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**THE IMPACT OF RURAL-URBAN MIGRATION ON PLANTATION  
AGRICULTURE IN THE NIGER DELTA REGION, NIGERIA**

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ABSTRACT

This study was carried out to unveil the impact of rural-urban migration on plantation agriculture productivity in the Niger-Delta Region of Nigeria. Data were collected from 660 rural households and managers/supervisors of 15 selected oil palm, rubber and cocoa plantations in the Niger-Delta Region. Descriptive statistics and multiple regression analysis were used to analyze the data. Most migrants were able bodied young adults. Labor shortage was experienced by all the visited plantations. Due to labor shortages, most of the plantations could not harvest completely. This resulted in foregone revenue for the plantations. Rural-urban migration significantly and positively correlated with labor shortage, incomplete harvesting and foregone revenue. It was recommended that the government should invest in infrastructure development of the rural sector and in cooperation with donors, should encourage engineering departments of our universities to develop simple machines that can compensate for labor shortages in the plantations.

Migration refers to the movement of people from one geographical location to another, either on a temporary or permanent basis (Ekong 2003). It is a common observation all over the world that rural-urban migration is the dominant pattern of internal migration. Migration is a selective process affecting individuals or families with certain economic, social, educational and demographic characteristics. People migrate in response to prevailing conditions and the reasons for it differ from one individual to another.

The agricultural history of Nigeria, according to Onlinenigeria (2012), is intertwined with its political history. This is discussed broadly in the context of the varying constitutional frame works such as: Colonial, the Internal Self Government and the Post-1960 periods. The period of the colonial administration in Nigeria, 1861-1960, was punctuated by rather ad hoc attention to agricultural development. During the era considerable emphasis was placed on research and extension services. The first notable activity of the era was the establishment by Sir Claude McDonald of a botanical research station in Lagos in 1893. This was followed by the acquisition of 10.4 kms of land in 1899 by the British Cotton Growing

Association (BCGA) for experimental work on cotton. It was named the Moor Plantation in Ibadan. In 1912 a Department of Agriculture was established in the then southern and northern regions of Nigeria, but the activities of the departments were virtually suspended between 1913 and 1921 as a result of the First World War and its aftermath.

From the early 1920s to the mid-1930s there was a resurgence of activities and this period has been called the "Faulkner Strip Layout" era in honor of the Director of Agriculture, Mr. O.T. Faulkner, who devised a statistical design for experimental trials in green manuring, fertilizer projects, rotational cropping systems and livestock feeding. From the late 1930s to the mid-1940s there was significant intensification and expansion of research activities, and extension and training programs of the agricultural departments.

Production of export crops like palm products and rubber which could not be obtained from Malaysia as a result of Japanese war activities in South east Asia, and such food items as sugar, wheat, milk, eggs, vegetables, Irish potatoes and rice whose importation was prevented as a naval blockade of the high seas increased. A special production section of the Department of Agriculture was set up to deal with the situation. On the research side, attention was devoted largely to the possibilities of evolving permanent systems of agriculture that were capable of replacing rotational bush-fallowing systems prevalent in the country and realizing the promises of mixed farming in the North. During this period, the WAIFOR (West African Institute for Oil Palm Research) in Benin was started and the research on cocoa was intensified at Moor Plantation, Owena near Ondo and at Onigambari near Ibadan.

There was the boom in agriculture, especially plantation farming, in the period, but as Nigeria gained independence, there came the oil boom. The oil boom led to rapid urbanization as a result of the influx of oil exploring and servicing companies in the study area. The entry of various Christian missionaries who established schools prompted a lot of children to acquire education. When the oil boom came most of the educated youth abandoned farming to work in the exploring and servicing companies and ministries. The educated ones started looking down on farming as they preferred the white collar jobs to farming. That was how the agricultural sector, including the plantation sub-sub-sector, started losing labor to other occupations, both locally and through rural-urban movements of people. However, it is difficult to strictly pin-point the causes of migration as such, since causation connotes absoluteness whereas it is usually difficult to cite this or that factor as the absolute cause of an individual's decision to relocate (Ekong 2003). It

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is therefore more scientific (Ekong 2003) to refer to the correlates of migration factors that are systematically related to the phenomenon of migration without necessarily proving causation. Most rural-urban migration studies tend to conclude that people primarily migrate for economic reasons, and the need to escape from adverse social and physical conditions. For instance, Von Braun (2004) suggests that people tend to be pulled to areas of prosperity and pushed from areas of decline.

