



AN ASSESSMENT OF VULNERABILITY TO POVERTY IN RURAL NIGERIA

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ABSTRACT

Poverty is a serious challenge in Nigeria especially in the rural area and it has been intractable because policies and programmes in the country are based on static poverty analysis. For effectiveness of policies and programmes on poverty, a forward looking approach-vulnerability to poverty, should be adopted. This study investigated the vulnerability to poverty across in rural Nigeria, using the 2004 NLSS data. The result of the 3-Stage Feasible Generalized Least Squares showed that at the standard vulnerability threshold of 0.5, 62.2% of rural households were vulnerable to poverty. Vulnerability to poverty was higher in northern zones and lower in the southern zones. Male headed households (59.8%) were more vulnerable to poverty than their female counterpart (43.9%). For every 100 households that were poor, 12 more will be poor in future in south, 11 more in households with heads without formal education, 8 more in farming households and 6 more in male headed households. Consumption variance index was consistently higher among non-farming households (0.0301), female headed households (0.0403) and those with primary education (0.0327). Mean consumption index was lower among farming households (0.0274), male headed households (0.0274), those with no formal education (0.0237) and those with household size greater than 20 (0.0168).

Keywords: poverty, vulnerability, rural Nigeria.

INTRODUCTION

Poverty remains a serious problem in sub-Saharan Africa. Its reduction in developing economy is the major challenge facing development stakeholders' today. The first UN Millennium Development Goal (MDG) agreed by world leaders in 2000, is the eradication of "extreme" poverty and hunger by 2015. In quantitative terms, the associated target for this MDG is the reduction by 50% of the proportion of people whose income is less than a \$1-a-day over the period 1990-2015.

According to Alayande and Alayande (2004), Nigeria suffers from high levels of poverty in spite of her enormous wealth of human and material resources. The 2004 Nigeria Living Standard Survey reports that 54.7% of the total population is poor, with 36.6% of the total population living in extreme poverty. There are marked differences in the incidence of poverty between urban and rural households. The NLSS 2004 survey has revealed that poverty in Nigeria is largely a rural phenomenon. It reveals a 20 percentage point gap between the poverty incidence of the urban and rural households. While 43 percent of urban households are poor, 63.8 percent of the rural households are poor. Further investigation of the poverty profile in the rural area reveals that about 44.4 percent cannot meet the food expenditure requirements while 19.38 percent of the households, although could meet the food expenditure requirements are unable to meet the minimum expenditure to cover other basic needs. In the case of the urban households, only 26.7 percent of the households that could not meet the required expenditure on food while 16.4 percent of the households are moderately poor since they could meet food expenditure but not other non-food basic needs expenditure.

The starting point in a dynamic conceptualization of poverty is the recognition that the welfare of households

is not simply dependent upon their income or consumption in any given period but also on their exposure to risk. During the last few years the increasing recognition that there are considerable flows into and out of the poverty pool (Baulch and Hoddinott, 2000) has focused interest in household vulnerability as the basis for a social protection strategy. While it has long been demonstrated (Rosenzweig and Binswanger, 1993; Banerjee and Newman, 1994) that considerations of risk and uncertainty are key to understanding the dynamics leading to and perpetuating poverty, it is only recently that policy makers have taken a more active interest in trying to incorporate considerations of risk and vulnerability into their strategies to reduce poverty. This concern with risk and vulnerability among policy makers is echoed by findings from the worldwide consultations of the poor which reveal that risk and uncertainty often preoccupy their life and lie at the core of their poverty. Households face a lot of risks and they often experience shocks leading to a wide variability in their consumption. To reduce poverty sustainably, however, reducing household vulnerability and increasing household resilience are necessary.

Vulnerability is a forward-looking ex-ante measure of household's well-being which shows that a household whether or not is poor today, will find itself poor tomorrow (Chaudhuri, 2001). In another dimension today's poor may or may not be tomorrow's poor. Currently non-poor households, who face a high probability of a large adverse shock, may, on experiencing the shock, become poor tomorrow. And the currently poor households may include some who are only transitorily poor as well as others who will continue to be poor (or poorer) in the future. This definition was adopted for this study.



Vulnerability is desirable therefore to have a measure of household welfare which takes into account both average expenditures and the risk that households bear. Vulnerability assessments facilitate in designing better risk-management and anti-poverty policies by highlighting the distinction between ex-ante poverty prevention interventions and ex-post poverty alleviation interventions.

Vulnerability is a major obstacle to social and economic development. Poor people are especially vulnerable; they have few buffers or resources to cope with hazards or shocks. Yet they are significantly more likely to be affected by ill-health, unemployment, trade shocks, climate change, famine or conflict. Sustainable poverty reduction can only be achieved and managed effectively if vulnerability is better understood. Nigerians especially those living in rural areas are prone to hazards or shocks because rural infrastructure in Nigeria has long been neglected, while investments in health, education and water supply have largely been focused on the cities. As a result, the rural population has very limited access to services such as schools and health centres, and about half of the population lacks access to safe drinking water. Limited education opportunities and poor health perpetuate the poverty cycle. The neglect of rural infrastructure has also reduced the profitability of producing for the markets. Nigeria's rural road network is one of the least developed in sub-Saharan Africa (IFAD, 2007). The poor tend to live in isolated villages that can become virtually inaccessible during the rainy seasons. During the periods of post - harvest marketable surplus, it is not always easy to reach the markets.

