



ASSESSMENT OF POVERTY STATUS AMONG RICE FARMERS IN GUMA LOCAL GOVERNMENT AREA OF BENUE STATE

Cyprian Clement Abur

Economic Policy Research Department,
P.M.B 5, U.I, Nigerian Institute of Social and Economic Research (NISER)
Ibadan, Oyo State

Abstract

The study assesses poverty status among rice farmers in Guma Local Government Area of Benue state; Nigeria. Poverty continues to be a major problem in Benue state. The study uses the simple percentage, Gini coefficient, Foster Greer Thorbecke and Bivariate logit regression techniques applied on a cross-sectional data of 95 rice farmers in the study area. to analyze data. The result of the simple percentage, show that the majority of the farmers are aged 40-50. While the result of the Gini coefficient shows 0.04 which indicates a low income inequality among the rice farmers. The result of the Foster Greer Thorbecke shows that 60 per cent of rice farmers are below the poverty line. The results of the Bivariate logit regression techniques shows the likelihood of a rice farmer being poor is reduced with increase in the number of years of formal education, output per month and the income from rice and capital. The study concluded that there is a high level of poverty among the rice farmers in the study area. However, it recommended that increased government support through the provision of subsidy on major rice equipment and the provision of production credit through public-private arrangement would go a long way to alleviate poverty among rice farmers in the area.

Keywords: Poverty, Status, Rice Farmers, Logit.

Introduction

Poverty is one of the intractable problems facing mankind. This challenge is more severe in developing countries such as Nigeria. Poverty in Nigeria is largely rural in nature as majority of the poor live in rural areas. This portion of the population depends on agriculture for a living. Other studies (Okunmadewa, 1997 and FOS, 1999) have revealed that majority of the rural people are farmers, of which rice farmers are a subset.

Ravallion (1994) saw poverty, as a lack of command over basic consumption needs i.e. the situation of inadequate level of consumption; giving rise to insufficient food, clothing and shelter. While, Ghosh (1990) viewed poverty from the perspective of moneylessness and powerlessness, moneylessness means insufficient of cash and chronic inadequacy of resources of all types to satisfy basic human needs such as nutrition, warmth, rest and body care. Powerlessness on the other hand means lack of opportunities and choice to govern oneself. According to Noah, Gafar and Muftan (2009), the importance of the measurement of poverty is to know; who is poor, how many people are poor and where the poor are located.

Foster et al (1984) opined that, the most frequently used measurements are: (i) the headcount poverty index given by the percentage of the population less than the poverty line. (ii) Poverty gap index which reflects the depth of poverty by taking into account how far the average poor person's income is from the poverty line; and the distributionally sensitive measures of squared poverty gap defined as the mean of the squared proportionate poverty gap which reflects the severity of poverty. However, they see poverty as a state of involuntary deprivation to which a person, household, community or nation can be subjected.

The distinguishing characteristic of rice farming is the use of poor yielding inputs, such as seed, pesticides and fertilizer and rudimentary technologies. Consequently, yields are generally low. The subsector also suffers from enormous post-harvest losses which are estimated at 35 to 40 per cent of landed weight (Tobor, 1985). These losses have a profound adverse impact on the rice farmers whose status and income often depend on post-harvest activities. Again, rice farmers get very little returns for their efforts due to the existence of middlemen, poaching and predation. Hence, there are low returns in terms of farm income to them. This contributes to some level of poverty among farmers. Such poverty is exacerbated by governments' policies which often concentrate resources in the modern large-scale commercial farming while small-scale farming find it difficult to obtain credit, extension services, marketing assistance and similar aid from development programmes. About four thousand people are currently engaged either directly or indirectly in rice farming and rice-based industries as producers, processors and distributors in Benue State (Abur and Torruam, 2012)

For food security to be attended there must be an understanding of poverty as a necessary precondition towards increasing agricultural production in the rural areas. The knowledge of poverty and how it relates to living standard is a logical basis for planning towards reducing poverty in the economy. This is so as poverty incidence impacts negatively on the ability of the individual to be productive. Thus, the objectives of this study is to ascertain the socio economic characteristics of rice farmers, determine the profitability of rice production, poverty status among rice farmers, examine extent to which rice production has impacted on poverty reduction and identify problems that militate against rice production in the study area. The study is significant because it coincides with the period when there is renewed efforts by the government at encouraging a private sector driven economy as outlined in vision 20:2020. Thus, the study would reveal investment opportunities in rice production that would attract more farmers' participation thereby creating jobs and improving the quality of life of the people. This work is, therefore, organized under the following sub headings: the introduction; theoretical framework and empirical review; methodology; result and discussion; conclusion and recommendation.

