioeconomic characteristics

Age - Table 1 show that 41.7% of the respondents were between the ages of 41 and 50 years which represents the highest proportion of the respondents. This is followed by the respondents in the age category of 31-40 years which accounted for 28.4 % of the farmers. This contradicts the finding of Alfred, Odefadehan and Adeyo (2014) where the farmers in the age range of 31-40 years were only 4.4 %. This is closely followed by respondents in the age category of 21-30 years which accounted for 26.7 %. The age category of 51-60 and 61 and above both had 1.7% respondents each. The average age of the farmers was 37 years. This average age indicates that these farmers are in the productive age stage.

Table 1: Age distribution of respondents

Years	Frequencies	Percentages
21-30	32	26.7
31-40	34	28.4
41-50	50	41.7
51-60	2	1.7
61 and above	2	1.7
Total	120	100 Mean= 37

Source: Field Survey, 2016

Gender - Table 2 shows that 71.7% of the respondents were male and 28.3% of them were females. It shows that majority of the oil palm farmers were male. The fact that ownership of land is mostly vested on men in Africa which could be a factor that made it difficult for women to own oil

palm plantation. This is consistent with the findings of Raufu, Kibirige and Singh (2015) in their study of the perceived effect of climate change on cocoa production in South-Western Nigeria where it was discovered that 70.0% of the farmers were male.

Table 2: Gender distribution of respondents

Gender	Frequency	Percentage
Male	86	71.7
Female	34	28.3
Total	120	100

Source: Field Survey, 2016

Marital status - Table 3 shows that 68.3% of the respondents were married, 28.3% were single and 1.7% were divorced and also widowed. This implies that majority of the oil palm farmers in Okitipupa LGA were married. Being married by most of the farmers could be attributed

to the fact that in African society any person that is unmarried after a certain age would be regarded as a deviant from the culturally acceptable way of life. Being married could also assist in the supply of family labour in the oil palm enterprise.

Table 3: Distribution of respondents by marital status

Marital Status	Frequency	Percentage
Married	41	68.3
Single	71	28.3
Divorced	1	1.7
Widow	1	1.7
Total	60	100

Source: Field Survey, 2016

Household size - Table 4 shows that 61.7% of the respondents had household size of 6-10, while 35% had household size in the category of 1-5 members. About 3% was in the category of household size of 11 members and above. This shows that majority of the farmers sampled had a medium household size with only 6-10 members. The average household size of 7 people shows that the farmers had medium sized family. This trend possibly could result from the fact that most of the farmers were married and need family labour to

assist in their work. This contradicts the findings of Fasina and Odefadehan (2014) in which the average household size of respondents was 5 in a study of the use of mobile phone by farmers in Ondo state Nigeria. This difference could be explained by the need of higher level of labour specifically for large plantations especially in cash crop production like oil palm. The need of family labour could be responsible for the larger size in household size of oil palm farmers compared to categories of farmers.

Table 4: Distribution of respondents by household size

Household size	Frequency	Percentage
1-5	42	35
6-10	74	61.7
11 and above	4	3.3
Total	60	100

Mean= 7.0

Source: Field survey, 2016

Educational level - Table 5 shows that a greater percentage of the respondents (56.7%) had secondary school education, 21.6% attained tertiary education level, 17.5% had primary school education, and 4.2% of the respondent had no formal education. Therefore it can be deduced that a good number of farmers in the area were literate.

This hopefully will enhance the rate of acceptance of technological innovation and as such encourage extension agents to introduce new techniques. According to Nmadu, Sallawu and Omojeso (2015), sex and level of education of the farmers were among the variables that affected adoption decisions of cocoa farmers in Ondo state.

