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Spatial dimension of poverty in rural Nigeria

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Poverty is a rural phenomenon in Nigeria. This study investigated poverty profile across geopolitical zones in rural Nigeria, using the 2003/2004 NLSS data. The result of FGT poverty decomposition shows that majority of the poor (84%) live in the rural area. Northwest zone had the highest relative contribution to incidence and depth of national rural poverty (29 and 30% respectively) while Southwest had the least relative contribution (4 and 3% respectively). Although North-central had the highest level of severity of rural poverty (P_2 = 0.1454), North-west accounted for the highest relative contribution (30%) to national rural poverty.

Key words: Poverty, assets, rural, geopolitical zones, Nigeria.

INTRODUCTION

With per capita income (PCI) falling significantly to about $300 between 1980 and 2000 (well below the Sub-Saharan average of $450), approximately 90 million of Nigeria's 133 million people are living in absolute poverty, on less than one dollar a day (World Bank, 2001). If Nigeria fails to reduce poverty quickly enough, it is unlikely that the MDGs will be achieved in Africa or globally. The report further stated that the Gross domestic product (GDP) growth over the three years prior to 2003 was estimated at an average of around 3.5% per year - barely above population growth of around 2.6% and far lower than the 5% per capita growth rate.

Over the years, Nigeria is a country that has experienced a high incidence of poverty and inequality. She has also not been quite successful in poverty alleviation as available evidences suggest that there are increasing number of poor people in Nigeria - 27.2% in 1980, 46.3% in 1985, 42.8% in 1992 and 65.6% in 1996 (Okojie et al., 2001; Canagarajah et al., 1997). These have been largely traced to the adverse macroeconomic performance of the economy that was largely dictated by the effects of negative economic shocks and the adjustment reforms that were initiated in response to these shocks.

The headcount ratio of 27.2% for 1980 in Nigeria translated to 17.7 million poor persons in 1985. Despite the drop in poverty level in 1992, the proportion in poverty was about five million higher than the 1985 figure. And by 1996, the population in poverty had increased sharply to 67.1 million. This was mainly because a sharp increase in population growth has not enabled Nigeria to realize large reductions in the number of poor people (National Policy on Poverty Eradication Draft, 2000).

The worrisome aspect of this phenomenon is the spatial differences in the incidence of poverty in Nigeria. There are considerable differences between regions in the concentration of the poor and the non-poor in separate communities. There are also large differences between regions in their share of the poor and non-poor communities. Whereas nearly two-thirds of the non-poor communities are in the south, almost half of the poor communities are in the north. In the south, only 18% of the region's population resides in communities that have been classified as poor whereas in the north nearly half of the population of that region resides in such communities (World Bank, 1996). The spatial distribution of poverty in Nigeria in 1996 as presented by FOS (1999) shows that the North West region had the highest incidence of poverty, with 69.3% of the population in poverty while the South East region had the lowest incidence. The North West region accounted for about 40% of the poor in Nigeria. This was followed by the South West, which contributed 18.7% to the national incidence of poverty. The North East region had the highest depth of poverty while the North Central had the highest severity of poverty.

This decomposition of poverty by geo-political zones highlights two aspects of the poverty profile. One is that

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contribution to poverty tends to be higher in the northern part of the country. Thus, both measured poverty and contribution to poverty are higher in the north. The second aspect is that while contributions to poverty tend to decline with intensity of poverty in the south, they tend to rise in the north. Both aspects thus suggest that the north constitutes the bulk of the poverty problem in the country.

The report using the National Consumer Survey (NCS) for 1985 and 1996 further shows that there was a five per cent increase in the depth of rural poverty, though there was improvements associated with rural growth and reduction in inequality. There was a five per cent increase in the depth and a 7.4% increase in the severity of rural poverty, between 1985 and 1995. Also, growth in rural incomes reduced poverty by about eight per cent and equitable distribution by another six percent. Despite these improvements, rural poverty increased in depth and severity. One possible explanation could be the huge change in the rural household size. Between 1985 and 1995, rural households increased from an average of 5.7 in 1985 to about 7.3 members in 1995 (FOS, 1999).

According to FOS (1999) report on the poverty profile in Nigeria, poverty incidence in male-headed households increased from 47.4% in 1985 to 57.2% in 1996/97. This indicates a ten per cent increase in the incidence of poverty, averaging about 0.9 per cent points a year for the male-headed households. Also, the incidence of poverty among female-headed households rose from 41.3% in 1985 to 47.2% in 1996/97. This shows an increase of 5.9% averages at about 0.5% points annually. In sum, the contribution of female-headed households to national poverty rose from 10.6% in 1996/97 to 13.3% in 1985. The gender distribution of poverty is consistent with the evidence from earlier studies that suggests that poverty is more pronounced among male-headed households (Canagarajah et al., 1997; and Aighokhan, 1997).

United Nations Human Development Report (1998) declares that Nigerian poverty level is getting worse by the day and more than four in ten Nigerians live in conditions of extreme poverty of less than N320 per capita per month, which barely provides for a quarter of the nutritional requirements of healthy living. This is approximately US$8.2 per month or US27 cents per day. The report ranked Nigeria 146 out of a total of 174 countries in its Human Development Index (HDI), which measures achievement in terms of life expectancy, education and real income per capita. The poverty situation in the country worsened as the report ranked Nigeria 151st and 158th out of 174 countries in the year 2000 and 2007/2008 respectively.

Due to high incidence of poverty in the rural areas of the country, it is therefore pertinent to investigate rural poverty across the regions in the country. The specific objective of this paper is to present the poverty profile of rural Nigeria across the geo-political zones.

THEORETICAL FRAMEWORK

Poverty is an unacceptable deprivation in well-being (World Bank, 2001). It exists when there is lack of the means to satisfy critical needs. Poverty can be regarded as the status, objective or subjective, of an individual or a population. Poverty will have an objective definition once observable and measurable indicators exist that are used to approach the material or other aspects of the lives of individuals. On the other hand, the subjective definition of poverty is when judgment (including value judgment) of individuals is taken into consideration in order to investigate their welfare (Boccanfuso, 2004).

Poor people live without fundamental freedoms of action and choice that the better off take for granted (Sen, 1999). They often lack adequate food and shelter, education and health, deprivations that keep then from leading the kind of life that every one values. They also face extreme vulnerability to ill health, economic dislocation, and natural disasters. And they are often exposed to ill treatment by institutions of the state and society and are powerless to influence key decisions affecting their lives. These are several dimensions of poverty (World Bank, 2001).

