

Poverty and Income among the Smallholder Farmers in Nigeria

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ABSTRACT The study examined the relationship between poverty and income among the smallholder farmers in Nigeria using 393 smallholder farmers in Benue State. The result of the study showed that the bottom 10 percent of the population (the poorest households) receives only 1.72 percent of the total income, while the top 10 percent of the population (the richest households) receives about 50 percent of the total income. Furthermore, per capita income is most strongly related to poverty reduction among the respondents, suggesting that improvement in per capita income among the respondents may be more critical for reducing poverty among the respondents in Nigeria. Per capita income is more strongly correlated with farm income than non-farm income among the respondents, implying that improvement in farm income – and equitable distribution of income – among the respondents may be more critical for improving the welfare of the entire household members of the respondents and hence poverty reduction in Nigeria.

INTRODUCTION

The link between poverty status and poverty reduction among the farming households is indirect through the relationship between productivity, income growth and poverty (Norman 1975; Ajibefun 2000; Ajibefun 2002; Ater 2003; Ajibefun and Daramola 2003; Amalu 2005). Bigsten et al. (2003), Federal Republic of Nigeria (2005), Amalu (2005) and Federal Republic of Nigeria (2007) argued that in order to reduce poverty, it is fundamental that economic policies should aim at promoting rapid economic growth. Furthermore, many authors believe that an effective approach towards more comprehensive poverty reduction is to enhance economic growth (Dollar and Kraay 2002; Ravallion 2001). However, there is general agreement in the literature that growth is necessary but not sufficient for poverty reduction (Ravallion and Datt 2002; Hoekman et al. 2001). Others argued that growth in incomes of the poor is strongly correlated with overall growth of the economy especially growth in the

agricultural sector, and this fact has been demonstrated in cross-country and individual country studies (Hoekman et al. 2001).

Chirwa (2005), therefore, argued that macro-economic policies that promote growth in income are likely to lead into poverty reduction. For instance, with respect to agriculture, changes in price will provide incentives for agricultural production and specialization, which in turn may lead into growth and distribution of income through employment generation and revenue enhancement, and consequently poverty reduction (Chirwa 2005). Similarly, at the micro level, enterprises that promote income growth and distribution and enhance the revenue of the poor households are most likely to lead into poverty reduction among the poor households. For instance, improvement in farmers' productivity and output would lead to income growth (all things being equal) and consequently poverty reduction (Norman 1975; Ajibefun 2000; Ajibefun 2002; Ajibefun and Daramola 2003; Ater 2003).

Amalu (2005) pointed out that poverty is not only about income, but also about access to all basic needs. For this reason, simply growing more food will not reduce poverty. In considering the issue of poverty reduction and agriculture, agriculture should be seen simply as a means to an end, not end itself. In devising agricultural sector strategies for poverty alleviation in Nigeria, a combination of income growth with

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poverty reduction strategies could be most beneficial but only if the wealth created by growth is channeled appropriately (Amalu 2005).

There is the view that rural income benefited noticeably from policies introduced during the SAP years (Aigbokhan 2000). For example, Obadan (1994) noted that major agricultural export crop commodities producers, notably of rubbers, experienced growth in income following naira exchange rate devaluations. Similarly, Canagarajah et al. (1997) reported that between 1985 and 1993, terms of trade turned in favour of the rural sector, so that the urban-rural income narrowed substantially. The implication of this is that poverty declined in the rural areas (Aigbokhan 2000). Erenstein et al. (2003) pointed out that economic growth and poverty alleviation in Nigeria will depend to a large extent on the ability of the country to improve on her agriculture.

Like wealth, poverty is not shared equally around the world. Income like poverty is also not equally shared. There is no doubt that agricultural growth is a catalyst for broad based economic growth and development in most low-income countries and that economic growth is strongly linked to poverty reduction (Amalu 2005).

Hoekman et al. (2001) argued that for growth to have some meaningful impact on poverty, that growth must occur in sectors in which a large proportion of the poor derive their livelihood. It is worth noting that the agricultural sector remains the important sector for livelihood especially in rural Nigeria, which accounts for more than 70 percent of the population. However, Bigsten and Shimeles (2003) assert that the direction of causality of growth-income distribution-poverty relationship is still unclear in theory as well as in empirical studies.