Theoretical Framework and Empirical Review

This research has its theoretical underpinning from situational constraints theory of poverty, the theory stipulates that poverty results from imposed constraints such as low income, unemployment and illness (Lipton, (1993); Haralambos and Heald 1980). This is because people are poor due to the fact that they find themselves in a situation of inadequate capital resource and opportunities for them to advance their welfare. It lays emphasis on the structural conditions that lead to poverty and at the same time focuses on the individual response to the objective situation of poverty. This theory underpins the establishment of the Bank of Agriculture where school leavers or farmers who are unemployed can be given loans to invest in food production that would create jobs and improving the quality of life of the people through public-private sector driven economy as outlined in vision 20:2020.

The use of Gini coefficient, Foster Greer Thorbecke and logit regression analysis in the study of poverty in Nigeria is a recent development. Several empirical applications have followed the Gini coefficient, Foster Greer Thorbecke and logit regression. These include; Keshiro (2004) research on poverty status among farmers in Lagos state, Nigeria; Nigeria. Poverty continues to be a major problem in Lagos state. The study uses the simple percentage, Gini coefficient, Foster Greer Thorbecke and Bivariate logit regression techniques to analyze data. The result The Gini coefficient shows a low income inequality among the farmers. The result of the Foster Greer Thorbecke shows that 60 per cent of farmers are below the poverty line. The results of the Bivariate logit regression techniques shows the likelihood of a farmer being poor is reduced with increase in the number of years of formal education, output per month and the income from and capital. The study concluded that there is a high level of poverty among the farmers in the study area

Jibril, Haruna and Okonu, (2009), assess poverty level among Farmers in Bauchi Local Government Area. The study used both primary and secondary data in achieving the set objective; stratified random sampling technique was used to select three hundred and fifty respondents in the study area. Descriptive statistical tools and logit regression were used to analyse the data. The result shows that a change in the number of meals taken per day from farm income, access to improved medical services and level of education of the farmers will lead to about 24.4%, 42.4%, 34%, 51.7% and 12% reduction in their log likelihood of being poor. It was recommended that enabling environment be created by the government for farmer to operate favourably with a view of alleviating agricultural poverty.

Abur and Torruam (2012) investigate agricultural credit as a strategy for poverty reduction in Benue state, Nigeria. Primary data were used and applied on a cross-sectional data of 274 respondents in 2012. The analytical tools include descriptive statistics and logit regression model. The result from logit regression techniques, indicates that the computed value of Nagelkerke R^2 is as high as 0.723, this implies that agricultural credit influence the poverty status of the respondents. The study concluded that, agricultural credit has help in reducing poverty among the respondents.

Methodology

This study was conducted in five communities of Guma Local Government Area of Benue state, Nigeria. The wards are purposively selected because of the prevalence of rice production in the study area. The wards include Mbabum, Gbayange, Mbayer, Mbakijime and Mbapupuu. The second stage involved a simple random selection of 19 farmers from each of the five wards. Thus, making a total of 95 sampled rice farmers in the study area. For this study, farmer with 0.1 to less than 2.0 hectares of farm land was considered as small scale farmers while those with farmland of 2 to less than 5.0 hectares and 5 hectares and above, was considered as medium and large scale farmers respectively.

The study used primary data based on 2012 farming season. Primary data were collected with the use of a structural questionnaire to collect input-output data of the farmers defined within economies of scale. Data were collected through the use of a structured questionnaire administered to rice farmers in the study areas. The questionnaires were given to educated farmers to fill while uneducated ones were interviewed orally. Two methods were used to analyze the data collected. These are: firstly, descriptive statistics consisting of bar charts, simple percentages and proportion which is used to examine the data collected. Secondly, the study employed logistic model to assess poverty occurrence among rice farmers in the area. The logistic regression model is represented as follows:

$$\ln(P/1 - P) = Z = \alpha + \beta_1 X_1 + \mu_1 + \dots + \mu_i$$

Z = the probability, which measures the total contribution of the independent variables in the model and is dependent variable (poverty status), known as logit and is calculated as:

$$Z = \frac{\text{Average Annual income of Household from farming activities}}{\text{Total number of days in a year (365 days)}}$$

If the result (poverty status) is less than \$1.5 dollars naira equivalent, it means that the household is poor as such they were assign (1). But if the result (poverty status) is \$1.5 dollars and above it naira equivalent, it means that the household is non-poor; in this case (0) were assign. Assuming that \$1.5 dollars naira equivalent is (₦225) that is, \$1: ₦150. α = constant; Where β_i is a vector of parameters that relate the explanatory variable X_i to the probability that the variables for the logit analysis are: Y = Poverty status as determined in FGT analysis which is 1 if poor and 0 if non-poor; X_1 = Yield per month in kilogrammes; X_2 = Number of years of formal education of household head; X_3 = Income from rice activities in naira; X_4 = Capital (cost of initial capital) requirement in naira; X_5 = Business age/experience in years; X_6 = Child dependency ratio; X_7 = Use of Farm loan where Yes =1 and 0 otherwise.