Bradshaw (2006) itemized five theories of poverty. This first theory of poverty is a large and multifaceted set of explanations that focus on the individual as being responsible for their poverty situation. The economic theory that the poor lack incentives for improving their own conditions is a recurrent theme in articles that blame the welfare system's generosity on the perpetuation of poverty. A less widely critiqued version of the individualistic theory of poverty comes from American values of individualism that any individual can succeed by skills and hard work, and that motivation and persistence are all that are required to achieve success (Asen, 2002). Self-help literature reinforces the belief that individuals fail because they do not try hard enough.

The second theory of poverty roots its cause in the "Culture of Poverty". This theory is sometimes linked with the individual theory of poverty or other theories to be introduced below but it recently has become so widely discussed that its special features should not be minimized. This theory suggests that poverty is created by the transmission over generations of a set of beliefs, values, and skills that are socially generated but individually held. Individuals are not necessarily to blame because they are victims of their dysfunctional subculture or culture. Whereas the first "individualistic" theory of poverty is advocated by conservative thinkers and the second is a culturally liberal approach, the third to which we now turn is a progressive social theory. Theorists in this tradition look not to the individual as a source of poverty but to the economic, political, and social systems which cause people to have limited opportunities and resources with which to achieve income and well-being.

The fourth theory states that poverty is caused by

geographical disparities. Rural poverty, ghetto poverty, urban disinvestment, southern poverty, third-world poverty, and other framings of the problem represent a spatial characterisation of poverty that exists separate from other theories. While these geographically based theories of poverty build on the other theories, this theory calls attention to the fact that people, institutions, and cultures in certain areas lack the objective resources needed to generate well-being and income, and that they lack the power to claim redistribution. As Shaw (1996) points out, "Space is not a backdrop for capitalism but rather is restructured by it and contributes to the system's survival. The geography of poverty is a spatial expression of the capitalist system. Weber and Jensen (2004) note that most literature finds a "rural differential" in poverty but that the spatial effect is not as clearly isolated from individual effects as needed for confidence.

The previous four theories have demonstrated the complexity of the sources of poverty and the variety of strategies to address it. The final theory of poverty looks at the individual and their community as being caught in a spiral of opportunity and problems, and that once problems dominate they close other opportunities and create a cumulative set of problems that make any effective response nearly impossible (Bradshaw, 2000). The cyclical explanation explicitly looks at individual situations and community resources as mutually dependent, with a faltering economy, for example, creating individuals who lack resources to participate in the economy which makes economic survival even harder for the community since people pay fewer taxes. For example, at the community level, a lack of employment opportunities leads to outmigration, closing retail stores, and declining local tax revenues which leads to deterioration of the schools, poorly trained workers, inability of firms to utilize cutting edge technology and the inability to attract new firms to the area which leads back to a greater lack of employment.

The poverty cycle also repeats itself at the individual level. The lack of employment leads to lack of consumption and spending due to inadequate incomes, and to inadequate savings which means that individuals can not invest in training, and individuals also lack the ability to invest in businesses or to start their own businesses which leads to lack of expansion, erosion of markets and disinvestment, all of which contribute back to more inadequate community opportunities.

As a theory of poverty, the cyclical theory shows how multiple problems cumulate, and it allows speculation that if one of the linkages in the spiral was broken, the cycle would not continue. The problem is that the linkages are hard to break because each is reinforced by other parts of the spiraling system.

As a concept, poverty has subsequently found itself in the centre of the economic theory of social choice. Behind poverty, economists and sociologists are in agreement that it constitutes a situation deemed economically and socially unacceptable or unjust. There are

two main schools of thought in analysing poverty. First, are those who concentrate in practice on comparisons of indicator of welfare (economic well-being or standard of living). Hence, the name welfarist approach which refers to the microeconomic concept of utility. This approach consists in practice of comparing the economic welfare (or standard of living) of households or individuals.

Second are the non-welfarists whose approach is basically regarded as being more social in character than the previous one, although an increasing number of economists have become interested in it in recent years. There are two main currents among the adherents of this school. These are the basic needs approach and capabilities approach. The point common to these two schools of thought is that a certain phenomenon, which remains to be defined, has not reached a level that is regarded as a reasonable minimum. The divergent points concern the nature of this missing situation, as well as the method of determining a threshold that we will call the poverty threshold, beneath which a member of society will be categorized as poor.

This study will adopt the relative poverty line as dictated by the data available. This is because the NLSS data does not include data on physical quantities of food consumed. It is thus not possible to estimate neither food poverty line nor the absolute poverty line. Hence we set the poverty line based on household expenditure. Our poverty line is thus set equivalent to the two thirds of the mean per capita expenditure following Olaniyan (2000).

METHODOLOGY (DATA SOURCE AND ANALYTICAL TECHNIQUE)

The data used for this study were from the 2003/04 Nigeria Living Standard Survey (NLSS) data from the National Bureau of Statistics (formerly known as the Federal Office of Statistics). The sample design was a two-stage stratified sampling. The first stage involved the selection of 120 Enumeration areas (EAs) in each of the 36 states and 60 EAs at the Federal Capital Territory (FCT). The second stage was the random selection of five housing units from each of the selected EAs. A total of 21,900 households were randomly interviewed across the country with 19,158 households having consistent information (NBS, 2005). For the purpose of this study, the secondary data was first stratified into rural and urban sectors. The second stage was the stratification of the rural area based on the six geo-political zones of Nigeria viz: South West, South East, South South, North Central, North East and North West. The next stage involved the selection of all the sampled rural households in each of the geo-political zones. The data set provides detailed records on household expenditure (which was used as a proxy for household income) and household characteristics. However, 14,514 rural households whose responses were consistent were used for analyses in this study.

Analytical technique

In this study, poverty rate was calculated by comparing the total expenditure of every household with the corresponding poverty line. Suppose income x of an individual is a random variable with the distribution function F(x). Let z denote the poverty line, the

threshold expenditure below which one is considered to be poor. Then F(z) is the proportion of individuals (or families) below the poverty line. The relative poverty line is estimated based on the expenditure profile of respondents on basic needs (food and non-food items). However, the total household PCE is used as proxy of standard of living. This method was applied by several authors (World Bank, 1996; Canagarajah et al., 1997; Olaniyan, 2002). Here, the total PCE is the sum of cash expenditure on consumption of food and non-food items relative to individual household size.

$$\text{Mean PCE (MPCHHE)} = \frac{\text{Total PCE}}{\text{Total number of Households}}$$

The non-poor threshold is the region greater than two-thirds of MPCHHE while the moderate poverty line ranges from one-third to two-thirds of MPCHHE; and The core-poor threshold is the region less than one-third of MPCHHE. This study adopted Foster, Greer and Thorbecke (1984) approach to estimate the incidence, depth and severity of poverty in the study area. The FGT indices are calculated by taking the proportional shortfall in expenditure for each poor household and normalising the sum by the population size.