There are a few studies that have focused on the relationship between growth in income and changes in poverty. Ravallion and Datt (2002) in a study of growth and poverty in India found that initial inequality in income, literacy, farm productivity and asset distribution affect the relationship between growth and poverty. Using Probit model on the Family Income and Expenditure Survey data from 1985 to 2000 in Philippines, Sawada and Estudillo (2006) found that both non-transfer and transfer incomes decreased poverty significantly but transfer income exerted greater impact.

There is little empirical work on the relationship between poverty and income among the smallholder farmers in Nigeria, which could serve as a policy guide for developing strategies aimed at reversing the deteriorating poverty situation. The purpose of this paper is to provide empirical evidence of the relationship between poverty and income among the smallholder farmers in Nigeria as a guide for poverty reduction policy.

Objectives of the Study

The broad objective of this study is to analyse the relationship between poverty and income among the farming households in Nigeria. The specific objectives are to:

- i. analyse the size distribution of household income among the smallholder farmers in Nigeria; and
- ii. analyse the correlation between poverty and income among the smallholder farmers in Nigeria.

In order to accomplish the objectives of this study, the following hypotheses were stated and tested:

- i. there is no significant relationship between poverty and income among the smallholder farmers in Nigeria;
- ii. there is no significant relationship between farm income and non-farm income among the smallholder farmers in Nigeria;
- iii. there is no significant relationship between farm income and per capita income among the smallholder farmers in Nigeria;
- iv. there is no significant relationship between non-farm income and per capita income among the smallholder farmers in Nigeria.

METHODOLOGY

The Study Area

For this study, farm level data were collected on 393 farmers in Benue State. Benue State is one of the 36 states of Nigeria located in the North-Central part of Nigeria. The State has 23 Local Government Areas, and its headquarters is Makurdi. Located between Longitudes 6° 35'E and 10°E and between Latitudes 6° 30'N and 8° 10'N. The State has abundant land estimated to be 5.09 million hectares. This represents 5.4 percent of the national land mass. Arable land in

the State is estimated to be 3.8 million hectares (BENKAD 1998). This State is predominantly rural with an estimated 75 percent of the population engaged in rain-fed subsistence agriculture. The state is made up of 413,159 farm families (BNARDA 1998). These farm families are mainly rural. Farming is the major occupation of Benue State indigenes. Popularly known as the "Food Basket" of the Nation, the State has a lot of land resources. For example cereal crops like rice, sorghum and millet are produced in abundance. Roots and tubers produced include yams, cassava, cocoyam and sweet potato. Oil seed crops include pigeon pea, soybeans and groundnuts, while tree crops include citrus, mango, oil palm, guava, cashew, cocoa and *Avengia spp.*

Sampling Technique

In this study, the multi-stage random sampling technique was used for sample selection. Benue State is divided into three (3) agricultural zones viz: Zone A, Zone B and Zone C. Zone A and Zone B are made up of seven local government areas each while Zone C is made up of nine local government areas. Using a constant sampling fraction of 45 percent, three local government areas were randomly selected from Zone A and Zone B while four local government areas were randomly selected from zone C under the guide of Benue ADP workers in BNARDA. From each of the selected local government areas, one rural community was randomly selected. Finally, from each community, households were randomly selected on the basis of the community's population size using a 1 percent constant sampling fraction in order to make the sampling design to be self-weighting thereby avoiding sampling bias (Eboh 2009). Based on the foregoing, 393 smallholder farmers were randomly selected for the study.

Data Collection

Data were collected mainly from primary sources. The primary data were obtained through the use of a structured questionnaire, copies of which were administered to the selected 393 smallholder farmers in Benue State.

Analytical Technique

The P-alpha measure of poverty and the Food Energy Intake (FEI) method were used for

the measurement of poverty gap among the respondents, whereas the quintiles analysis and deciles analysis were used for the analysis of size distribution of household income among the respondents (specific objective i). Correlation analysis was used to achieve the specific objective ii of the study. The hypotheses were tested using the Pearson correlation coefficients.

Model Specification

Estimation of Poverty Line

The FEI method was adopted in estimating the poverty lines for this study. This was done in two stages. The first stage was to run a regression of the cost of a basket of commodities consumed by each household in the sample over the calorie equivalent as represented in equation 1:

$$\text{Log}E = \alpha + \beta C + \varepsilon \dots \dots \dots (1)$$

where E is food expenditure and C is calorie consumption and ε is the error term.

