

Full Length Research Paper

Determinants of rural poverty in Nigeria: Evidence from small holder farmers in South-western, Nigeria

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Small farmers are one of the more disadvantaged and vulnerable groups in Nigeria. Studies have shown that majority of people living in absolute poverty can be found on small farms with half in this group undernourished. The study examined the determinants of rural poverty in Nigeria. The study uses a Probit model on a sample of 500 smallholder farmers to establish factors that influences probability of households' escaping chronic poverty. Results show that access to micro-credit, education, participation in agricultural workshops/seminars, livestock asset, and access to extension services significantly influencing the probability of households' existing chronic poverty. On the other hand, female headed households' and distance to the market increases the probability of persistence in chronic poverty. Thus, these variables are significant in capturing the key rural poverty determinants. However, gender disparities in property rights has a consequence on poverty, as women empowerment through legal rights to property as key chronic poverty ameliorating factors among the farming communities.

Key words: Smallholder farmers, persistence chronic poverty, farming communities, Southwest, Nigeria.

INTRODUCTION

The debate on the relationship between small farms and poverty in Sub-Saharan Africa (SSA) has gone through a complete circle (Spencer, 2002; Poulton et al., 2005; Lipton, 2005). Evidence from literature and past studies have identified this region's as one of the world's poorest, and the economies are heavily depended on agriculture as the primary source of income and food. Past studies have also identified that most of the poorest households in SSA are found working in agriculture (Ikpi, 1989; Ayoola et al, 2000; Okunmadewa, 2002; Spencer, 2002; Alayande and Alayande, 2004; Poulton et al., 2005; Apata, 2006). However, these farmers play an important role for food security with an average farm size ranges between 0.7 to 2.2 hectares. Facts have also shown that while proportion of the population living in poverty in smallholder farming is on the decrease in Asia, the proportion has increased in SSA (Johannesburg Summit,

2002; Chen and Ravallion, 2004, Lipton, 2005, Apata et al., 2009).

The poverty situation in Nigeria is quite disturbing. Both the quantitative and qualitative measurements attest to the growing incidence and depth of poverty in the country (Federal Office of Statistics (FOS), 1999; Okunmadewa et al., 2005). This situation however, presents a paradox considering the vast human and physical resources that the country is endowed with. It is even more disturbing that despite the huge human and material resources that have been devoted to poverty reduction by successive governments, no noticeable success has been achieved in this direction. Although, predicted poverty reduction scenarios vary greatly depending upon the rate and nature of poverty related policies, actual evidence suggests that the depth and severity of poverty is still at its worst in Nigeria, Sub-Saharan Africa and South Asia (Hanmer and Nasehold, 2000; Barbier, 2000; Okunmadewa et al., 2005). Within these regions, poverty is largely a rural phenomenon with an average of between 62 and 75% of the population living on less than

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a dollar a day (Pinstруп-Anderson et al., 2001). Rural poverty also tends to be deeper than urban poverty in these regions (Bird et al., 2002; Apata et al., 2009). Besides, it has become increasingly evident that within the African region the poor are heterogeneous and that some element of dynamics does exist with a clear distinction between chronic and transitory poverty (Barret et al., 2000). Chronic poverty is considered the component of total poverty that is static and transitory poverty component that is attributable to the inter-temporal variability (Jalan and Ravallion, 1996). The isolation of the process underlying chronic and transitory poverty is considered essential in understanding the extent to which each poverty type may obscure the other or even distort the effects of government anti-poverty programmes.

In Nigeria rural poverty are relatively high. A national poverty survey carried out indicates that the high tropic areas have moderate poverty while the northern regions have poverty levels that are as high as 60% (Oduola, 1997; Okunmadewa et al., 2005; NBS, 2009). The average national poverty incidence indicates that this situation has not improved during the last 20 years in a majority of sub-Saharan Africa countries, Nigeria included (World Bank, 2008; Apata et al., 2009). The main problem lies in the fact that despite the high incidence rates in Nigeria little is documented on policy related determinants of rural poverty, making it very difficult to effectively set and implement sustainable anti-poverty policy programmes. The objective of this study was therefore to empirically determine the factors that help households' exit from chronic poverty. But up till now in Nigeria, there has not been any nationwide attempt to econometrically estimate the determinants of poverty in recent times. However, various studies that have been done in the past including World Bank (2008), Onah (1996), Echeberi (1997) Ogwumike and Ekpeyong (1996), Anyanwu (1997), Oduola (1997), Englama and Bamidele (1997), among others deal with identification and analyzing the extent of poverty in Nigeria. None of them quantified the impacts of the factors influencing the poverty. In fact, while some African countries have econometrically studied the determinants of poverty in their respective domain, there has not been any for Nigeria (Reardon and Taylor, 1996; in Burkina Faso; Coulombe and McKay, 1996 in Mauritania, Owuor et al., 2007 for Kenya; and a host of others). The study underhand fills this gap.