RESULTS AND DISCUSSION

This section presents the distribution of PCE of rural households by their socio-economic characteristics. Results on Table 1 show that PCE of female-headed households was higher (₦38, 076.80) than those of male-headed households (₦26, 937.90). This implies that female-headed households had better welfare than male-headed households in rural Nigeria. This corroborates the findings of World Bank (2007). Among the GPZs, female-headed households in South East had the highest (₦46, 904.07) mean PCE while those in North Central had the least (₦23, 355.60). However, male-headed households in South West had the highest (₦32, 248.46) mean PCE. Overall the result shows that there is significant difference between means of household per capita income (expenditure) of both genders. Also, there is no significant difference between the means of PCE of both male- and female-headed households in South South and North Central zones. This implies that a typical rural female heads take on more financial obligations in their homes than their male counterparts except in South South and North Central.

Household PCE is expected to decrease gradually with the age of the household head, but this is only up to a certain age. After reaching a trough, it starts to increase as the number of dependants decreases. The result also, presents the relationship between age and the PCE for all households and across the GPZs. Reflecting to some extent the age-income relationship, the mean per capita household expenditure decreases as the household heads become older, and it reaches a trough at between ages 40 - 49. Thereafter, it increases. One of the main factors is that household size becomes larger as the household head gets older; but after the children become

independent, it becomes smaller. The result shows that at the national level, the PCE was highest (₦4, 2314.85) among households whose heads were less than 20years of age but lowest (₦24, 885.73) among those within 40 - 49 years. This implies that households whose heads were less than 20 years of age were able meet their basic needs than those whose heads were within 40 - 49 years age range. However, households with aged heads (>60 years) had higher PCE than those within 40 - 49 years of age. The same trend was observed across the GPZs except in South East and North Central, where household with heads within 20 - 29 years of age had the highest PCE. Further, the result shows a significant difference in the means of PCE across the age groups in all the GPZs.

The results on Table 2 reveal that overall, the PCE and standard deviation of non-farming households was higher (₦36, 028.13) than for farming households (₦25, 698.28). This reveals that households that were primarily engaged in farming activities had a better standard of living than their farming counterparts. A similar trend was observed in all the GPZs. Non-farming households in South West had the highest (₦41, 921.31) PCE while farming households in North East had the least (15, 781.32). Further, across the GPZs, the PCE of non-farming households differs significantly from that of farming households. This indicates that non-farming households were able to meet their basic financial needs than farming households.

As expected, the results show that PCE decreased with increasing household size (Table 2). Thus, households with less than six members had the highest (₦33, 303.77) PCE while those with more than 15 members had the least (₦10, 023.51).

A similar trend was observed across the GPZs. In addition, there was significant difference in the means of PCE among the household size groups in all the GPZs. This shows there is a negative relationship between household size and household expenditure. The policy indication of this is that an effective welfare policy package should incorporate reproductive health programme, with emphasis on birth control.

Per capita expenditure and household capital assets

Overall, the PCE of households whose heads were members of social groups was higher (N29, 548.41) than non-members. A similar trend was observed in all the GPZs with the exception of South East. However, across the GPZs, the PCE of households with membership of social group (social capital) was not significantly different from that of those who were not members in Southern zones (South East, South South and South West), where the proportion of social group membership was higher than non-membership (Table 3). This implies that local institutions have not significantly improved the welfare of their members in these southern zones.

Table 1. Distribution of PCE by gender and age.

Characteristics	Statistics	NC	NE	NW	SE	SS	SW	National
Gender								
Female	Mean	23355.60	28127.38	32967.52	46904.07	34475.42	42973.61	38076.80
	Std deviation	23869.63	18358.87	22026.50	77603.84	27231.32	27482.56	51374.64
Male	Mean	25931.38	21874.15	19333.77	38065.50	32685.23	38248.46	26937.90
	Std deviation	36573.55	17344.72	14471.29	33014.73	28757.64	36945.22	28096.58
	T-test	1.16	3.69***	3.55***	2.90***	1.29	1.98**	9.38***
Age								
<20	Mean	28087.07	31980.01	34164.52	33779.26	79791.01	55206.33	42314.85
	Std deviation	24234.06	14760.79	35118.18	21808.07	50495.05	11131.13	32354.175
20 - 29	Mean	37730.89	30011.03	26798.22	53477.77	45565.13	50357.47	36600.00
	Std deviation	34190.38	23990.27	17886.327	39102.37	36530.39	29987.04	30640.46
30 - 39	Mean	28524.07	22793.16	20382.57	39030.35	36047.93	38354.44	27454.94
	Std deviation	34329.60	16869.717	14879.45	32843.95	27843.08	30711.72	26045.80
40 - 49	Mean	22618.92	19618.06	17301.49	34295.88	31944.48	37837.10	24885.73
	Std deviation	23483.15	14798.06	11393.22	27318.45	29157.04	34689.31	23532.70
50 - 59	Mean	21337.02	18708.07	18646.18	35689.66	28562.57	35639.90	25841.51
	Std deviation	21029.09	13582.01	15718.12	27235.46	23853.50	30145.11	23120.52
>60	Mean	23572.65	22084.98	19153.16	47104.75	30380.67	40204.75	32425.64
	Std deviation	55646.54	17625.48	14780.21	72371.47	25929.07	39451.38	49079.70
	F-value	10.12***	22.59***	18.52***	6.95***	16.73***	2.55**	40.79***

Table 2. Distribution of PCE by household size and primary occupation.

Characteristics	Statistics	NC	NE	NW	SE	SS	SW	National
Household size								
1 - 5	Mean	29437.92	26026.54	22416.15	46421.77	37597.01	42427.28	33303.77
	Std deviation	41699.87	19197.64	15382.86	58450.00	30594.38	36700.17	37416.64
6 - 10	Mean	19346.53	16349.37	16508.55	28413.49	22279.21	21356.81	19928.52
	Std deviation	19009.67	11977.19	12959.79	22866.06	18638.98	11085.36	17281.81
11 - 15	Mean	16247.63	13573.84	13650.51	25857.39	22116.19	19293.47	15829.48
	Std deviation	10772.11	9819.55	12241.30	18374.88	13518.93	11954.26	12603.85
>15	Mean	14087.41	12997.35	11309.42	55000.62	21805.71	-	14393.45
	Std deviation	5791.10	5885.67	6119.19	0.00	0.00	-	10023.51
	F-value	19.25***	80.49***	55.52***	22.42***	50.54***	28.24***	214.52***
Primary occupation								
Non-farming	Mean	27950.66	30834.76	26459.16	47319.54	36888.42	41921.31	36028.13
	Std deviation	47360.94	23854.17	21880.90	41240.72	29254.19	43441.73	37704.24
Farming	Mean	24685.63	20793.49	18683.37	37907.15	29329.04	37697.32	25698.28
	Std deviation	28892.66	15781.32	13341.07	53926.39	27058.90	28087.11	29870.62
	T-test	1.84*	7.83***	6.22***	4.59***	6.52***	1.90*	15.36***

Table 3. Distribution of PCE by capital assets.

