Effect of Yam-Based Production on Poverty Status of Farmers In Kabba/Bunu Local Government Area of Kogi State, Nigeria

Igbinidu Osayande[1], Julius I. Osabuohien[2]

[1,2]Department of Agricultural Economics and Extension Services, University of Benin, Nigeria

Abstract— *Poverty as a scourge is multi-dimensional in scope and needs concerted efforts to resolve. The study focused on the effect of yam-based farming on poverty status of farmer in Kabba/Bunu Local Government Area (L.G.A) of Kogi State, Nigeria.*

Specifically, the objectives were to examine the socio-economic characteristics of yam farmers in the study area, determine the effects of yam-based farming on their economic status, examine their level of poverty and examine the determinants of poverty status. Data for the study was obtained from a well-structured questionnaire administered to 120 respondents selected from the study area. Data analysis was done using simple descriptive statistics, poverty line analysis and logit model, the hypothesis was tested using t-test statistics.

The results showed that without income from yam production 68.5% of the respondents were below the poverty line while 31.5% of the respondents were above poverty line. But with yam production, the annual income of the respondents significantly scaled up (P < 0.05) with the proportion of the poor and non-poor being 29% and 71% respectively: Respondent perceived benefits derivable from yam-based production at (mean ≥ 3.00); were absence of hunger in the households (mean ≤ 4.42); affording better medical services (mean 4.26); ability to pay school fees (mean = 4.07) and payment of house rents (mean 3.44) among others. Finally, the results also revealed that three variable in the logit regression model were significant in explaining variation in the poverty status of the farming households. These are farm size, income from yam-based production and non-farming activities. It was recommended that government should provide bigger plot of land for those farmers who are determined to take farming as business and youth should be empowered in rural areas for farming.

Keywords— *Effect, yam-based farming, poverty status, Kabba/Bunu.*

I. INTRODUCTION

Nigeria is a country of absurd economic realities. The 13th largest crude oil producer in the world and the second largest economy in Africa, earning an estimated $2.2 million a day in oil revenue. Yet, its G.D.P per capital, at just over $1,400, is among the lowest for the continent and 54% of its 148 million people live on less than $1 per day (World Bank, 2000, 2002 and 2004). The figures are especially shocking because of the abundance of natural resources primarily oil and natural gas, and massive agricultural potential based on its climate and significant rural populations.

Human development data for Nigeria has remained persistently bleak despite considerable upturn in the country's economic fortunes since 2000. The UNDP (2014), ranked Nigeria 80th in a poverty survey of 108 developing nation's that focused on severe deprivation. Nigeria has 37 of human poverty index, thereby placing it below more improverished Africa neighbours with smaller economies.

The number of poor Nigerians is put as 58 million or 33.1 percent of the population. This represents an improvement from the previous study conducted in 2009/2010 which put the poverty level at 61% of Nigeria's population. According to Bank of Industry (2014), small holder farmers among the micro, small and medium scale enterprises, MSMEs, constitutes the essential ingredient to lubricate and develop the Nigeria economy to lift citizens out of poverty.

Poverty is a term that has been variously defined. The World Bank (2002 and 2004) defined poverty as a multidimensional phenomenon which can be described as pronounced deprivation in well-being with the other aspects encompassing the psychological pain of being poor and a sense of powerlessness vis-à-vis the state and societal institution. Onyido (2000) viewed poverty in broader terms, as a situation of low to no capacity for access to basic means of livelihood arising from the separate, combined, or cumulative responses to the complex degrees of the interplay of economic, socio-political and the physical environment. The critical elements involved in the interplay and the policy framework under which they exist are both inter-ministerial and multi-sectoral in nature. Abiola and Oluopa (2008) also articulated that the scourge of poverty in

Nigeria is an incontrovertible facts, which results in hunger, ignorance, malnutrition, disease, unemployment, poor access to credit facilities and low life expectancy as well as a general level of human hopelessness.