To derive the values for the variables in this equation, the following steps were taken. First, the total value of food expenditure (E) was obtained by summing the value of consumption from own product. This was converted to its per capita value by dividing it by the household size (where the adult equivalent cannot be calculated due to absence of information on household composition). The calorie equivalent C was obtained by summing the calorie equivalent of the food items listed for each household.

The next stage was to calculate the cost of the basket by estimating equation 2:

$$Z = e^{(\alpha + R\beta)} \dots \dots \dots (2)$$

where e is natural constant (2.71829), R is the recommended daily allowance of calorie intake. This gives the food poverty line or the cost of acquiring the recommended daily allowance (RDA) of calories, which for the study is, 2,900, the minimum energy intake requirement recommended by FAO (Federal Republic of Nigeria 2005; NBS 2005).

P-alpha Poverty Measures (Foster-Greer-Thorbecke Index)

Foster et al. (1984) proposed a family of poverty indices based on a single formula capable of incorporating any degree of concern about poverty through the poverty aversion parameter α . This is the so called P-alpha measure

of poverty or the poverty gap index. The index is defined as:

$$P_{\alpha} = \frac{1}{N} \sum_{i=1}^q \frac{(z-y_i)^{\alpha}}{z} \dots\dots\dots (3)$$

where z is the poverty line, q is the number of households below the poverty line, N is the total sample population, y_i is the per capita expenditure of the i th household, and α is the Foster et al. (1984) parameter, which takes the value 0, 1 and 2, depending on the degree of concern about poverty. The quantity in parentheses is the proportionate shortfall of expenditure or income below the poverty line. By increasing the value α , the aversion to poverty as measured by the index is increased. For example, where there is no aversion to poverty $\alpha = 0$, the index is simply:

$$P_0 = \frac{1}{N} \sum_{i=1}^q 1 = \frac{q}{N} = H \dots\dots\dots (4)$$

which is equal to the head count ratio. This index measures the incidence of poverty. If the degree of aversion to poverty is increased, so that $\alpha = 1$, the index becomes:

$$P_1 = \frac{1}{N} \sum_{i=1}^q \frac{(z-y_i)}{z} = HI \dots\dots\dots (5)$$

Here the head-count ratio is multiplied by the income gap between the average poor person and the line. This index measures the depth of poverty; it is also referred to as "income gap" or "poverty gap" measure.

Linear Correlation

A product moment correlation coefficient r , can take any value between -1 and +1.

A statistically significant correlation coefficient in the range $0 < r \leq 0.3$ is regarded as weak correlation; $0.3 < r \leq 0.6$ is regarded as moderate correlation; $0.6 < r < 1$ is regarded as strong correlation, while a correlation coefficient of 1 is regarded as perfect correlation.

A positive correlation implies co-movement in the same direction. A negative correlation implies co-movement in opposite direction. Zero correlation implies a complete absence of joint linear movement.

RESULTS AND DISCUSSION

Size Distribution of Household Income

The results of quintiles and deciles analyses of the income of the households are presented

in Table 1. The first quintile represents the bottom 20 percent of the population on the income scale. This group receives only 4.42 percent of the total income of the households. The second quintile receives only 9.87 percent of the total income of the households. The bottom 40 percent of the population (quintiles 1 plus 2) is receiving only 14.29 percent of the total income of the households. The top 20 percent (the fifth quintile) of the population receives 58.72 percent of the total income of the households.

The Kuznets ratio (the ratio of the incomes received by the top 20 percent and bottom 40 percent of the population) is 4.11, suggesting that there is a high degree of inequality between high-income and low-income groups among the respondents in the study area.

To provide a more detailed breakdown of the size distribution of income, the result of the deciles (10 percent) shares analysis indicates that the bottom 10 percent of the population (the poorest households) receives only 1.72 percent of the total income, while the top 10 percent of the population (the richest households) receives about 50 percent of the total income, suggesting that just one-tenth of the households in the area controlled about half of the wealth of the area.

Table 1: Size distribution of household income by income shares - quintiles and deciles - among the respondents

	Quintiles	Deciles
1	4.42	1.72
2	9.87	2.79
3	12.19	4.58
4	14.80	5.34
5	58.72	5.76
6		6.62
7		7.00
8		7.79
9		9.79
10		48.96
Total	100	100

Source: Field Survey 2009

The implication of the foregoing results is that the top most group (the richest households) in the area receives not less than 50 percent of the total income of the area because the group probably owns and controls larger proportion of the productive and financial resources in the area. Todaro and Smith (2009) noted that the

ultimate cause of the unequal distribution of personal incomes in most developing countries is the unequal and highly concentrated patterns of asset ownership (wealth) in these countries. The principal reasons why 20 percent of their population often receives over 50 percent of the national income is that this 20 percent probably owns and controls well over 90 percent of the productive and financial resources, especially physical capital and land and also financial capital (stocks and bonds) and human capital in the form of better education and health.