Tadaro (1976) stated that migrants do not typically represent a random sample of the overall population. Most migrants rather tend to be young, formally-educated, less risk-averse and more achievement-oriented and they also tend to have a better network of connections in other areas than does the general population in the region of out-migration. This is especially so with those involved in rural-urban migration. Okpara (1983) in his studies revealed that migrants involved in rural-urban migration are always many compared to those engaged in urban-rural migration. Rural-urban migration negatively impacts on the quality of rural life, especially when such migrants carry away their needed productivity into the city (Adewale 2005). Migration of young adults from the rural to urban areas places a greater burden on the farmers, he further stated. This is attributed to the fact that farmers spend more time to cover the same area of land than when he or she had the assistance of the migrant, thereby depriving himself of leisure time and involvement in many social activities.

However, two contradictory conclusions emanate from the impact of rural-urban migration on rural development, of which agricultural development forms a part and parcel. On one hand, some scholars opine that there are positive consequences in terms of increasing labor scarcity which emerge from migration and productivity outcome and wage increases in the rural areas (Nicholls 1964). Nicholls emphasizes the possibility of land consolidation and reduced land values as benefits to rural areas. Berg (1966) is of the opinion that rural-urban migration leads to a better reallocation of labor, especially in countries with regional resources disparities, which enhances the efficiency of resource use. On the contrary, Tadaro and Harris (1971) are of the opinion that a fall in agricultural output is likely to emanate from rural-urban migration, given the existence of a positive marginal product of labor in agriculture, especially in the relatively land abundant economies of Africa, Latin America and a number of South Asian countries. Hathaway (1964) observed in the United States that out-migration of young workers to urban areas breeds a higher age level of the labor force in the source rural area. To him, this is an important factor that inhibits the adjustment process, which largely accounts for low productivity and stagnation in the affected rural settlements. In most rural

areas, the impact of rural-urban migration is a rapid deterioration of the rural economy leading to chronic poverty and food insecurity (Mini 2000).

The above discussion of the effects of rural-urban migration on the rural sector has led to two conflicting conclusions, given the differences in assumptions underling the discussion, as well as variations in the stages of economic growth, population density, social organization of diverse communities and their economic characters and resource endowment. In a situation where rural-urban migration takes place in a settlement characterized by gross diminishing returns due to population pressure and uneconomic land holdings, the consequent decrease in agricultural population can hypothetically reduce the tendency to diminishing returns and so raise the productivity of agricultural labor. On the other hand, if the density of agricultural population is low, rural-urban migration may lead to a reduction in agricultural output unless compensating yield-increasing innovations are introduced or the vacuum created by rural-urban migrants is filled by rural-rural migrants (Udo 1970). The extent of a community's dependence on manual labor, especially that provided by men, may also influence the extent to which output and income will be affected in the rural areas. In southern Nigeria, bush clearing and harvesting of export crops is done almost completely by male manual labor. This may lead to shortage of labor and output reduction due to rural-urban migration. The predominant plantation crops (export crops) grown in the Niger Delta Region of Nigeria include oil palm, rubber and marginally, cocoa. Individuals and corporate bodies participate in plantation agriculture in the region. Most of the activities are dominated by the males with females as helping hands. The labor involved is intensive, especially with oil palm harvesting and processing.

It is glaring from the above earlier discussion that definite statement cannot be made on whether rural-urban migration is beneficial or detrimental to agricultural development, especially with respect to plantation agriculture. It is, therefore, pertinent that this study should be carried out to unveil how rural-urban migration impacts on plantation agriculture, which is the major source of export crops in the Niger Delta Region of Nigeria.

## OBJECTIVES

The major objective of this study was to present some empirical evidence of the effects of rural-urban migration on plantation agricultural productivity in the Niger Delta Region of Nigeria. The specific objectives were to:

1. ascertain the rate of rural-urban migration by age of migrants in selected rural communities.

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2. determine the impact of rural-urban migration on labor in the plantations.
3. ascertain the impact of rural-urban migration on harvesting of the crops.
4. estimate the foregone revenue due to incomplete harvesting.