A positive β mean that X increases the probability of the outcome; a negative β mean that X decreases the probability; a large β means that the factors strongly influence the probability; while a near zero means that the X has little influences on Z (poverty).

Decision rule

To test the hypothesis that all the slope coefficients are not simultaneously equal to zero, if the Likelihood Ratio (LR) is greater than the probability (P) value, the null hypothesis is rejected and the alternative accepted. If the LR is smaller than the P value, the null hypothesis was accepted and the alternative rejected. Finally, the Nagelkerke R^2 was used to measure how much the explanatory variables in the model contribute to Z. Poverty was measured using FGT

Index (Foster, Greer and Thorbecke, 1984). Poverty status was measured using Headcount Ratio and Poverty Gap measures. The Headcount Ratio is expressed as:

$$H = Q/N \dots\dots\dots ii$$

Where, H = Headcount ratio with values ranging from 0 to 1. The closer the value to 1, means the higher the proportion of people below the poverty line. Q = Number of households below the poverty line. N = Total number of household in the studied population. The poverty gap is measured as follows:

$$P_{\alpha} = 1/n \sum \frac{(Z - Y_i)}{Z} \dots\dots\dots iii$$

Where, P_{α} = Poverty gap, Z = Poverty line, Y_i = Income of the i^{th} household in poor population, α = The FGT parameter with values from 0, 1, and 2. n = Total numbers of population studied, α represent less than or equal to 1 for each. That is $\alpha \geq 0$. If $\alpha = 0$, then P_0 is simply the Headcount Ratio which is also called incidence of poverty and if $\alpha = 1$, P_1 is renormalization of the income – gap measure which is also refer to as poverty gap. Finally, the sensitive measure P_2 is obtained by setting $\alpha = 2$ and is called severity of poverty. Finally, the research arguments Gini coefficient to measure income distribution among the population; The Gini coefficient can be calculated using the method below:

$$G = \frac{N+1}{N-1} - \frac{2}{N(N-1)u} (\sum_{i=1}^N P_i X_i) \dots\dots\dots iv$$

Where u is the mean income of the population, P_i is the income rank of P of individual i, with income X, such that the richest individual receives a rank of 1 and the poorest a rank of N, this effectively gives higher weight to poorer people in the income distribution, which allows the Gini to meet the transfer formula.

Results and Discussion

The socioeconomic characteristics of the respondents reveal that the rice farmers’ ages range between thirty to fifty years while 61 per cent of them fall within the range of 41 and 50 years. By implication, they have high likelihood to earn higher incomes as they are at the peak of their active years. Rice farming is male dominated, with 75 per cent of the respondents being men. This may not be unconnected with the exertion of physical energy required in farming. About 82 per cent of the rice farmers are married while 62 per cent have household size of between 4 to 6 members. Much of their income would be expended on responsibilities associated with their large family sizes, which may increase the likelihood of the respondents being poor. The rice farmers are literate, with 53 per cent of them having attended secondary school. Their income level shows that, on the average, 17 per cent of the respondents earn between ₦21000 and ₦36000 per day while 26 percent only earn between ₦53000 and ₦69000 per day.

Table 1: Socioeconomic Characteristics of the Respondents

Socioeconomic Characteristic	Frequency	Percentage
Age in years		
30 and below	1	1.05
31-40	36	37.89
41-50	58	61.05
Sex of Respondents		
Male	71	74.74
Female	24	25.26
Marital Status of Respondents		
Married	78	82.11
Not married	17	17.89
Educational Level of Respondents		
None	27	28.42
Primary	16	16.84
Secondary	39	41.05
Tertiary	13	11.57
Household Size of Respondents		
1-3	36	37.89
4-6	59	62.11
Income from Farming Activities in Naira		
₦50000-₦20000	3	2.11
₦21000- ₦36000	16	16.84
₦37000 - ₦52000	19	20.00
₦53000 - ₦69000	25	26.32
More than ₦ 70000	32	33.68
Years of Fishing Experience		
Less than 10	15	15.78
10-20	80	84.2
Sources of Credit		
Cooperatives	60	63.16
Money lenders	2	2.11
Personal funds	33	34.74
Total	95	100

Source: Computed from Survey Data, 2014.