METHODOLOGY

Area of study

Southwest is one of the six major zones in Nigeria. This zone include six states including Lagos, Oyo, Ogun, Ondo, Osun and Ekiti states. The Ondo and Ekiti are chosen for analysis in this study. Ondo State is the only oil-producing State in the zone and it enjoys attention from the Federal Government. This State receives in terms of monthly derivation, average ₦450 million monthly (that is about 3.6 Million US Dollars) in addition to monthly subvention. This

state is also regarded as the food basket of the zone. The Ekiti was selected based on the information of United Nation Human Development Reports (UNHDR, 2004) as the poorest State in the South-west, Nigeria. The study of these two states will give succinctly the poverty situation in the South-west of Nigeria.

Ondo State was created on February 3rd 1976 with its capital in Akure. The population of Ondo State was 2,249,548 in 1991. The 2006 National population estimated the state population as 3,441,024. The state lies between longitudes 4.00 and 6.00 E and latitudes 5.45 and 8.15 N and made up of 18 Local Governments Areas (LGAs). Similarly, Ekiti state was created on 1st October, 1996 with its capital in Ado-Ekiti. The estimated population on creation in October 1996 was put at 1.75 million, while 2006 Provisional population figures are estimated as 2.38 million people. Ekiti State is situated entirely within the tropics. It is located between Longitudes 40 45 1 East of Green Meridian and Latitude 70 15 1 to -80 5 1 North of Equator. It lies in the South of Kwara and Kogi State as well as East of Osun State. Ekiti State is bounded in the East and in the South by Ondo State and has 16 LGAs.

Data collection and sampling procedure

Both primary and secondary data were used for this study. Primary data was collected through the aid of a well-structured questionnaire. Secondary data came from the Central Bank of Nigeria (CBN), of various annual agricultural surveys from 1994-2005, National Bureau of Statistics (NBS), and browsing through the Internet. Data were collected on household size, farming enterprises, different livelihood diversification strategies, costs of inputs used, outputs taking for home consumption, volume of outputs sold, revenue and household expenditure, food spending expenses and monthly expenses on asset among others. Data on farm specific questions that addressed issues such as land ownership, farm size and related production activities were collected, while data on market factors, distance to the local market and access to credit market were collected.

A multi-stage random sampling method was applied while collecting the primary data. The first stage involves the random selection of 2 Local Government Areas (LGAs) from each senatorial district (each state consists of 3 senatorial districts: the Central, the Southern and Northern areas respectively). While the second stage of the sampling procedure demand the selection of villages proportionate to the village population of the identified LGA. Final selection thus, necessitated random selection of sample size/respondents that is also proportionate to the village population selected in the second stage of the sampling procedure. However, 500 households have complete data needed for the purpose of analysis.

Variables and hypothesised effects

The dependent variable was dummy with those households living below a dollar per day per person represented with (1) implying that the household is chronically poor and 0 otherwise. Thus, factors that negatively influence the dependent variable are those that reduce poverty, while those with positive effects increase prevalence of poverty. Table 1 presents explanatory variables with their hypothesized effects on chronic poverty and as indicated, access to credit is theoretically expected to reduce poverty through cash investment in productive activities and also smoothing consumption. The aged household head is perceived to be less productive and consequently the household is expected to be chronically poor.

Access to education as well as exposure to agricultural workshops was also hypothesised to reduce chronic poverty, implying that the more educated the decision maker the better skilled and

Table 1. Hypothesized effects of explanatory variables on chronic poverty.