Generally, about 90 percent of Nigeria's poor are engaged in agriculture, while 58 percent of the urban population is living in poverty (Ogunlela, Ogungbile, 2006). Knowing what poverty is not enough, it is important to know the measures to take towards its reduction. Poverty alleviation describes strategies to eradicate poverty. It is any process which seeks to reduce the level of poverty among a group of people. It involves improving the lives of poor people (Shringal, 2000).

Since the source of livelihood and income generation of majority of the poor is agriculture, alleviating poverty entails boosting agricultural production. Yam farming is one of the means of solving this poverty problem, yam is a staple food, accepted and eaten in various form in every part of Nigeria. It is therefore a source of food security and also a source of income among rural farmer, its favorable economic prospects are obviously essential to making a strong case for increasing the research investment in yams.

The critical question now is, what is the effect of yam production on poverty status? It is in an attempt to answer this question that the study sought to examine the effect of yam-based production on poverty status on farmers in Kabba/Bunnu Local Government Area in Kogi State of Nigeria. The specific objectives of the study were to profile the socio economic characteristics of yam farmers in the study area, examine their poverty status; determine the effect of yam-based production in improving their economic status and examine the determinants of poverty among farmers.

II. METHODOLOGY

Kabba / Bunu L.G.A is made up of fifteen wards which are Asula, Odo-Akete, Okekoko, Odolu, Aiyewa, Aiyeteju, Otu, Egbeda, Okedayo, Akutuparkixi, Aiyeteju-kiri, Iluke, Olle/Oke-Ofin, Odoape and Oke Bukun.

A two-stage sampling technique was used to arrive at the sample size. The first stage involves a random selection of 6 villages from the list of villages obtained from the Local Government Area headquarter followed by the second stage in which 20 farmers from each of the 6 villages were selected by a method of snow balling techniques, giving a total sample size of 120 respondents. However, 108 respondents were eventually used being the questionnaire successfully retrieved.

Data collection for the study was achieved using a well-structured pre-tested questionnaire administered to respondents. The data were collected on the 2013 production season. Data analysis was done using descriptive statistics, Foster, Greer, and Thorbecke poverty index and poverty line, logit model and t-test was used to test hypothesis. Likert scale was employed to measure the significance of the benefits from yam production.

2.1 Poverty Line Analysis

The class of decomposable poverty measures by Foster, Greer and Thorbecke (FGT) was used in this analysis. They are widely used because they are consistent and additively decomposable (Foster, Greer and Thorbecke, 1984).

The FGT index is given by

$$P_{\propto} = {}^{1}\!/_{N} \sum_{i=1}^{q} \left(\frac{Z - Y_1}{Z} \right)^{\propto}$$

Where

Z is the poverty line defined as $\frac{2}{3}$ of the Mean Per Capita HouseHold Expenditure (MPCHHE),

Y_1 is the value of poverty indicators / welfare index per capita in this case per capita expenditure in increasing order for all households.

q = is the number of poor people in the population of sizes N

$\propto$ = is the poverty aversion parameter that takes values of zero, one or two.

The measures subsumes the head count index, and the poverty gap and provides the distributionally sensitive measures through the choice of a poverty aversion parameter "N"; the larger the value of the "μ", the greater the weight given by the index to the severity of poverty (Anyawu, 1997).

The $\propto$ takes on a value of 0, 1, 2 with different implications

i.   When $\propto$ = 0, it measures poverty incidence. This translates to the head count ratio (Angawu, 1997) that is the percentage of the population below poverty level.

ii.   When $\propto$ = 1, it measures the depth of poverty or poverty gap; that is the proportion of the poverty threshold (line) that the average poor will require to at least attain poverty line.

iii.   When $\propto$ = 2, it measures the severity of poverty, that is how serious poverty is, it gives more weight to the poorest. The closer the value is to 1 the higher the seriousness of poverty.

Likert Scale: To determine the relevance of benefits derivable from yam-production to the respondents, a 5-point Likert scale of strongly agree (code 5), agree (code 4), undecided (code 3), disagree (code 2) and strongly disagree (code 1) was used. A mean score of less than 3.00 mean indicate they were not significant.