**Table 5: Distribution of respondents according to educational level**

Education level	Frequency	Percentage
No formal education	5	4.2
Primary education	21	17.5
Secondary education	68	56.7
Tertiary education	26	21.6
Total	120	100

Source: Field Survey, 2016

Farming experience - Table 6 shows that 70% of the farmers had 11-20 years of farming experience, 25% of the farmers had 1-10 year of farming experience, 3.4% of the farmers had 21-30 years experience and 1.6% of the farmers had 31-40 years of experience. The farmers' average

farming experience was 13 years. This shows that these farmers are not new in the cultivation of oil palm. This result is similar to the findings of Ajieh (2013), where the average farming experience in years of oil palm farmers in Ondo state was 14 years.

Table 6 Distribution of respondents by farming experience

Experience in year	Frequency	Percentage
1-10	30	25
11-20	84	70
21-30	4	3.4
31-40	2	1.6
Total	120	100

Mean= 13.0

Source: Field Survey, 2016

Farm size - Table 7 shows that 57.0% of the respondents own between 11-20 acres of farm land, 20.0% of them own 1-10 acres of plantation, 18.0% had 21-30 acres of farmland, while 5% had above 30 acres of farm land. The average farmland size of about 16 acres shows that oil palm farming

is practised on large land area compared to food crops arable farming. It can be said that it is beyond subsistence form but commercial in nature. This shows that these farmers have farms that are above the average national farm size of 1.8ha/farming household (FAO, 2018).

Table 7 Distribution of the respondents according to farm size

Farm size (acres)	Frequency	Percentage
1-10	24	20
11-20	68	57
21-30	22	18
Above 30	6	5
Total	120	100

Mean= 15.8

Source: Field Survey, 2016

Sources of labour - Table 8 shows that majority (78.3%) of the respondents used both hired and family labour for their farming, 18.3% used family labour for their farming activities, while 3.4% made use of hired labour only. This

implies that majority of the farmers interviewed used hired labour on their farm. Family labour is however used to complement the hired labour available in order to meet the labour supply needed on the farm.

Table 8: Distribution of the sources of labour used by respondents

Type of labour	Frequency	Percentage
Hired labour only	4	3.4
Hired and family labour	94	78.3
Family labour	22	18.3
Total	120	100

Source: Field Survey, 2012

Distance from farm to home - Table 9 shows that 75% of the respondent stayed between

11 and 20 kilometres away from their farms. Up to 23.3% stayed within distance of 1-10 kilometres

from the farm, while 1.7% stayed above 20 kilometres away from the farm. The average distance of about 13km to the farms shows that farmers would need a form of mobility i.e.

motorcycle in order to be effective. Trekking such a distance to and fro would amount to loss of time and energy that could be channelled to productive activities on the oil farm.

Table 9: Distribution of respondents according to distance from farm to their homes

Distance (km)	Frequency	Percentage
1-10	28	23.3
11-20	90	75
Above 20	2	1.7
Total	120	100

Mean = 12.8

Source: Field Survey, 2016

Problems encountered in oil palm farming - Table 10 shows that majority (96.7%) were facing inadequate funds in hiring labour, 73.3% claimed that weather change is a problem,

81.7% was confronted with inadequate infrastructure, unfavourable market and price instability each, while 70.0% regarded unfavourable government policies as a challenge.

Table 10: Distribution of respondents by problems encountered in oil palm production

Problems encountered	Frequency	Percentage
Inadequate funding	58	96.7
Weather change	44	73.3
Inadequate infrastructure	49	81.7
Unfavourable extension service	36	60
Unfavourable market and price stability	49	81.7
Unfavourable government policies	42	70

*multiple responses

Source: Field Survey, 2016

Labour requirements for the production of oil palm and palm oil production - The activities involved in oil palm production include; land clearing, planting of seedling, fertiliser application and harvesting while those in palm oil production are; fermentation, boiling, pounding/digesting, and matching/clarification of oil palm fruits and skimming of palm oil.

In Table 11, the overall average man hour of family labour used in the production of oil palm and palm oil was 213 man-hour compared to 1046 man-hour of hired labour. This implies that more of hired labour is used in oil palm and palm oil production. The highest man hour family labour and hired labour was used for harvesting.