Comparing these incomes with the household sizes of the respondents, they are likely to be prone to poverty. None of the respondents had access to bank credit; about 63 per cent sourced credit from cooperatives and 35 per cent sourced from personal savings and 2 per cent sourced from Money lenders. This finding corroborates Ikotun’s (2002) work in Oyo State where only 5 per cent of the sampled rice farmers had access to bank credit while 73.2 percent used personal

savings. This may be the outcome of their low level of income and poor record keeping, as they would not be bold to approach banks for loans, being poor and not having collateral and proper documentation of their business activities. Table 2 indicates that, the total hectares of land cultivated by farmers in the study area were 435.6, 237.06 and 44.22 hectares and their averages are 1.1, 3 and 5.9 ha for small, medium and large scale respectively. This indicates that, the size of land owned and cultivated by a farmer in the study area determines to a large extent the farmers' level of output (*ceteris paribus*).

Table 2: Farm size Distribution of Rice Farmers.

Farm size	No of farmers of land	Total Hectares Hectares	Range in Farm Size	Average
Small scale	70	435.6	0.4 - 1.8	1.1
Medium scale	30	237.06	2.0 - 4.0	3.0
Large scale	20	88.22	5 - 7.2	5.9
Total	100	760.34	7.4 - 13.0	100

Source: Field Survey, 2014

Measurement of Rice Profitability

Table 3 demonstrates the mean average total variable cost of producing rice in the sample area is ₦11, 545 per hectare. The gross margin obtained for producing rice in the sample area is ₦21,095. The return on gross margin, which is a measure of financial success or failure for producing rice is ₦2, indicating that on the average, a gross margin of ₦2 for each naira spent on rice production. This indicates that rice production is profitable in the study areas and all things being equal.

Table 3: Average Costs and Returns per Hectare

Variable description	(₦)Mean
Total Variable Cost	₦11, 545
Average yield Per month	₦ 32,640
Gross Margin = Average yield Per month - Total Variable Cost	₦21,095
Return on Gross Margin = Gross Margin ÷ Total Variable Cost	₦2

Source: Field Survey, 2014

Average Annual Income of Rice Farmers

The income level of moderate poor rice farmers fall below the poverty line of ₦153576. 64 by 23 % amounting to ₦3,532,262.72 annually in addition to their income in order to be non- poor as it is shown in table 4. Similarly, for core poor, their income was 26% below the poverty line of ₦76788. 32; this means that a core – poor rice farmers needed about 26% of ₦76788.32 representing ₦19, 964. 96 annually in addition to their income in order to be moderately poor. That is ₦19, 964. 96 are needed annually in addition to a rice farmer average annual income to move from one poverty status to another.

Table 4: Average Annual Income of Rice Farmers

Distribution of Responses	Amount of income
Total Average annual income	₦ 63, 120, 000
Mean Average annual income	₦ 230, 36 4.96
2/ 3 of the mean income	₦ 153576. 64
1/ 3 of the mean income	₦ 76788. 32
<i>poverty gap index</i>	
Moderate poor	0.23
Core poor	0.26

Source: field survey, 2014.

Analysis for Poverty Status

Result of the estimates on poverty in table 5 shows that 60 per cent of rice farmers are below the poverty line. The most poverty-susceptible group of respondents is the rice farmers aged between 41-50 years of age exhibiting 63 per cent poverty incidence. The poverty line adopted for this study is ₦ 5 544.40 per month. This was obtained by finding two-thirds of the mean household expenditure value for the survey respondents. Age group 31-40 years follows with 52 per cent poverty incidence. The values P₁ and P₂ confirm the poverty status among these age groups. This high incidence can be ascribed to large families kept by the respondents. The age group 31-40 (young family heads) years is the least affected by poverty with an incidence of 60 per cent.

Table 5 shows that female-headed households have higher poverty incidence than male-headed households, which could be due to women having reduced access to credit and sundry production resources. This is a pointer to the existence of gender inequality among the rice farmers. Poverty is higher among the married respondents having over 62 per cent poverty incidence. Majority of the married respondents are living below the poverty line due to the pressure of family expenses on respondents' income. About 28 per cent of the rice farmers that have no education exhibit 66 per cent poverty incidence while those with 6–12 years of formal education have 46 per cent poverty incidence. Poverty depth and severity are least for this group. The implications of this reflect on the importance of human capital development to poverty alleviation efforts in Nigeria. The table also shows that households with 1-3 members are not seriously affected by poverty. Poverty incidence for the group is 47 per cent while incidence for households with 4-6 members is 68 per cent with high poverty depth and severity.