Correlation Analysis of Poverty and Income

The result in Table 2 shows that the null hypothesis that there is no significant relationship between poverty gap and income among the farming households in Nigeria is rejected at 5 percent level of probability. The result also shows that there is a significant positive correlation between poverty gap and farm income among the respondents, suggesting a direct relationship between poverty gap and farm income among the respondents. This implies that as farm income increases, poverty gap increases among the respondents.

Similarly, the results further show that there is a significant positive correlation between poverty gap and non-farm income among the respondents, suggesting a direct relationship between poverty gap and non-farm income among the respondents. This implies that as non-farm income increases, poverty gap increases among the respondents.

Table 2: Correlation analysis of poverty and income among rural farmers in Nigeria

	<i>Pove- rty gap</i>	<i>Farm income</i>	<i>Non- farm inc- ome</i>	<i>Per capita income</i>
Poverty gap	1.00			
Farm income	0.095*	1.00		
Nonfarm income	0.091*	0.867**	1.00	
Per capita income	-0.079*	0.870**	0.864**	1.00

Source: Field Survey 2009

* Correlation coefficient (r) is significant at 5% level (2-tailed).

** Correlation coefficient (r) is significant at 1% level (2-tailed).

The implication of the foregoing finding is that farm income and non-farm income increase

poverty among the respondents. This is attributable to inequitable distribution of farm income and non-farm income among the respondents. Sawada and Estudillo (2006) observed that inequality tends to increase poverty. Asogwa et al. (2010) found that high degree of inequality exists in the distribution of farm income and non-farm income among the rural and peri-urban farming households in Nigeria, suggesting that income redistribution policy can lead to a considerable reduction of poverty among the respondents.

Furthermore, the results show that there is a significant negative correlation between poverty gap and per capita income among the respondents, suggesting an inverse relationship between poverty gap and per capita income among the respondents. This implies that as per capita income increases, poverty gap decreases among the respondents. The implication of the foregoing finding is that per capita income decreases poverty among the respondents. This is attributable to the fact that increase in per capita income tends to cushion the negative effect of large household size and large number of unproductive dependants (as is characteristic of typically agrarian society like Nigeria) on income and consequently poverty reduction (Asogwa 2010).

The result in Table 2 further indicates that per capita income is most strongly correlated with poverty among the respondents. This suggests that per capita income is most strongly related to poverty reduction among the respondents. The implication is that improvement in per capita income among the respondents may be more critical for reducing poverty among the respondents in Nigeria.

Furthermore, the result in Table 2 shows that the null hypothesis that there is no significant relationship between farm income and non-farm income among the respondents is rejected at 5 percent level of probability. The result shows that there is a significant positive correlation between farm income and non-farm income among the respondents, suggesting that farm income and non-farm income tend to rise or fall together among the respondents. The result further indicates that per capita income is more strongly correlated with farm income than non-farm income among the respondents. This suggests that improvement in per capita income

among the respondents resulted relatively more from improvement in farm income than non-farm income. The implication is that improvement in farm income – and equitable distribution of income – among the respondents may be more critical for improving the welfare of the entire household members of the respondents and hence poverty reduction in Nigeria.

CONCLUSION

The result of the study showed that the top most group (the richest households) in the area received not less than 50 percent of the total income of the area because the group probably owns and controls larger proportion of the productive and financial resources in the area. Furthermore, farm income and non-farm income increase poverty among the respondents due inequitable distribution of farm income and non-farm income among the respondents whereas per capita income decreases poverty among the respondents. Per capita income is most strongly related to poverty reduction among the respondents, suggesting that improvement in per capita income among the respondents may be more critical for reducing poverty among the respondents in Nigeria.

Furthermore, farm income and non-farm income tend to rise or fall together among the respondents. Per capita income is more strongly correlated with farm income than non-farm income among the respondents, implying that improvement in farm income – and equitable distribution of income – among the respondents may be more critical for improving the welfare of the entire household members of the respondents and hence poverty reduction in Nigeria.

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