Table 11: Labour requirements for production activities in oil palm and palm oil production

Activities	Family labour (Man hour)	Hired labour (man-hour)
Land clearing	430	714
Planting	148	626
Fertiliser application	61	346
Harvesting	519	3268
Fermentation	170	211
Boiling of oil palm fruits	151	1228
Pounding of palm fruits(Digesting)	181	1839
Matching, mixing with warm water (Clarification) and skimming	43	132
Total	1703 (Mean =213)	8364 (Mean= 1046)

Source: Field Survey, 2016

Influence of labour usage on oil palm and palm oil production in the study area

The R² of Cob-Douglas functional form was 0.44, showing that the variation in the explanatory variable has combined effect of 44 percent on the variation of the dependent variable.

Hence Cob-Douglas functional form was selected as the lead equation.

$$Y = 2.16 + 0.055\text{Log } X_1 - 0.123\text{Log}X_2 + 0.070\text{Log}X_3 - 0.441\text{Log}X_4 + 0.112\text{Log}X_5$$

(6.943) (0.001) (-0.939) (0.206)
(0.816) (0.025)



$R^2 = 0.44$; F-value = 14.486

The estimated regression function was evaluated in terms of the statistical significance of R^2 as indicated by F-value, the significance of the coefficients as given by the t-values, the sign of the coefficients, and the magnitude of the standard error. However, based on the statistical and economic criteria, the Cobb- Douglas form was selected as the lead equation for having the largest coefficient of determination (R^2) as shown in Table 12.

The coefficient of determinations (R^2) indicates that 44% of the variability in output of oil palm and palm oil production is explained by the independent variables (labour usage, level of experience, education level, age and farm size). According to Table 12, the labour usage in man days (X_1) in the study area has a coefficient of 0.055 as shown in the table 12 and is statistically significant at 5%. This is in line with our a priori expectation that labour use would be significant with output of oil palm and palm oil production.

Every unit increase in labour usage will increase output by 5.5%. Farm size is significant at 10% with coefficient of 0.112. This reveals that a unit increase in the land under cultivation will lead to 11 percent increase in output.

The level of experience of palm oil producers in the study area however has a negative coefficient of -0.123 and is not statistically significant; this shows that the higher the experience the lower the output. Likewise the age of the respondents has a negative coefficient but not statistically significant. The negative coefficient of the experience of the farmers is contrary to our apriori expectation and such could be attributed to reluctance in accepting new innovations as the farmers stays longer in the enterprise. There are possibilities of regarding themselves as authority in oil palm and palm oil production as years passed by. New and inexperienced farmers could be easier to convince on innovations.

Table 12: Regression results of the influence of labour and other variables on oil palm and palm oil production

Functional forms Variables	Linear Coefficient/t-value	Semi Coefficient/t-value	Cob-Douglas Coefficient/t-value
Constant	2918.21 (0.905)	-8616.607 (-1.479)	2.161 (6.943)
Labour usage (in man days)	9.191 (5.754)	2743.613 (3.919)	0.055* (0.001)
Years of experience	-45.619 (0.489)	-209.928 (-0.197)	-0.123 (-0.939)
Education level	698.217 (-0.756)	1907.543 (-0.688)	0.070 (-0.206)
Age	-1.325 (2.711)	-0.568 (2.135)	-0.441 (0.816)
Farm Size	0.968 (1.942)	0.322 (2.215)	0.112** (0.025)
R^2	0.383	0.226	0.441
Adjusted R^2	0.35	0.182	0.407
F-value	11.61	5.458	14.486

Source: Field Survey, 2016

N=120

* Significant at 5%,

**Significant at 10%

CONCLUSION AND RECOMMENDATION

Conclusively, the study reveals that the main source of labour in oil palm and palm oil production is hired labour. Labour and farm size are important determinants in the output of oil palm. It is recommended that farmers should come together to form cooperative society in order to benefit from credit facilities. This will make funds to pay for hired labour easily available. In addition policies that will make it easy for women to own land should be enacted.

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