Logit Model: This was employed to determine the factors influencing the poverty status of the respondents. The relationship explicitly expressed as:

$$Y_1 = f(x_1, x_2, x_3, x_4, x_5, x_6, x_7, et)$$ (1)

Where

Y_1 = poverty status (non-poor = 0, poor = 1)

x_1 = Age of respondent (years)

x_2 = Household size (per head)

x_3 = Educational level (years of education)

x_4 = Farming experience (years)

x_5 = Farm size (hectares)

x_6 = Income from yam production (Naira (₦))

x_7 = Income from other production activities (Naira (₦))

et = error term

The logit model according to Aidrich and Nelson (1984) is expressed as:

$$P\left(Y_1 = 1/X_i\right) = exp\left(\Sigma bk\, X_{ik}\right) \Big/ r + exp^{(\Sigma bk\, X_{ik})}$$

(2)

r = 1, …N; k = 1, …………..7

the parameters of the model are estimated using the maximum likelihood estimation (MLE_. This in logarithms form, is expressed as;

$$\text{Log L}\left(y^N / x_i b\right) = \sum \left[yi \log pi + (1 - yi) \log(1 - pl)\right]$$

(3)

t-test statistics was used to test the significant difference between income of the respondents with yam production and their income without yam production.

III.   RESULTS AND DISCUSSION

3.1   Socio-Economic Characteristics of Respondents

Table 1 shows that yam production in Kabba/Bunu Local Government Area of Kogi State was dominated by male (92.6%) while few females are into yam-based production (7.4%), this may be due to the fact that yam-production is a very laborious enterprise. The table also shows an average age of 50 years. Ibitoye and Onimisi (2013) observed similar average age of yam farmers in the same Local Government Area. This reveals that farmers were ageing suggesting that the farming population is gradually being phased out, this is a threat to the future of agriculture in the country. Also, majority (88.3%) of those sampled were married, this corroborate the findings of Ekong (2003), that society places high value on marriage with the married people assumed to be more responsible than the unmarried in addition to having tendency to help beget farmhands.

Majority (91.6%) of the households had household size of between one and eight persons on headcount basis, with the mean being seven people. The relatively high households size could pose a threat by the likelihood of increasing the poverty status of the household members, especially the low income group and this is particularly so, if the increase in household size translates to increasing number of children who do not contribute to the total household labour force and household income. The mean farm size was estimated to be 1.0 ha, farm size is expected to be positively correlated to food security and poverty reduction. Sanginga (2012) observed that there are three million small-holder farming families across Ghana and Nigeria, 90% of whom cultivated less than 2.5ha and this agrees with the 1.0 hectares of this study and that of Izekor and Olumese (2010) that over 90% of the country food supply comes from smallholder farmers.

TABLE 1
DISTRIBUTION OF RESPONDENTS ACCORDING TO THEIR SOCIO-ECONOMIC VARIABLES

Variables		Frequency	Percentages (%)	Mean ($\bar{x}$)
Sex	Male	100	92.6	
	Female	8	7.4	
	Total	108	100	
Age (years)	≤ 30	8	7.4	
	31 – 40	26	24.1	
	41 – 50	36	33.3	
	51 – 60	27	25.0	50
	61 – 70	10	9.3	
	> 7+	1	0.9	
Marital status	Single	10	9.3	
	Married	96	88.3	
	Divorced	1	0.9	
	Widow(er)	1	0.9	
House size range	≤ 4	36	33.3	
	5 – 8	63	58.3	
	9 – 12	7	6.5	07
	≥ 13 +	2	1.9	
Farm size (ha)	0.5 – 1.5	46	42.6	
	1.5 – 2.5	26	24.1	
	2.5 – 3.5	1	0.9	
	3.5+	5	4.6	1.0ha
Total		108	100	
Source: Field survey, 2015				

3.2   Effects of Yam Production on Economic Status of Respondents

3.2.1   Income of respondents and yam production

The results presented in Table 2(a) showed that yam production has contributed significantly towards the improvement of the income of the respondents. Without income from yam production, 50% of the respondents had income less than ₦400,000. Table 2(b) also shows that the per capita income without yam production was ₦467, 092. This is below the poverty line of ₦582,731 per annum. But with yam production, per capita income increased with majority (71%) of the respondents having income above the poverty line. Per capita income with yam production was N817, 314. Yam production alone contributed 49% to the income of the respondents. This shows that yam production is a vital enterprise in poverty reduction, agreeing with FMANR (1997) that famine hardly existed where yam was produced. In what follows, the increase income with yam-production was tested ($p < 0.05$) and found to be significant.