Table 5: Poverty Status among Rice Farmers

Socioeconomic Characteristics	Response	Incidence (Po)	Depth (Pi)	Severity (P ₂)	Head Count
Age	< 30	1.000	0.125	0.016	1
	31-40	0.528	0.120	0.034	36
	41-50	0.638	0.172	0.062	58
Sex	Male	0.521	0.119	0.039	71
	Female	0.833	0.247	0.086	24
Marital Status	Single	0.471	0.090	0.022	17
	Married	0.628	0.165	0.058	78
Education	None	0.667	0.213	0.083	27
	3-6	0.813	0.221	0.079	16
	6-12	0.462	0.084	0.020	39
	13-18	0.615	0.140	0.045	13
Household Size	1-3	0.472	0.096	0.026	36
	4-6	0.678	0.185	0.066	59

Gini Coefficient 0.04

Source: Computed from Survey Data, 2014

The Gini coefficient of the respondents is 0.04 which shows a low income inequality of 0.04 among the rice farmers. This suggests that the income of the respondents do not significantly diverge from one another. This is in line with the findings of Llori (2009), which revealed that reducing inequality has a larger positive impact on poverty. This may translate into more sustainable livelihood or poverty reduction in the rice sub-sector.

Logit Regression Analysis

In table 6, the overall model for rice farmers is significant at one per cent. The pseudo R-square depicts that 74 per cent of the variable affect their poverty level. The significant determinants of poverty among rice farmers are the number of years of formal education, output per month and the income from rice and capital. The likelihood of a rice farmer being poor is reduced with increase in the number of years of formal education, yield per month and the income from rice and capital.

Table 6: Logit Estimates of the Determinants of Poverty Status among Rice Farmers in the Study Area.

Variable	Coefficient	Standard Error	T-Values
Yeild per month	-3.0143	4.8189	-0.626
Years of Education	-0.0053***	0.0020	-2.716
Income from rice	-1.9037***	0.5426	-3.508
Capital	-0.4399***	0.9338	-0.471
Years of Experience	-0.6250	0.3682	-1.697
Dependency Ratio	-0.4144	0.8339	-0.501
Farm loan	3.028	3.0145	1.005

LR Chi Square = 8333*** Pseudo R Square = 0.7370

*Source: Computed from Survey Data, 2013 ***Significant at the 1 per cent level.*

The Farm loan of the respondents has a positive relationship (3.028) with the poverty status but it is not statistically significant. This implies that a unit increase in the Farm loan will lead to about 10% increase in the log likelihood of the respondents being poor. Finally, dependency Ratio of the respondents has a negative relationship (-0.4144) with the poverty status but it is statistically significant. This implies that a reduction in the dependency ration will lead to about 50% reduction in the log likelihood of the respondents being poor.

Problems confronting Rice Production

One of the greatest problems confronting rice production in the study area is inadequate fund. Most farmers in the study area are poor and cannot afford to buy some of the farming inputs, as 42% of the respondents attest to it in table 7. Other problems such as pest and diseases, flood, inadequate rain or water problems, transportation problems, social infrastructural facilities etc. represents 31.5% opined that these problems affects rice production adversely in the study area. Also, closely related to this, is the fact that inputs are too expensive for an ordinary farmer in the study area considering farmers' financial status as 16% of the respondents attest to it. Government policies that favour rice importation at the expense of domestic production had serious adverse effect on rice production in the study area as signified by 10.5% of the respondents in table 7. This is because; it reduced demand for local rice. This discouraged the rice producers in the study area.

Table 7: Major Problems encountered in Rice Production

Problems	No. of Respondents	Percentage
Inadequate funds	40	42
High Cost of Input	30	16
Poor Govt. Policy	10	10.5
Others (diseases, rain, Soc. Facilities, climate etc)	15	31.5
Total	95	100

Source: Field survey 2014.

Conclusion

This study assesses poverty status among rice farmers in Guma LGA of Benue State. The study reveals that there is a high level of poverty in the study area among the rice farmers in the area. Inadequate funds and high cost of input as well as government policies were found to be important factors that should be addressed in rice production to reducing poverty in the sampled areas.

Recommendation

The study recommended that there is need to increase the income of the respondents by increasing government support for the rice sub-sector in the state through the provision of subsidy on major equipment used by the respondents. Poverty alleviation packages for the rice farmers should also include provision of credit facilities for the respondents. The facilitation of this would be best implemented through public-private arrangement this would go a long way to alleviate poverty among rice farmers in the area.

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