Capital assets	Statistics	NC	NE	NW	SE	SS	SW	National
Social groups								
Non-members	Mean	27531.16	20772.68	18502.89	42813.68	32872.35	39211.8157	27058.64
	Std deviation	42632.95	15925.71	13991.15	71733.67	26540.50	33450.16741	36475.35
Members		24607.05	23585.60	20957.68	39471.21	33212.52	39470.11	29548.41
	Mean							
	Std deviation	30650.82	18773.67	15445.07	32998.55	29379.88	36098.72	28804.13
	T-test	2.08**	4.22***	4.51***	1.54	0.29	0.13	4.47***
Electricity								
No access	Mean	24735.45	21848.46	18842.10	38596.58	33241.64	37850.65	26865.32
	Std deviation	33675.36	17350.16	13854.84	56242.98	28443.25	26373.95	31223.75
Had access		29137.76	26279.82	27905.67	45300.61	32573.54	44152.60	35918.10
	Mean							
	Std deviation	41355.95	18102.23	20819.43	35079.66	28360.35	53669.26	36870.21
	T-test	2.36**	3.25**	6.34***	2.98***	0.47	1.91*	11.50***
Credit								
No access	Mean	25351.77	21833.40	19137.53	39492.59	32790.96	39704.58	28125.51
	Std deviation	37575.37	17569.74	14286.16	52681.28	28123.27	37216.34	33520.02
Had access		26812.08	24158.52	20740.20	46653.48	35188.47	37843.75	30123.55
	Mean							
	Std deviation	25112.63	16451.78	15800.54	38745.47	30359.12	22700.22	26901.38
	T-test	0.68	2.52**	2.36**	2.56***	1.36	0.96	3.12***
Education								
No formal	Mean	22198.31	20367.55	17321.18	41062.02	31009.40	38210.45	24972.65
	Std deviation	22455.14	14863.91	11962.42	66687.031	27396.77	35550.91	31573.54
Elementary		22368.38	14772.35	20988.21	41848.76	27510.17	29717.58	28155.80
	Mean							
	Std deviation	19773.057	10851.19	12592.02	56924.48	20695.93	21406.51	35330.15
Primary		39311.40	25741.37	25371.77	39110.75	29033.25	38054.63	34083.18
	Mean							
	Std deviation	116683.31	19930.88	14209.54	41600.74	23620.02	26586.71	53260.98
Secondary		27781.70	27243.60	25590.24	40165.36	33419.21	36515.67	32860.71
	Mean							
	Std deviation	36405.24	22092.93	19228.21	32212.20	27348.13	26371.73	29782.48
Tertiary		37420.8952	38591.07	41174.14	51319.27	46986.22	68833.8411	45976.69
	Mean							
	Std deviation	33883.61	23600.59	30589.56	39817.58	39135.39	63630.21	40843.85
Non-formal		29397.24	21447.01	21204.86	36023.89	38333.82	45489.27	24666.16
	Mean							
	Std deviation	23637.41	19540.83	16003.20	28585.71	39905.45	35616.63	22293.79
F value		10.12***	25.68***	38.82***	0.80	7.46***	10.38***	70.87***

Since one's labour productivity is affected by the amount of knowledge, information and skills acquired, education is considered to be one of the key determinants of income inequality and poverty. The result further presents the relationship between the educational attainment of household heads and PCE. As expected, the per capita household expenditure increased with educational attainment. The PCE for households with tertiary education was 1.8 and 1.9 times as large as for those with no formal education and for those with non-formal education respectively. The result shows that at the national level, the PCE was highest (₦45, 976.69) among

households whose heads had tertiary education but lowest (₦24, 666.16) among those with non-formal education. This shows that rural households whose heads had tertiary education had the best standard of living. The same trend was observed across the GPZs except in South South and South East zones, where household with heads without formal education had the higher mean PCE than those with elementary and primary education. Further, the result shows a significant difference in the means of PCE across the educational attainment groups in all the GPZs except in South South.

Further, households with access to credit had a higher (₦30, 123.55) mean PCE than those without (₦28, 125.51). The standard deviation was also lower (26, 901.38) among households with access to credit than those without access (33, 520.02). This reveals that households with access to credit were able to meet their basic needs than those who had no access to credit facilities. Also, disparity in income distribution among households with access to credit was higher than those without. There was no significant difference between the means of PCE of households with access to credit and those without in North Central, South South and South West. This is suggestive of low level of credit amount in these zones.

Rural infrastructure is expected to have a positive relationship with household income. The result shows that households with access to electricity had a higher PCE (₦35, 918.10) than those without electricity (₦26, 865.32). Also, the standard deviation was higher (36,870) among households with access to electricity than those without (31,223). This reveals that although on the average, households with access to electricity had a better welfare than those without, disparity in income distribution was higher among households with access to electricity than those without. In addition, the difference of means of PCE of households with access to electricity and those without electricity was significant overall and in all the GPZs except in South South. This could be as a result of close standard deviation (28,443 and 28,360.35) in South-South for those without access and those with access to electricity respectively. Thus, increased access to electricity will improve the welfare of rural households.

Rural poverty profile

This section presents the spatial analysis of poverty in rural Nigeria. The estimation of the poverty line shows that the mean PCE for Nigeria was ₦31, 764.00 and the moderate poverty line was adopted in this study was estimated as ₦21, 176.03. The result shows that 32.2% of female-headed households were poor while about 53.6% of their male counterparts were poor. This indicates that the incidence of poverty was higher among male-headed households than female-headed households. This trend was observed in all the GPZs except in North Central where poverty incidence was higher (P_0 = 0.6329) among female-headed households than among male-headed households (P_0 = 0.5623). The depth of poverty among male-headed households was deeper than among female-headed households. On the average, it would require N1, 233 to alleviate the poverty of the female-headed households and ₦2, 090 for the male-headed households (Appendix I). However, across the six GPZs, female-headed households recorded the highest (P_2 = 0.1994) and the lowest (P_2 = 0.0186) disparity in income distribution in North Central and South West respectively (Appendix III). This shows that if given equal opportunities as their male counterparts, female households would fare much better than the former.

As expected, poverty incidence increased with age of household head till age bracket 40 - 49 years (P_0 = 0.5714) and thereafter declined. The initial low level of poverty incidence can be linked to high PCE with the attendant low household size (Table 4).