#### HYPOTHESIS

There is no significant relationship between rate of rural-urban migration and labor shortage, incomplete harvesting of farm, and forgone net revenue.

#### METHODOLOGY

This study was carried out in the Niger Delta Region of Nigeria. It consists of the states surrounding the River Niger Delta in southern Nigeria. These states are Edo, Delta, Bayelsa, Rivers Akwa-Ibom and Cross River States. Plantation crops which form the major export crops in Nigeria are cultivated here. These states, apart from their capital cities, have a lot of urban settlements with surrounding rural settlements. A purposive sampling technique was used to select households from which migration has taken place for the study at the first stage. At the second stage plantations were randomly selected to include oil palm, rubber and cocoa plantations.

Rural households of migrants were identified with the help of rural community leaders. Forty-four (44) household heads were selected from the identified households in plantation communities in each state, totaling 660 household heads. These household heads were then interviewed and data obtained on the number and ages of household members who migrated to urban areas. At the second stage, government-owned and private plantations in the Niger Delta Region were purposively selected from the selected household communities. Data were collected by interviewing the managers, labor supervisors and from records on plantation size, total number of hectares cultivated, total number of hectares harvested in 2010, size and pattern of labor used, regularity of available labor, and wage rate.

From data collected, the rate of labor shortage was derived as the difference between labor required and actual number of persons employed in 2010 expressed in percentage of labor required. This method was adapted from Essang and Mabawonku (1974). The percentage of total cultivable hectares not cultivated and the percentage of cultivated hectares that could not be harvested in 2010 due to inadequate supply of labor were also computed from the data. The loss of output due to incomplete harvesting was then estimated in physical and in revenue terms after making allowances for potential cost of harvesting the portions not harvested.

The hypothesis was analyzed with the use of a regression model succinctly stated as follows:

$$Y = f(x_1, x_2, x_3, \mu)$$

Where:

Y = Rural-Urban migration rate (no of migrants from plantation communities)

X<sub>1</sub> = Labor shortage (no persons)

X<sub>2</sub> = none harvested portions of plantations (hectares)

X<sub>3</sub> = Forgone net revenue (N)

μ = Error term

Three functional forms of the model – linear, semi log and double log - were tried and the one with the highest R<sup>2</sup> value and largest number of significant variables was adopted.

First, the yield per ton of each plantation was multiplied by the total number of hectares not harvested to obtain the forgone potential yield in physical units. Using the 2009/2010 weighted average producer prices of cocoa, palm oil and kernel, and natural rubber, the amount of potential gross revenue foregone was computed. Second, the additional expenditure which would have been incurred in an effort to complete harvesting was estimated by multiplying the expenditure per hectare by the number of hectares not harvested. The difference between gross revenue and this additional outlay is the net revenue forgone by the failure to complete harvesting. It is necessary to stress that several assumptions underlie the computational exercise described above as has been made clear in the next section dealing with the data limitations. Moreover, the authors are perfectly aware that there exist other theoretically satisfactory approaches to determining output loss due to incomplete harvesting. However, the above approach is adopted because it is mostly used by plantation managers. Project appraisal studies also use this approach, with appropriate discounting to determine the profitability of agricultural projects (Essang and Mabawonku, 1981).

#### LIMITATIONS

The major limitation emanates from the assumptions of constant yield and constant per hectare expenditures underlying the computations. Another limitation is that because managers of plantations and accountants utilize broadly different

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methods for computing depreciation of buildings and machinery, there is the likelihood to inflate production costs in some of the plantations much more than others. This affects the estimate of the potential additional outlay and therefore, the estimate of potential net revenue foregone.

## RESULTS AND DISCUSSION

The trend of rural-urban migration is age selective (Table 1) as most (51.7%) of the migrants for the past 10 years were in the age bracket of 21-30 years. Similarly, 30.5% of those in the age range of 11-20 years migrated to urban areas. The data indicate that most (82.2%) of those who migrated from the rural areas to urban areas were in the age bracket of 11-30 years. In contrast, a small percentage of those in the age brackets of 0-10 years (2.4%), 31-40 (9.1%) and 41-50 years (6.4%) had migrated to urban areas. This is congruent with Ekong (2003) who stated that most migrants tend to be disproportionately young.