Finally, Table 2 showed that there is correlation ($r = 0.106$) between income from yam production and income from other productive activities. This explains that there is a relationship between income from yam production and income from other productive activities, this is because the income with yam production changes slightly with an increase in income from other productive activities; the weak correlation could be adduced to the fact that expenses to cater for dependents among the households is eating up the income from other productive activities, reducing the amount invested into yam production, thereby reducing income from yam production.

TABLE 2(A)
RESPONDENTS DISTRIBUTION OF INCOME

Income with yam production			Income without yam production	
Income (₦)	Frequency	%	Frequency	%
≤ 100,000	29	26.9	15	13.9
100,001 – 200,000	17	15.7	9	8.3
200,001 – 300,000	9	8.3	17	15.7
300,001 – 400,000	8	7.4	13	12.0
400,001 – 500,000	15	13.9	7	6.5
500,001 – 600,000	13	12.0	15	13.9
≥ 600,000	17	15.7	32	29.6
Total	108	100.0	108	100
Source: field survey, 2015				

TABLE 2 (B)
DIFFERENCES IN INCOME WITH YAM PRODUCTION AND INCOME WITHOUT YAM PRODUCTION

	Mean	%	Difference	T-value	Decision
Income without yam prd.	467,092	36.37	350,222	4.393	Significant
Income with yam production	817,314	62.63			
Source: field survey, 2015					

3.2.2   Poverty Status of Respondents and Yam Production

Table 3 shows the poverty status of the respondents and the effect of yam-production on the reduction of their level of poverty. The results from the study showed that without income from yam production, 68.5% of the respondent were poor leaving just 31.5% to be non-poor. But with income from yam production, there was a huge reduction in their poverty status of the respondents with 71% being majority living above poverty line. There was a reduction in the population of the poor

from 68.5% to 29%. This improvement was significant (at 5% level) as shown in the Table 3. The significant improvement due to yam-production showed that poverty had been alleviated to a great degree.

Yam has the potential of further reducing poverty being experienced by the respondents if enabling environment is created and farmers are empowered to boost their production. This is because the net income from yam contribution to the total income of the respondents was from low farm size of one hectare as against a high farm size such as 4.0ha reported by Pius and Ndjuwederie (2006). If farmers are empowered to double their farm size, the level of poverty will be reduced. This is not in variance with Okunmadewa (2002) who observed that yam production as agricultural activity in Nigeria contributed in no small way to the alleviation of poverty and still has the potential of inducing high reduction in the poverty level of farmers in Nigeria as a whole.

TABLE 3
POVERTY STATUS OF RESPONDENTS WITH AND WITHOUT YAM PRODUCTION

Poverty status	without yam production		with yam production		% difference
	Freq.	%	Freq.	%	
Poor income < ₦582,731	74	68.5	31	29	39.5
Non-poor > ₦582,731.59	34	31.5	77	71	
Total	108	100	108	100	
Source: Field survey, 2015			Paired Sample Correlation = 106		

3.2.3   Assessment of Other Benefits Derived From Yam Production

Besides the income contribution of yam production to the economic status of the respondents, the study identified other benefits derived by farmers from yam – production. Based on the perception of the respondents (Table 4) 5 out of 9 benefits under consideration were significant (mean ≥ 3.00). the most significant benefits was the absence of hunger in the households (mean = 4.42), confirming the findings of FMANR (1997); that famine hardly existed in areas were yam was produced. This suggests that the problem of food insecurity in Nigeria can be minimized by boosting yam production. Other significant benefits were; ability to train children in school, payment of hospital bills and ability to pay house rent. These results further confirmed that yam production has significantly alleviated poverty hitherto experienced by yam farmers