Households whose heads were within 40 to 49 age group in North West had the highest (P_0 = 0.7489) incidence of poverty while none of the households whose heads were less than 20 years were poor in South South and South West. Poverty gap was highest (P_1 = 0.2302) among households whose heads were within 40 - 49 age bracket but lowest (P_1 = 0.1103) among households whose heads were less than 20years (Appendix I). The result indicates that on the average more resources should be transferred to the households whose heads were within 40 - 49 age bracket than to any other age category of households. However, households whose heads were less than 20 years old would require the least amount of resources in order to bring them out of poverty. The highest (P_2 = 0.1212) severity of poverty index was observed among households whose heads were within 40 - 49 years and the least (P_2 = 0.0501) among those within the age bracket of 20 - 29 years (Appendix III). This shows that as household heads advance in age, the gap in distribution of income widens, per capita income reduces and thus poverty level rises.

Households with more than 15 members had the highest incidence of poverty (P_0 = 0.8519) while households with not more than five members had the least incidence of poverty (P_0 = 0.4043). This implies that about 85% of households with more than 15 members and about 40% of those with not more than five members were poor. A similar trend was observed in all the GPZs. Poverty gap was highest (P_1 = 0.3893) among households with more than fifteen members but lowest (P_1 = 0.1423) among households less than six members (see Appendix 1). The result indicates that the larger the household, the more resources is needed to bring it out of poverty. Of the six GPZs, households with more than fifteen members in the North West had the highest (P_1 = 0.4692) poverty gap index while those with less than six members in the South East had the least (P_1 = 0.0548). The highest severity of poverty index was observed among households with over 15 members in North West (P_2 = 0.2929) while households with 1 - 5 members in

Table 4. Incidence of Poverty (Headcount ratio) and Socio-economic Characteristics of Household in Rural Nigeria.

Household characteristics	Definitions	NC	NE	NW	SE	SS	SW	National
Gender	Female	0.6329	0.3689	0.3939	0.2163	0.3630	0.1601	0.3219
	Male	0.5623	0.6180	0.6957	0.3073	0.4366	0.3037	0.5361
Age of household head	<20	0.7143	0.2222	0.5000	0.1667	0.0000	0.0000	0.2778
	20 - 29	0.3321	0.4407	0.4445	0.1623	0.2654	0.1765	0.3521
	30 - 39	0.4865	0.5729	0.6706	0.3287	0.35108	0.3041	0.5131
	40 - 49	0.6227	0.6849	0.7489	0.3295	0.42742	0.2972	0.5714
	50 - 59	0.6396	0.6968	0.7354	0.3209	0.5000	0.2992	0.5487
	$\geq$60	0.6706	0.5924	0.6996	0.2238	0.46746	0.2478	0.4543
Household size	1 - 5	0.4989	0.4902	0.5965	0.1965	0.3337	0.2226	0.4043
	6 - 10	0.6874	0.7837	0.7959	0.4597	0.6307	0.5509	0.6861
	11 - 15	0.7422	0.8545	0.8542	0.5000	0.5926	0.5000	0.7800
	>15	1.0000	0.8889	0.9091	-	-	-	0.8519
Primary occupation	Non-farm	0.5728	0.4351	0.5141	0.2072	0.3492	0.2319	0.3790
	Farm	0.5682	0.6338	0.7128	0.3110	0.4899	0.2946	0.5535

South East had the least (P_2 = 0.0233) (see Appendix III). Thus, poverty reduction policies emphasize family-planning especially in the North West, North East and North Central zones.

The results further reveal a higher incidence of poverty (P_0 = 0.5535) among households whose household heads were primarily engaged in farming activities than among those engaged in non-farming activities (P_0 = 0.3790). This suggests that about 55% of farming households and 38 per cent of non-farm households were below the poverty line. Farming households in North West had the highest incidence of poverty (P_0 = 0.7128) while non-farming households in South East had the least incidence of poverty (P_0 = 0.2072). This indicates that non-farming livelihood activities reduce the level of poverty incidence in rural Nigeria. This reveals the counter effect of semi-subsistence agriculture that is prevalent in the rural areas, characterized by low capital involvement; poor market drive; use of crude implements and human drudgery. The depth of poverty index was higher (P_1 = 0.2172) among farming households than among non-farming households (P_1 = 0.1451) (Appendix I). Non-farming households in North Central and South East had the highest (P_2 = 0.1743) and the lowest (P_2 = 0.0242) severity index respectively. However, among rural households whose primary occupation was farming, poverty severity index was highest (P2 = 0.1495) among those in North West (Appendix 3). The result indicates that engagement in farming activities as the primary means of livelihood tends more to deepen severity of poverty than non-farm activities do.

The result on Table 5 shows that the incidence of

poverty was higher among households whose heads were non-members of any local organization (P_0 = 0.5411) than those who were members (P_0 = 0.4800). Across the GPZs, the incidence of poverty was higher among households without access to social capital than those with it except in the South South and the North Central. Also, households whose heads were not members of any social organization in North West had highest incidence of poverty (P_0 = 0.7263) while the lowest incidence (P_0 = 0.2533) was found in South West among households whose heads were members of at least one social organization. This suggests that improved access to social capital is a viable poverty reduction strategy. Poverty gap was higher among households whose heads were non-members of social groups than among members representing P_1 = 0.2171 and 0.1828 respectively (Appendix 2). A similar trend was observed across the GPZs except in the North Central and South South where poverty gap was lower (P_1 = 0.2345 and P_1 = 0.1402 respectively) among households without social group membership than those with social organization membership (P_1 = 0.2620 and P_1 = 0.1537 respectively). The index of severity of poverty was highest (P_2 = 0.1527) in North West among non-members but lowest (P_2 = 0.0332) in South West among members of local institutions (Appendix 4). The result indicates that house-holds who were non-members of local organizations would require more resources to get out of poverty than households who belong to local organizations.

The result reveals that households whose heads had no formal education had the highest (P_0 = 0.5755) incidence of poverty while households with tertiary education

Table 5. Incidence of poverty (headcount ratio) and capital assets in rural Nigeria.