TABLE 1. RATE OF RURAL-URBAN MIGRATION BY AGE OF THE RURAL FAMILY MEMBERS IN SELECTED HOUSEHOLDS FOR THE LAST 10 YEARS AS AT 2010

AGE (YEARS)	N	MIGRATION RATE (%)
0-10.....	16	2.4
11-20.....	201	30.5
21-30.....	341	51.7
31-40.....	60	9.5
41-50.....	42	6.4
Above 50.....	0	0.0

The implication in terms of the labor supply for plantation crops production is that rural-urban migration has relocated the required most productive age group to urban areas. These people are those who usually provide most of the labor needed for heavy operations in land preparation, planting, harvesting and processing. Though in theory plantation farmers and managers could react by substituting machines for human labor or by hiring labor from other rural settlements, in practice it is not possible for machines to carry out all the operations. For example, machines cannot be used for planting and harvesting of the products. They can only be used for land preparation and processing. Even



during processing operations human labor is also highly required. According to Soqalli (2008), as a result of city congestion, traffic jams, increasing urban unemployment, sanitation problems, housing problem and increased crime rate, the urban areas need to be decongested and the only solution to this situation is a reversal of movement.

*Impact of Rural-Urban Migration on Labor for Plantations in the Niger Delta Region of Nigeria*

Table 2 indicates that many large-scale, tree crop plantations in the Niger Delta Region have the challenge of labor shortage of between 10% and 35% of the required labor. This finding is in consonance with Tuan, Somwaru, and Diao (2000), Ekong (2003), and Adewale (2005) who opine that migration from rural into urban areas tends to deplete the agricultural labor force as it is the able-bodied young men who usually move. Tree crop plantations will continue to suffer from labor shortage problems due to rural-urban migration because young men are no longer committed to agriculture and there is the irresistible attraction to urban life and its amenities, which is distinguished with the dullness and monotony of life in the plantations. The aforementioned reasons look plausible for the fact that on the average, the wage rates for unskilled labor on these plantations were the same as those paid in urban areas. If plantation wage rates were computed to include fringe benefits enjoyed by plantation workers, they would be higher than the current wage rates for unskilled labor. This would even be more so when expenses in the urban were taken into consideration. To this end, it should be remembered that benefits in the plantations include free quarters, opportunities to raise crops on side plots, free usage of utilities like electricity, water, etc. Unionized plantation workers also benefit from minimum wage legislation.

*Impact of Rural-Urban Migration on Harvesting of Crops.*

Table 3 shows that twelve of the fifteen plantations recorded incomplete harvesting ranging from 2.3% to 44.1% of total cultivated hectares. Incomplete harvesting percentages reported were recorded in old oil palm plantations with very tall trees. Those that recorded '0' were immature. Similar results were obtained by Essang and Mabawonku (1980) in an earlier study in eastern and western Nigeria. These results confirm the observation of Kande (2003), Adewale (2005) and Ekong (2003) that with no commensurate substitution of the displaced labor, agricultural productivity tends to fall in the source region. Incomplete harvesting is expected to have economic implications in terms of foregone revenue.

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TABLE 2. LABOR SHORTAGE IN SELECTED PLANTATIONS 2010.

PLANTATION CODE #	LABOR REQUIRED (PERSONS)	LABOR EMPLOYED (PERSONS)	LABOR PERSONS	SHORTAGE % OF LABOR REQUIRED
P <sub>1</sub> . . . . .	2362	1672	690	29.1
P <sub>2</sub> . . . . .	592	472	128	21.6
P <sub>3</sub> . . . . .	695	532	163	23.1
P <sub>4</sub> . . . . .	800	675	125	15.6
P <sub>5</sub> . . . . .	3960	3546	414	10.5
P <sub>6</sub> . . . . .	2040	1884	156	7.6
P <sub>7</sub> . . . . .	1772	1492	280	15.8
P <sub>8</sub> . . . . .	1266	1040	226	17.9
P <sub>9</sub> . . . . .	580	460	120	20.7
P <sub>10</sub> . . . . .	760	582	178	23.4
P <sub>11</sub> . . . . .	40	26	14	35.0
P <sub>12</sub> . . . . .	500	450	50	10.0
P <sub>13</sub> . . . . .	80	52	28	35.0
P <sub>14</sub> . . . . .	540	437	103	19.1
P <sub>15</sub> . . . . .	582	520	63	10.8