TABLE 4
RESPONDENTS PERCEIVED BENEFITS FROM YAM PRODUCTION

Perceived Benefits	Mean	S.D
1. There is hardly hunger in my household	4.42*	0.81
2. Afford better medical services	4.26*	0.82
3. Training of children in schools	4.07*	0.89
4. Payment of house rent	3.44*	1.27
5. Increased number of electronics and other gadgets	3.12*	1.20
6. Purchase of vehicle(s)	2.90	1.21
7. Build personal house	2.82	1.35
8. Established more businesses	2.31	0.94
9. Relocation to better accommodation	2.04	0.92

Source: field survey, 2015   M ($\bar{x}$) ≥ 3.00
                                                                                                        * = significant

3.2.4   Determinants of Poverty among Yam Farmers

Table 5 shows the factors influencing the poverty status of the respondents as obtained from the logit regression analysis. According to the table, 70% of the variation in the poverty status of the respondents was accounted for by the variation in the

explanatory variables under consideration. The significance of the Chi square (P < 0.05) showed that the model used was of good fit. This result comes close to the 72° coefficient of determination of poverty reported by Njokuoma and Ogbe (2010).

The sign of the coefficients of explanatory variables showed that age and household size negatively influenced the poverty status of respondents and were not significant. The negative influence of household size indicate that the higher the household size the higher the poverty level of respondents in that area and vice versa. The higher the household size, the higher the number of dependents to take care of and consequently the lower the money left for other expenses. Also, the higher the age of respondents, the higher the poverty level. This may be because at an old age, respondents loose the strength to farm or do any vigorous productive activity.

Education and farming-experience had positive influence but were not significant. Farm size, yam income and other income had positive and significant influence on the poverty level of respondents. This means that the higher the farm size, yam income arid other income, the lower the poverty level of the respondents.

The odd ratio showed that respondents with smaller household size were 0.02 times more likely to be non-poor than those with larger household size. This may be due to the fact that majority of the household members might be dependents who contribute less to the farm production but were catered for by the family, indicating that there is an increase in population but low food production.

Farm size, yam income and other income positively correlated with the probability of respondents to be non-poor. The odd ratios showed that respondents with higher farm size, higher income from yam production and higher income from other productive activities were 2.8,15.4 and 14 times more likely to be non-poor than those with lower farm size, lower income from yam production and lower income from other productive activities respectively. This means that any policy for the empowerment of farmer- should expand their production base and increase their income as this will help to alleviate poverty.

TABLE 5
RELATIONSHIP BETWEEN RESPONDENTS SOCIO-ECONOMIC CHARACTERISTICS AND POVERTY LEVEL (LOGIT REGRESSION)

Parameter	B	Std. Error	t value	Odd ratio
(Intercept)	2.596	4.956		13.410
Age	-7.118	1.858	-3.831	0.001
Household size	-3.922	1.880	-2.087	0.020
Education	0.562	4.522	0.124	1.754
Farm experience	0.096	8.365	0.011	1.101
Farm size	1.936*	0.934	0.612*	2.818
Yam income	2.732*	1.091	2.504*	15.364
Other income	2.641*	1.038	2.543*	14.027

Log Likelihood ratio = 129.487; df = 7; p<0.050
Goodness-of-fit test (chi-squure = 0.200; df = 100; p<0.050
Coefficient of determination^ 0.698 (69.8%)
*Significant at 5%
Source; Field survey, 2015

IV.   CONCLUSION

It has been established that yam production significantly improved the living standard of the farmers and that more improvement might have been achieved if the farmers had expanded their production base. It is therefore concluded that yam production is an important tool for poverty alleviation in Kabba/Bunu Local Government Area.