Variables	Definition	Hypothesized effect on poverty
Access on MFB credit	If has access to MFI credit (Yes, No)	(+)
Access to other credit	If access other credit (Yes, No)	(+)
Age of head	Age of decision makers in years	(+,-)
Education of head	Formal education of decision makers in years	(-)
Seminars attendance	If attended agric-seminar last year (Yes, No)	(-)
Sex of household head	If decision maker is female (Yes, No)	(-)
Ownership of land title	If owns title to farm land (Yes, No)	(-)
Remittances	Has access to constant remittances (Yes, No)	(-)
Hours spent on non-farm activity	Hours spent daily on non-farm activity (hours)	(-)
Belonging to cooperative	If member of self-help group (Yes, No)	(+,-)
Distance to market	Distance to the local market (Kilometres)	(+)
Value of livestock assets	Value of livestock seeds (Naira)	(-)
Access to extension	If access to extension services	(-)

skilled and productive he or she is and consequently experiences less poverty. Female involvement in decision making was hypothesized to have either positive or negative effects on chronic poverty. Traditionally, no theoretical foundations exist on gender and poverty. Nonetheless, in Africa more women than men are involved in rural economic activities such as farming. However, at the same time majority of women in Africa have no rights to property, a factor that infringes on their access to either input or credit markets which drags their households towards poverty.

Landholding size on the other hand releases the binding of land constraint for all sorts of enterprises and is also an asset which enables households to easily access both input and credit markets. Literature on land ownership indicates that land enhances the chances of diversification into varieties of enterprises and thus, improves the overall farm profitability and reduces poverty levels. Constant access to remittances, livestock assets and engagement in non-farm activities presents households with additional income for productive investment and/or consumption smoothing -- which are expected to have a negative impact on chronic poverty. Experienced farmers that readily have access to government programmes such as the one currently executing in Ondo State are hypothesized to perform better in agricultural production resulting into lowering poverty. Levels compared with their counterparts in Ekiti State. However, with respect to Farms located at a greater distance from inputs and outputs markets are expected to be poorer than those located nearer to the markets due mainly to the high transactions costs that infringe on their farm incomes.

Analytical method

Universally chronic poverty is defined as a condition whereby the average per adult income is less than US\$ per day. Denoting per person income (or expenditure) by X and chronic poverty line by Z , Chronic poverty (P_c) can then be expressed as:

$$P_c = \int_0^Z \square(Z, X) f(X) dx \quad (1)$$

Where $\square(Z, X)$ is the deprivation suffered when household's income is X , whereby is Zero when $X \geq Z$ (that is) when income per person is above one dollar or above chronic poverty line) and 1 otherwise. Therefore, chronic poverty is equal to (1) if average per person income in a household is less than 1 US\$ per day and (0) otherwise. This implies that factors with positive influence on P_c are those that increase the probability for a given household to remain

below chronic poverty line, while negative factors are those that reduce the profitability of a household staying below poverty line, in Nigeria, a chronic poverty is equated to income per person per day that is below 1\$ or ₦145; thus, to arrive at the dollar rate, the total household expenditure per day (an equivalent to daily full income) then divide by the number of household members. The probability estimation of these factors follows a binary probit model (Greene, 2003) as below.

$$\text{Prob}[D_i = j] = \frac{\exp(\beta_j X_i)}{S(j=0-j)\exp(\beta_j X_i)}, j = 0, 1 \dots j \quad (2)$$

Where X_i is a vector of covariates that define household characteristics, with the log likelihood function expressed as:

$$r(D_i = 1) = \frac{1}{1 + \sum_{j=1}^j \exp(\beta_j X_i)} \quad (3)$$

In its reduced form, the model becomes

$$\frac{P}{D(0, 1)} = \beta_0 + \beta_{ij} X_{ij} + \epsilon, \quad (4)$$

Where, D is the indicator for a household falling below chronic poverty line, P is the probability of event's occurrence, while X_i is a vector of household socio-economic characteristics, covering household specific factors such as age, education, household size, ownership of title to land, access to transfers, non-farm employment, market characteristics such as distance to the markets, credit markets and community based factors such as group memberships. β_0 β_i are the corresponding vectors of parameters and ϵ is the disturbance term. Similar analytical methodology has been employed by (Prereira, 1993; Adeoti and Adewusi, 2005; Owuor, 2007).

RESULTS AND DISCUSSION

Basic statistics¹

Most demographic variables had the expected signs. The

¹At the period when these data was collected \$1 = ₦ 125

Table 2. Basic statistics of variables that influences food transitions matrix.