NOTE: Code number is used to honor the anonymity agreement with plantation managers;

SOURCE: Plantations managers

Table 4 indicates that apart from the plantations (P<sub>6</sub>-oil palm; P<sub>7</sub>-cocoa; and P<sub>15</sub> – rubber plantations) that had not attained maturity, twelve of them lost various amounts of money ranging, according to size of portions not harvested, from N495,746.05 to N14,910,677.7 in 2010. These amounts of money would have been added revenues to the various plantations if the required labor were available to carry out complete harvesting of the plantations. This confirms an earlier prediction that the shortage of labor would have economic implications in terms of revenue foregone. This is congruent with the observation of Afolabi (2007) who stated that rural-urban migration negatively impacts agricultural productivity through loss of productive members of the rural communities. Waddington (2003) suggests that

TABLE 3. HECTARES NOT HARVESTED AS A PROPORTION OF TOTAL HECTARE CULTIVATED.

PLANTATION CODE #	NUMBER OF HECTARES CULTIVATED	NUMBER OF HECTARES HARVESTED	UNHARVESTED % OF HECTARES CULTIVATED
P <sub>1</sub> . . . . .	2925.77	288.81	9.9
P <sub>2</sub> . . . . .	1425.99	381.48	26.7
P <sub>3</sub> . . . . .	1926.59	45.18	2.3
P <sub>4</sub> . . . . .	1743.00	573.04	32.9
P <sub>5</sub> . . . . .	9348.34	1254.54	13.4
P <sub>6</sub> . . . . .	5110.43	0.00	0.0
P <sub>7</sub> . . . . .	2908.91	0.00	0.0
P <sub>8</sub> . . . . .	2566.54	802.09	31.3
P <sub>9</sub> . . . . .	5368.62	1903.66	35.5
P <sub>10</sub> . . . . .	2380.39	551.19	23.2
P <sub>11</sub> . . . . .	113.31	48.56	42.9
P <sub>12</sub> . . . . .	2946.14	412.78	14.0
P <sub>13</sub> . . . . .	75.19	33.18	44.1
P <sub>14</sub> . . . . .	1530.13	524.48	34.3
P <sub>15</sub> . . . . .	1734.33	0.00	0.0

SOURCE: Plantations managers

23 out of 44 country poverty reduction strategy papers (PRSPs) consider migration as a cause of degradation of rural resources. Fadayomi (1998) recalls that internal migration has a negative impact on the quality of rural life because it reduces the population of individuals in rural area. The reduction in the number of individuals in the rural areas contributes to a labor deficit in the rural areas. In his study, Afolabi (2007) discovered that rural-urban migration correlated with productivity of four crops in Nigeria. This finding supports his hypothesis that as more individuals relocate from the rural areas, there will be fewer able bodies on the farm and this will have a negative impact on future agricultural output and productivity.

TABLE 4. ESTIMATED REVENUE OWING TO UNDER- HARVESTING IN THE SELECTED PLANTATION IN 2010.

PLANTATION CODE	SIZE OF UNHARVESTED PARTS OF PLANTATION	EXPENDITURES PER HA. (₦)	POTENTIAL EXPENDITURES (₦)	POTENTIAL GROSS REVENUE (₦)	FOREGONE NET REVENUE (₦)
P <sub>1</sub> . . . . .	288.81	4,591.50	1,326,071.10	2,982,219.40	1,656,148.30
P <sub>2</sub> . . . . .	381.48	4,546.55	1,734,417.89	4,094,807.01	2,360,389.17
P <sub>3</sub> . . . . .	45.18	6,090.00	275,146.20	1,003,584.30	728,438.10
P <sub>4</sub> . . . . .	573.04	6,075.20	3,481,332.60	7,012,886.10	3,531,553.50
P <sub>5</sub> . . . . .	1,254.54	6,724.52	8,436,179.32	15,044,182.20	6,608,002.88
P <sub>6</sub> . . . . .	0.00	N/A	N/A	N/A	N/A
P <sub>7</sub> . . . . .	0.00	N/A	N/A	N/A	N/A
P <sub>8</sub> . . . . .	802.09	1,234.00	989,779.06	3,082,817.59	2,093,038.53
P <sub>9</sub> . . . . .	1,903.66	15,690.00	29,868,425.40	44,779,103.10	14,910,677.70
P <sub>10</sub> . . . . .	551.19	9,370.54	5,164,947.94	7,733,366.12	2,568,418.18
P <sub>11</sub> . . . . .	48.56	7,296.30	354,308.32	1,120,518.03	766,209.71
P <sub>12</sub> . . . . .	412.78	8,367.80	3,454,060.48	5,668,539.02	2,214,478.54
P <sub>13</sub> . . . . .	33.18	6,345.00	210,527.10	706,273.15	495,746.05
P <sub>14</sub> . . . . .	534.48	6,391.55	3,352,240.14	6,818,772.89	3,466,532.75
P <sub>15</sub> . . . . .	0.00	N/A	N/A	N/A	N/A