Household characteristics	Definitions	NC	NE	NW	SE	SS	SW	National
Social capital	Non-members	0.5372	0.6233	0.7263	0.2847	0.4019	0.2928	0.5411
	Members	0.5879	0.5899	0.6411	0.2778	0.4293	0.2533	0.4800
	No formal education	0.6237	0.6453	0.7518	0.2828	0.4679	0.2619	0.5755
	Elementary	0.6111	0.8125	0.5667	0.3846	0.4444	0.4286	0.5234
Education	Primary	0.5000	0.5000	0.4359	0.3060	0.4764	0.2703	0.4075
	Secondary	0.5386	0.5000	0.5378	0.2697	0.4063	0.3045	0.4116
	Tertiary	0.3660	0.2344	0.2759	0.2000	0.2170	0.1429	0.2577
	Non-formal	0.4146	0.6267	0.6401	0.3390	0.3448	0.1714	0.5668
Access to credit	No access	0.5743	0.6176	0.7056	0.2967	0.4273	0.2765	0.5159
	Have access	0.5399	0.5399	0.6440	0.1985	0.3679	0.2409	0.4615
Access to electricity	No access	0.5730	0.6171	0.7079	0.3234	0.4104	0.2723	0.5336
	Have access	0.5569	0.4681	0.4886	0.1853	0.4530	0.2622	0.3817

had the least incidence (P_0 = 0.2577). The result in Appendix 2 shows that households whose heads had no formal education had the highest (P_1 = 0.2345) poverty gap index while those with tertiary education had the least (P_1 = 0.1008). However, across the GPZs, the highest (P_1 = 0.3973) poverty gap index was found in North East among households whose heads had elementary education while the least (P_1 = 0.0561) was among households with tertiary education in South East. However, severity of poverty index (inequality in income distribution) among households whose heads were elementary school leavers (P_2 = 0.2237) and those with tertiary education (P_2 = 0.0254) in North East and South East were the highest and lowest respectively (Appendix 4). The results suggest that education reduces inequality in income distribution.

Table 5 further reveals that poverty headcount was higher (P_0 = 0.5159) among households without access to credit than those with access (P_0 = 0.4615). This suggests that incidence of poverty declines with access to credit. Across the GPZs, the incidence of poverty was highest (P_0 = 0.7056) in North West among households without access to credit but lowest (P_0 = 0.1985) in South East among households with access to credit. Similar to the result of headcount ratio, rural households in North West had the highest (P_1 = 0.2829) poverty gap while those with access to credit in South East had the least (P_1 = 0.0532) (see Appendix II). This implies that rural households without access to credit in North West will require five times the resources needed to get households with access to credit in South East out of poverty. Further, Appendix IV shows that severity of poverty index among households without access to credit was higher (P_2 = 0.1068) than among those with access (P_2 = 0.0853). This implies that the disparity in income distribution among households without access to credit

was higher than among those with access to credit. This trend was observed in all the GPZs except in North Central.

The result indicates that the incidence of poverty was higher (P_0 = 0.5336) among households without access to electricity than those with access (P_0 = 0.3817). This implies that about 53 per cent of the households without access to electricity and 38 per cent of those with access were poor.

Across the GPZs, the incidence of poverty was highest in North West (P_0 = 0.7079) among house-holds without access to electricity but lowest in South East (P_0 = 0.1853) among household with access to electricity. Further, Appendix II shows that the depth of poverty was deeper (P_1 = 0.2092) among households without access to electricity than households with access to electricity (P_1 = 0.1454). This implies that provision of rural infrastructure such as electricity is a sine-qua-non to rural poverty alleviation. As in poverty headcount, poverty gap was highest in North West (P_1 = 0.2871) among households without access to electricity, it was however lowest in South East (P_1 = 0.0481) among households with access to electricity. The index of severity of poverty was highest (P_2 = 0.1498) in North West without access to electricity but lowest (P_2 = 0.0190) in South East among members of local institutions (Appendix 4). Thus, income redistribution through provision of rural infrastructure helps to reduce inequality in income distribution among the poor and consequently reduce the poverty level.

Figures 1 in Table 6 suggest that North West had the highest incidence of rural poverty (P_0 = 0.6925). This was closely followed by the North East (P_0 =0.6069) and the North Central (P_0 = 0.5598). These zones contributed 29.5, 22.6 and 21% respectively to overall incidence of rural poverty. This indicates that together, the North West,
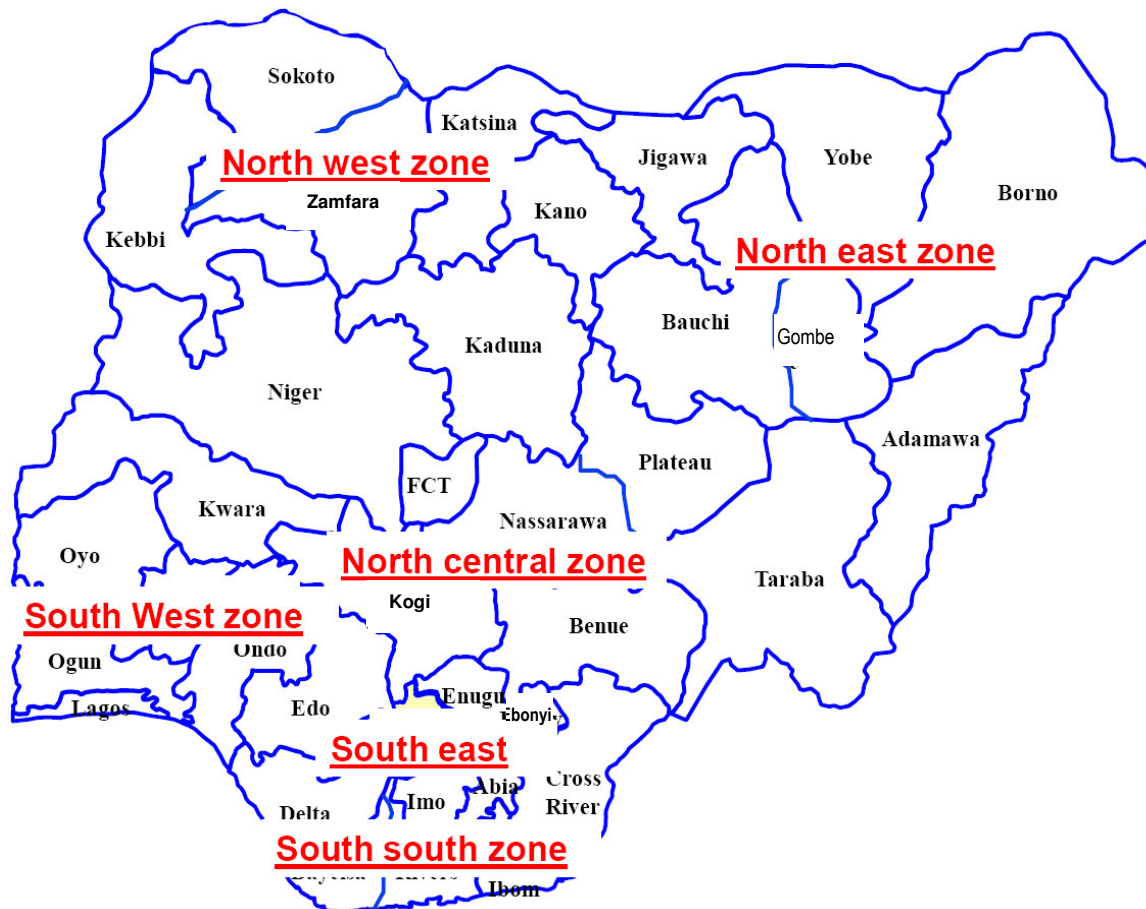
Figure 1. Map of Nigeria showing the six geopolitical zones.