Selected variables	Ondo State		Ekiti State	
	Mean	Std. deviation	Mean	Std. deviation
Household Information				
Age	43.55	8.248	46.97	18.193
Marital status	1.77	1.440	2.07	1.615
Educational level	2.81	0.930	3.04	0.955
Religion	1.43	0.699	1.43	0.813
Household size	9.65	6.480	7.83	6.378
Income generation (monthly)				
Income (monthly) ₦	40668.71	35000.04	30672.68	18,5002
Upkeep allowances ₦	37347.57	18652.19	21273.63	11771.05
Income to upkeep %	81.45	43.17	85.55	39.14
Expenses on asset ₦	8224.35	5604.29	6586.85	1117.10
Expenses on non-food ₦	9018.48	2452.65	7201.77	2727.15
Expenses on food items ₦	11213.43	8113.52	8639.43	2675.15
Expenses on asset in total %	39.51	21.94	33.28	11.25
Expenses on non-food in total %	12.14	8.75	8.83	3.41
Expenses on food in total %	48.35	25.18	57.79	17.51
Farm income in total %	54.42	21.51	56.48	17.82
Non-farm income in total	37.69	11.38	29.94	15.43
Farm produce consumed at home %	30.32	12.17	27.09	10.38

mean age in Ondo state is 43.55 years, while that of Ekiti State is 46.97 years. Marital status analysis revealed that most respondents in Ondo State are married than what we have in Ekiti. The educational status shows that people in Ekiti State have higher qualifications than their Ondo State counterparts (Table 2). On income generation among the respondents, Table 2 reveals that average monthly income in Ondo State is higher by ₦ 9996.03 (Table 2). Similarly, an upkeep allowance in Ondo State has an improved income of ₦16073.94. This indicates those respondents in Ondo State contributed more of their income generation to upkeep allowances. The analysis of percentages of the expenses on food items in total expenses revealed that farming households in Ekiti spend more on food needs by 9.44% (Table 2). Also income consumed outputs analysis (that is outputs taking from their farms for home consumption) indicates more farm produce are consumed in the homes of Ondo State respondents than those in Ekiti State respectively. Moreover, the contribution of non-farm income to household income increases households' income significantly. This led to improvement of disposable income and also allocation for food needs as well. The analysis further shows that respondents from Ondo state diversified more to non-farm activities and the percentage of this income is higher by 27.7%. Results from the analysis of Probit Regression model shows that log likelihood ratio χ^2 (130.73) is significant at 1% level with 16 degrees of freedom. In addition to the pseudo R^2 of 0.27 this is above the statistically minimum level of 0.20.

Thus, confirming that a large proportion of changes in the poverty indicator are attributed to the exogenous factors considered. Evidence from the inferential statistics in Table 3 revealed that the explanatory variables included in the model are significant in explaining changes in poverty incidence among the sampled households. The disaggregation analysis of the regression model illustrate that access to credit facilities from Micro-Finance Bank (MFB) (0.127), education (0.068), participation in agricultural workshops/seminars (0.617), constant access to remittances (0.351), livestock asset (0.513) and access to extension services (0.418) significantly reduce the probability of the household staying below the poverty line. These coefficients are significant at the 10, 5 and 1% significance level respectively. Conversely, female head of household increases the probability of households remaining below poverty line. Although, not significant, distance to the market increase the probability of remaining below the poverty line. In addition though not significant in reducing poverty, are belonging to cooperatives, ownership to land title and engagement in non-farm activity as measured in time spent daily on non-farm activity.

The coefficient of micro-credit (MFB) on reducing the probability of a household falling below poverty line is as expected and significant at 10%. The significant effects of having access to credit facilities in lifting households out of chronic poverty is due to the ease with which such funds can be used in various activities in the household. The tangible nature of this credit allows borrowers to meet

Table 3. Probit MLE of determinants of chronic poverty in Nigeria.