RECOMMENDATIONS

1. Since the population of yam farmers were ageing and the proportion of full-time farmers was low, government should intensify effort to empower the youth in the rural area for farming, programmes like farm settlement scheme should be

revitalized and given attention. Farming should be made appealing to the youths through provision of credit facilities and subsidies on farm input. This will encourage them to be interested in agriculture.

2. Since farm size had a positive and significant influence on poverty status of farmers, farmers can come together to form co-operatives society which can empower them with fund to increase their farm size and also embark on large scale commercial yam production.

3. The higher the household size, the higher the poverty level. Thus, farmers should be sensitized on the appropriate family planning methods to reduce over population and poverty.

4. Government should make available off-farm jobs as they have significant effects on poverty alleviation since farming has its slack and peak farming season. Job should be given to farmers during the slack periods to provide them with fund.

REFERENCES

[1] Abiola, A.G. and Alapa, O.R. (2008). Economic Development and Democratic Sustenance in Nigeria. In E.D. Ojo (ed). Challenges of Sustainable Democracy in Nigeria pp 25 – 34, Ibadan. John Archers Publishers Limited.

[2] Ardrich, J.H. and Nelson F.D. (1984). *Linear Probability, Logit and Probit Models* sage Publication, inc Newsburg Park, London, pp 48 – 65.

[3] Anyawu, J.D. (1997). Poverty in Nigeria "Concept, Measurement and Determinants i: Obaseki P.J. (Eds). Poverty Alleviation in Nigeria. *Proceedings of Nigeria, Economic Society Annual Conference*, 1997.

[4] Ekong, E. (2003). Rural Sociology: An Introduction to the Analysis of Rural Nigeria. Dove Educational Publishers, Ugo, pp32.

[5] FMANR, (1997). Nigeria Agricultural Statistics. Development of Planning Research and Statistics, Abuja, Nigeria.

[6] Foster, Greers and Thorbecke, E. (1984). "A Class of Decomposable Poverty Measures" *Econometrical* pp 761 – 766

[7] Ibitoye, S.J and Onimisi, J.A. (2013). Economic Assessment of Yam Production in Kabba/Bunu Local Government Areas of Kogi State. *Journal of Development and Agricultural Economics* Vol. 5(11). Pp 470 – 475, November, 2013.

[8] Izekor, O.B. and Olumese, M.I. (2010). Determinants of yam production and profitability in Edo State, Nigeria. *Afro Journal General Agric*/2227.pdf

[9] Njokuoma, C.E.and Ogbe, S.E. (2010). Poverty, Rural Livelihood Activities and Income among Small holder farmers under the national Special Programme on food security in Abia State. *Proceedings of 11th annual conference of NAAE* held at Federal University of Technology, Mina, pp 94 – 97.

[10] Ogunlola, V.B., Ogungbile, A.O. (2006). Alleviating Rural Poverty in Nigeria. A challenge for the National Agricultural Research System.

[11] Okumadewa, F. (2002). Poverty Reduction and Agricultural Sector. Elshaddai global Ventures ltd, Benin, pp 12, 112, 176.

[12] Onyido, I. (2000). Poverty alleviation: Agenda for food security. University of Agriculture; Makurdi, Nigeria.

[13] Pius, C.I. and Odjuvwederhie, E.I. (2006). Determinants of Yam Production and Economic efficiency among Small Holder Farmers in South Eastern Nigeria, *Journal of Central European Agriculture* 1(2): 337 – 342.

[14] Sanginga, W. (2012). Project on Yam Improvement for Income and Food Security in West Africa (YIIFSWA). IITA Ibadan April, 2012. P. 5

[15] Shringal, B.N. (2000). Macro Economic Theory Pencyion Publishers Delhi pp 64 – 78.

[16] United Nation Development Programmes UNDP, (2014). Human Development Report, Oxford University Press, Oxford London.

[17] World Bank, (2000). Attacking Poverty, World Development Report. New York Oxford University Press.

[18] World Bank (2002). Poverty and Ethnicity. A cross Country study of Roma Poverty in Central Europe, Washington DC, the World Bank.

[19] World Bank (2004). Making Services Work for the Poor People. World Development Report overview, Washington D.C. the World Bank.