North East and North Central contributed 73.1% to overall poverty incidence. This corroborates the findings of Minot et al. (2003) that poverty is more pronounced in remote and dry regions of Vietnam. Further, South West had the lowest incidence of poverty ($P_0 = 0.2699$) and the lowest relative contribution of 4.4% to overall poverty. This was followed by the South East with poverty incidence and relative contribution of 28 per cent and 8 per cent respectively. This shows that the proportion of the poor in North West is about thrice that of South West. The implication of this is that majority of the rural poor reside in the northern GPZs of Nigeria, which is a savannah belt. Thus, poverty may be as a result of returns to variations in natural assets and geo-climatic endowments.

As expected, rural poverty gap index was highest ($P_1 = 0.2781$) in North West and lowest ($P_1 = 0.0835$) in South West. This indicates that a typical poor rural household in the North West would require about thrice the amount of resources required by their counterparts in the South West to get out of poverty. This further confirms that the rural South West not only had the lowest proportion of the poor but also was more developed economically. Further,

the relative contribution of the zones to poverty in a descending order were 0.3030, 0.2390, 0.2295, 0.1229, 0.0709 and 0.0348 for North West, North Central, North East, South South, South East and South West respectively. This indicates the while the North West had the highest (30 per cent) contribution to depth of rural poverty in Nigeria, the South West had the least (3.5%).

The result further shows that North Central zone had the highest level of severity of rural poverty ($P_2 = 0.1454$), followed by the North West ($P_2 = 0.1446$) and North East ($P_2 = 0.1226$). This shows that although the North West had the highest proportion of the rural poor and required more investment of wealth to alleviate poverty, inequality in income distribution of households was highest in North Central. However, South West had the least ($P_2 = 0.0379$) severity of poverty index. This indicates that disparity in income distribution among the rural poor in North Central was about four times that of South West. Thus, South West consistently had the least values of all the poverty indices, indicating the least poverty levels (in terms of proportion of the poor, poverty gap and severity of poverty) among the GPZs. The North West had the highest absolute contribution of 0.302% to overall

Table 6. Spatial poverty profile in rural Nigeria.

States	Incidence		Depth		Severity	
	Estimate	Relative contribution	Estimate	Relative contribution	Estimate	Relative contribution
ALL	0.5053		0.1974		0.1030	
South South	0.4198	0.1353	0.1490	0.1229	0.0728	0.1150
Akwa Ibom	0.3755	0.0235	0.1198	0.0191	0.0584	0.0179
Bayelsa	0.2236	0.0145	0.0832	0.0138	0.0456	0.0144
Cross River	0.4943	0.0296	0.1775	0.0272	0.0847	0.0249
Delta	0.5362	0.0252	0.1913	0.0230	0.0906	0.0209
Edo	0.5297	0.0255	0.1930	0.0238	0.0918	0.0217
Rivers	0.4252	0.0170	0.1557	0.0160	0.0775	0.0152
South East	0.2803	0.0899	0.0864	0.0709	0.0389	0.0612
Abia	0.2500	0.0138	0.0753	0.0106	0.0317	0.0086
Anambra	0.2076	0.0134	0.0515	0.0085	0.0185	0.0058
Ebonyi	0.4506	0.0311	0.1598	0.0282	0.0798	0.0270
Enugu	0.2845	0.0188	0.0852	0.0144	0.0376	0.0122
Imo	0.1942	0.0128	0.0541	0.0091	0.0235	0.0076
South west	0.2699	0.0439	0.0835	0.0348	0.0379	0.0302
Ekiti	0.2891	0.0083	0.0793	0.0058	0.0312	0.0044
Lagos	0.8182	0.0037	0.4247	0.0049	0.2780	0.0061
Ogun	0.2735	0.0083	0.0700	0.0054	0.0266	0.0040
Ondo	0.3370	0.0166	0.1071	0.0135	0.0491	0.0119
Osun	0.1515	0.0041	0.0412	0.0028	0.0150	0.0020
Oyo	0.1265	0.0029	0.0379	0.0022	0.0169	0.0019
North Central	0.5598	0.2100	0.2489	0.2390	0.1454	0.2676
Benue	0.3957	0.0228	0.1204	0.0177	0.0525	0.0148
Kogi	0.8361	0.0556	0.4940	0.0841	0.3301	0.1078
Kwara	0.8842	0.0344	0.5322	0.0529	0.3629	0.0692
Nassarawa	0.4143	0.0254	0.1240	0.0194	0.0533	0.0160
Niger	0.5107	0.0326	0.1695	0.0277	0.0768	0.0241
Plateau	0.4651	0.0290	0.1787	0.0286	0.0918	0.0281
FCT	0.4144	0.0102	0.1345	0.0085	0.0631	0.0076
North East	0.6069	0.2261	0.2407	0.2295	0.1226	0.2240
Adamawa	0.6336	0.0401	0.2699	0.0437	0.1474	0.0457
Bauchi	0.7251	0.0507	0.2826	0.0506	0.1404	0.0482
Borno	0.5479	0.0250	0.1955	0.0228	0.0916	0.0205
Gombe	0.6536	0.0386	0.2575	0.0389	0.1282	0.0371
Taraba	0.4027	0.0282	0.1415	0.0254	0.0644	0.0221
Yobe	0.6730	0.0435	0.2907	0.0481	0.1589	0.0504
North West	0.6925	0.2948	0.2781	0.3030	0.1446	0.3019
Jigawa	0.8302	0.0593	0.3894	0.0712	0.2226	0.0780
Kaduna	0.4354	0.0211	0.1188	0.0148	0.0524	0.0125
Kano	0.5487	0.0254	0.1935	0.0229	0.0916	0.0208
Katsina	0.6099	0.0386	0.2217	0.0359	0.1035	0.0321
Kebbi	0.8024	0.0548	0.3251	0.0568	0.1676	0.0562
Sokoto	0.7530	0.0428	0.3249	0.0473	0.1738	0.0485
Zamfara	0.7428	0.0528	0.2977	0.0541	0.1544	0.0538

poverty severity in rural Nigeria. The lowest absolute contribution of 0.0031 came from the South West representing about 3 per cent relative contribution to overall poverty in rural Nigeria. Thus, North West contributed 10 times the contribution of South West to overall poverty severity in rural.

Conclusion and Recommendation

This study establishes that majority of the rural household heads are engaged in farming activities as the major source of income with attendant low income. Also, there is low level of access to capital assets in all the GPZs with the worst scenario in the Northeast and the North-west. Therefore, the framework for micro-finance policy and other micro-enterprises institutions should be reviewed to accommodate special consideration for the rural poor. This is expected to enhance increased access to credit in the rural areas where the majority of the poor reside. This will induce income growth through increased marginal productivity of the rural households. In addition, the incidence of poverty increases with household size. Thus, we recommend that all the three tiers of government should renew the campaign against large household sizes in order to enhance increase in per capita expenditure and consequently improved household welfare. This could be achieved through the establishment of a reproductive health services centre in all rural Local Government Areas of Nigeria.