Variables	Coefficients (Std. error)	T. statistics
Access on MFB credit	-0.127 (0.058)	-2.19*
Access to other credit	-0.038 (0.116)	-0.33
Age of head	-0.012 (0.008)	-1.50
Education of head	-0.068 (0.013)	-5.23***
Seminars attendance	-0.617 (0.193)	-3.20**
If household head is female	0.469 (0.204)	2.30*
Ownership of land title	-0.203 (0.191)	-1.05
Remittances	-0.351 (0.108)	3.25**
Hours spent on non-farm activity	-0.309 (0.099)	3.12**
Belonging to cooperative	-0.018 (0.012)	1.50
Distance to market	0.015 (0.006)	1.89
Value of livestock assets	-0.513 (0.196)	2.60*
Access to extension	-0.418 (0.113)	3.70***
Intercept	1.518 (0.219)	5.22***
Log Likelihood	-418.21	
LR χ^2	112.85	
Pseudo R^2	0.315	

other consumption expenditures such as medical, school fees, food and social emergencies besides expenditures on productive inputs. In their survey conducted in Islamada, Lombok in Indonesia, micro credit was given to women who were under the poverty line and after one year, the average income of 90% of the beneficiaries had increased enough to move them out of poverty line (Grameen, BRAC and RD-12). Also, the work of Panjaitan-Drioadisuryo et al. (1999), Owuor (2007) and Khandker (1998), measured varying effects of micro credit programs on participants and found that informal borrowing reduces poverty by increasing per capita consumption among program participants. These authors also observed an increase in labour supply on farms, indicating that borrowers hired more labour.

On education, present findings indicate that better education have the effect of enabling households accessing and conceptualizing information on good farming methods, accessing better paying rural labour market and capable of profitably combining various enterprises. Therefore, education provides important indicators of household welfare and that raising poor household's access to education is likely to have beneficial effects on poverty alleviation and income distribution over the long run. Households headed by females on the other hand had a higher probability of staying below poverty line, echoing the nature of structures of many rural communities in Africa. Majority of females in Africa have no legal right to property making them unable to offer asset securities in either credit or product markets. Such differential access to productive asset and inputs leads to inequality in welfare. Furthermore, with the rising migration of male to urban areas for higher paying jobs, this leads to a decline in agricultural production as

women who are left to manage farms have less access to both improved inputs and credit markets given that they have lower accesses to collateral. Such gender gaps lead to static inefficiency and also reduce efficient investments in new technologies as well as in the maintenance and improvement of assets, particularly land. Consequently women led households continue to languish in poverty.

Results on involvement in non-farm activity translate to regular earnings from other labour employment and business investments. Given that agriculture is characterized by seasonal variations in production as well as longer production cycles many households diversify into non-farm investments with regular incomes, others also take off-farm employment as part time activities. For example a large proportion of farmers in the sample combine farming with some off-farm activities such as trading of manufactured goods, a factor that ameliorates persistence poverty.

Evaluation of land ownership against poverty shows that there exists a strong association between constrained landholding and rural poverty, suggesting that ownership of property such as land title enables households to easily have access to credit facilities, a factor that improves on cash investment in production with consequential reduction in poverty. An examination of access to land by different poverty categories in Nigeria indicates that the area of land cultivated is strongly associated with household per capita income. This also applies to assets such as livestock. In Africa livestock asset are widely used in preparation of land such as the case of ox-drawn ploughs which reduce expenditure on labour thus enabling timely land preparation.

Results on the effect of access to extension services indicate that agricultural productivity is important in

ameliorating rural poverty. Thus exposure to modern farming techniques and good farm management principles can improve farm productivity and useful in ameliorating rural poverty. Similar findings have been reported in Latin America. The works of De Janvry and Sadoulet (2000) in Latin America established that rural poverty has a strong association with rural development through agriculture production, implying that agricultural potential has a role to play in poverty incidences. Results analysis that show constant access to remittances reduces the probability of the household staying below poverty line, pointing at the heavy reliance of households on remittances particularly among the households residing in Ekiti State. Constant reliance on remittances is however, not a good poverty intervention instrument as such remittances emanating mainly from siblings and other working relatives. The results however, indicate constraints in access to external financial resources, a factor that calls for increasing credit availability.

CONCLUSIONS AND POLICY RECOMMENDATIONS

Access to micro-credit, education, participation in agricultural seminars, livestock assets and extension services significantly reduce chronic poverty among rural households in Nigeria. On the other hand, female headed households and households located far away from local markets have a high probability of staying below chronic poverty line. Thus, these variables are significant in capturing the key rural poverty determinants. However, gender disparities in property rights has a consequence on poverty, as women empowerment through legal rights to property as key chronic poverty ameliorating factors among the farming communities. Nonetheless, given the variability in prioritization of assets in different cultural backgrounds all over the world more research that takes into account other household assets in arriving at a poverty index as well as inclusion of factors such as customs and traditions in influencing relativity in poverty needs to be carried out.

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