SOURCE: Plantations managers; N/A – Not available; US\$1= N150.00

The implication is that labor force availability is an important instrument for promoting agricultural productivity.

*Relationship between Migration and Labor Shortage, Incomplete Harvesting and Foregone Revenue*

It was hypothesized that there was no significant relationship between migration and labor shortage, incomplete harvesting and foregone revenue. In testing this hypothesis, three functional forms of multiple regression models – linear, double log and semi-log – were fitted to determine the function with the best fit. The linear function was adopted as the lead equation because its equation showed goodness of fit considering the quality of its coefficients, R-square, F-ratio and the number of significant variables. The  $R^2$  value of 0.886 indicates that 88.6% of the parameter estimates are responsible for the result obtained. The parameters of the estimated linear regression model are shown in Table 5. Labor shortage ( $X_1$ ); portion not harvested ( $X_2$ ) and foregone revenue ( $X_3$ ) foregone revenue were positively and significantly correlated with rural-urban migration. The implication is that the more able bodied young adults migrate from rural to urban areas, the higher the level of labor shortage. The higher the number of rural-urban migrants, the larger the area that could not be harvested as a result of the dearth of labor. The higher the rate of rural-urban migration the more the revenue forgone will be, because of the shortage of labor created by rural-urban migration. This is congruent with Essang and Mabawonku (1975), Tuan et al. (2000), Ekong (2003), Kendel (2003), Ray (2004), Adewale (2005), Afolabi (2007) who discovered that rural-urban migration have negative consequences on agricultural production in the source area. Based on the results obtained, the hypothesis of no significant relationship between dependent variable and independent variables.

## CONCLUSIONS AND RECOMMENDATIONS

Rural-urban migration is a challenge to the agricultural sector of the Niger-Delta Region. Most of the migrants were able bodied young adults who form the bulk of the agricultural labor force. There were cases of labor shortages in the selected plantations and this resulted in incomplete harvesting in most plantations, which culminated in forgone revenue of various amounts. Rural-urban migration significantly and positively correlated with labor shortage, incomplete harvesting and forgone revenue. It is therefore concluded that rural-urban migration negatively impacted plantation agriculture. Considering the aforementioned facts, it is recommended that the governments of the various states that constitute the

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TABLE 5. ESTIMATE OF RELATIONSHIP BETWEEN MIGRATION AND LABOR SHORTAGE, INCOMPLETE HARVESTING AND FOREGONE REVENUE

VARIABLE	COEFFICIENTS	STD. ERROR	T-STATISTIC
Intercept. . . . .	46.439	0.548	84.693**
Labor Shortage ( $X_1$ ). . . . .	0.147	0.014	1.862*
Unharvested portion ( $X_2$ ). . . . .	0.0103	0.0026	4.048*
Revenue forage ( $X_3$ ). . . . .	6.80479E <sup>-07</sup>	3.5940E <sup>-07</sup>	1.893*
R <sup>2</sup> . . . . .		0.886	
F. . . . .		28.588	

NOTE: \* = Significant at 10% level; \*\* significant at 1% level

Niger-Delta Region should invest in rural infrastructures to facilitate the development of non-farm sector of the rural areas in order to reduce the rate of rural-urban migration to the barest minimum and retain young men in the rural settlements. Government and aid donors need to encourage engineering departments in our universities to develop simple machines that are adapted to the ecological conditions of the Niger-Delta Region, for use in these plantations to compensate for labor shortages.

## AUTHOR BIOGRAPHIES

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