The result shows that household in the savannah regions (northern zones) were the poorest. Thus, State and Local Government Authorities in the North Central, North West and North East should review past and current rural poverty alleviation policies in order to make amends and improve the execution of such policies. Policy should emphasize on increasing access to house-hold capital assets (human, financial, social and physical capitals) in these GPZs. Further, efforts need to be made by all tiers of government to encourage households to embrace smaller household sizes in order to enhance increase in PCE and consequently improve their welfare. This could be achieved through the establishment of a reproductive health services centre in all rural Local Government Areas (LGAs) of Nigeria.

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Appendix 1. Socio-economic dimension of poverty gap.

Household characteristics	Definitions	NC	NE	NW	SS	SE	SW	National
Gender	Female	0.3230	0.1522	0.1270	0.1227	0.0690	0.0434	0.1233
	Male	0.2438	0.2448	0.2794	0.1568	0.0937	0.0958	0.2097
	<20	0.2307	0.1033	0.1612	-	0.1302	-	0.1103
	20-29	0.1047	0.1395	0.1471	0.0832	0.0398	0.0481	0.1112
Age of household head	30-39	0.1997	0.2145	0.2558	0.1186	0.1005	0.1021	0.1932
	40-49	0.2737	0.2797	0.3080	0.1611	0.1075	0.0939	0.2302
	50-59	0.2997	0.3079	0.3040	0.1740	0.0923	0.0825	0.2179
	$\geq$60	0.3305	0.2397	0.2956	0.1685	0.0707	0.0786	0.1833
	1-5	0.2163	0.1642	0.2064	0.1098	0.0548	0.0627	0.1423
Household size	6-10	0.3113	0.3512	0.3438	0.2455	0.1527	0.2036	0.2892
	11-15	0.3458	0.4322	0.4544	0.2212	0.1893	0.2681	0.3858
	>15	0.3347	0.4085	0.4692	-	-	-	0.3893
Primary Occupation	Non-farm	0.2798	0.1535	0.1944	0.1135	0.0579	0.0770	0.1451
	Farming	0.2402	0.2544	0.2877	0.1842	0.0984	0.0877	0.2172

Appendix 2. Capita asset and poverty gap.

Household characteristics	Definitions	SS	SE	SW	NC	NE	NW	National
Social capital	Non-members	0.1402	0.0919	0.0939	0.2345	0.2681	0.2938	0.2171
	Members	0.1537	0.0833	0.0759	0.2620	0.2123	0.2544	0.1828
	No formal education	0.1685	0.0981	0.0829	0.2803	0.2584	0.3143	0.2345
	Elementary	0.1448	0.1288	0.2044	0.2938	0.3973	0.1806	0.2041
	Primary	0.1800	0.0914	0.0597	0.1938	0.2052	0.1609	0.1449
Education	Secondary	0.1413	0.0723	0.0894	0.2317	0.1787	0.1873	0.1458
	Tertiary	0.0873	0.0561	0.0600	0.1574	0.0733	0.1092	0.1008
	Non-formal	0.1117	0.1131	0.0628	0.1984	0.2682	0.2398	0.2206
Access to credit	No access	0.1551	0.0931	0.0880	0.2553	0.2490	0.2829	0.2032
	Have access	0.1070	0.0532	0.0633	0.2318	0.1883	0.2606	0.1708
Access to electricity	No access	0.1456	0.1038	0.0827	0.2480	0.2450	0.2871	0.2092
	Have access	0.1604	0.0481	0.0861	0.2672	0.1823	0.1586	0.1454

Appendix 3. Socio-economic dimension of poverty severity.

Household characteristics	Definitions	SS	SE	SW	NC	NE	NW	National
Gender	Female	0.0581	0.0319	0.0186	0.1994	0.0845	0.0520	0.0653
	Male	0.0771	0.0419	0.0438	0.1412	0.1244	0.1455	0.1093
	<20	-	0.1016	-	0.1191	0.0489	0.0643	0.0595
	20-29	0.0388	0.0141	0.0181	0.05114	0.0592	0.0686	0.0501
Age of household head	30-39	0.0574	0.0448	0.0472	0.1110	0.1051	0.1294	0.0981
	40-49	0.0801	0.0498	0.0447	0.1592	0.1448	0.1594	0.1212
	50-59	0.0849	0.0404	0.0348	0.1791	0.1652	0.1609	0.1151
	$\geq$60	0.0820	0.0320	0.0364	0.2038	0.1267	0.1611	0.0989

Appendix 3. Contd.

Household size	1-5	0.0513	0.0233	0.0265	0.1258	0.0740	0.0986	0.0703
	6-10	0.1262	0.0715	0.1014	0.1827	0.1909	0.1820	0.1553
	11-15	0.1079	0.0928	0.2086	0.2050	0.2548	0.2788	0.2289
	>15	-	-		0.1719	0.2134	0.2929	0.2223
Primary occupation	Non-farm	0.0533	0.0242	0.0371	0.1743	0.0713	0.1009	0.0776
	Farming	0.0922	0.0451	0.0384	0.1356	0.1306	0.1495	0.1127

Appendix 4. Capital asset and poverty severity.

Household capital assets	Definitions	SS	SE	SW	NC	NE	NW	
Social capital	Non-members	0.0682	0.0433	0.0444	0.1348	0.1434	0.1527	0.1142
	Members	0.0752	0.0364	0.0332	0.1542	0.1010	0.1322	0.0947
Education	No formal education	0.0840	0.0478	0.0376	0.1638	0.1323	0.1664	0.1246
	Elementary	0.0703	0.0574	0.1141	0.1704	0.2237	0.0957	0.1080
	Primary	0.0950	0.0390	0.0216	0.0976	0.1092	0.0804	0.0718
	Secondary	0.0673	0.0292	0.0393	0.1352	0.0845	0.0890	0.0727
	Tertiary	0.0433	0.0254	0.0355	0.0947	0.0314	0.0572	0.0552
	Non-formal	0.0500	0.0547	0.0319	0.1236	0.1435	0.1202	0.1140
Access to credit	No access	0.0769	0.0424	0.0406	0.1495	0.1283	0.1474	0.1068
	Have access	0.0441	0.0216	0.0259	0.1325	0.0867	0.1338	0.0853
Access to electricity	No access	0.0715	0.0480	0.0367	0.1426	0.1249	0.1498	0.1089
	Have access	0.0772	0.0190	0.0416	0.1643	0.0907	0.0747	0.0771