The large total land area of 923, 773Km² notwithstanding, Nigeria is bedeviled with major environmental hazards that have adversely affected the earning capacity of the people especially in the rural areas. The major environmental problems that have made Nigerian especially the rural dwellers vulnerable to poverty are:

- drought and desertification due to population pressure, over-grazing and continuous exploitation of marginal lands;
- agricultural land degradation which has affected all the 36 states of the federation in an effort to increase agricultural production to meet the demand of the growing population;
- the high incidence of gully, coastal and marine erosion are most noticeable in the south-south, south east and south-western parts of the country. There is also flooding (coastal river and urban) which has become a national issue.
- Large industrial pollution and urban waste management are other environmental problems that have seriously affected the health of the people and hence their income earning capacity.

The current economic meltdown/global recession that started in 2008 is likely to subject Nigerian

households and organisations to price and economic shocks. This may adversely affect consumption, thus leading to more people falling into poverty or become vulnerable to poverty. Already, the economic recession has ignited a chain of reactions in the nation's economy. There has been massive retrenchment especially in the banking sector due to the collapse of some banks. Government has had to increase pump price of petroleum products and the capital market is melting down.

Government at all levels, have embarked on several programs in order to alleviate the incidence and severity of poverty in Nigeria. Some of such programs include National Directorate of Employment (NDE), the Family Support Program (FSP), the National Agricultural Land Development Authority (NALDA), the Directorate for Food, Roads, and Rural Infrastructure (DFRRI), Family Economic Advancement Program (FEAP) and National Poverty Eradication Program (NAPEP) (Osinubi, 2003). These programmes, approaches and strategies are aimed at improving the conditions of the rural poor, while some of the efforts are still on course, many have since gone moribund (Nwachukwu and Ezeh, 2007). The failure of these previous programmes and strategies to slow down the incidence of poverty in Nigeria bears a strong testimony to one major issue. The country should pay more attention to the issue of risk and uncertainty that are important for the understanding of the dynamics leading to and perpetuating poverty. Given the importance of risk and uncertainty, policy makers are beginning to incorporate risk and vulnerability into their strategies to reduce poverty (Alayande and Alayande, 2004).

The 2004 National Living Standard Survey (NLSS) data was used for the purpose of this study. Due to high incidence of poverty in the rural area in Nigeria and the fact that poverty studies have over the years used static rather than dynamic concept in its analysis. Recent literature has observed (static) poverty status might not be a good indicator of the household's general poverty risk (its vulnerability to poverty). Thus, recent literature has emphasized the need for poverty to be considered a forward looking approach-vulnerability to poverty. However empirical evidence of vulnerability is scarce in Nigeria, therefore, the vulnerability to poverty in Nigeria was investigated. The specific objective of this paper is to present the vulnerability to poverty profile of rural Nigeria.

Theoretical framework for vulnerability

Hoddinott and Quisumbing (2003) identified three approaches to assessing vulnerability. These are vulnerability as expected poverty (VEP), vulnerability as low expected utility (VEU) and vulnerability as uninsured exposure to risk (VER). According to the authors, these three approaches share a common characteristic since each of them constructs a model that predicts a measure of welfare. Further VEP and VEU shares two characteristics viz: they make reference to benchmark for the welfare indicator and enunciate a probability of falling below this benchmark. VEP and VEU approaches measure



vulnerability at individual level, summing over all individuals or households give a measure of aggregate vulnerability. However, VER according to Hoddinott and Quisumbing does not measure vulnerability because it does not construct probabilities. Instead, VER assesses whether observed shocks generate welfare losses.

VEP approach has advantage in terms of its capability to identify households "at risks" who are not poor and the fact that it can be estimated with single cross-sectional data, this study adopts the VEP approach as its theoretical framework. This becomes imperative since only cross sectional data are presently available in Nigeria to carry out welfare studies.

Following the exposition by Dercon (2001), the starting point for VEP is to consider the vulnerability of particular household h at time t as the probability that the household will find itself consumption poor at time $t+1$:

$$V_{ht} = \Pr(c_{h,t+1} = z) \quad (1)$$

Where $c_{h,t+1}$ is the household's consumption level at $t+1$ and z is the poverty line.

In situation where cross-section data are available, deriving a consumption prediction model is considered in general as:

$$c_{ht} = c(X_{h,t}, I_{h,t}, \delta, \alpha, \varepsilon_{ht}) \quad (2)$$

Where X_h is a vector of observable household characteristics, I_h is a vector of risk management instruments, δ is a vector of parameters describing the state of the economy at time t , α are unobserved but fixed household characteristics and ε stochastic errors. To derive the vulnerability measure at the household level, substituting (2) in (1) gives:

$$V_{ht} = \Pr(c_{h,t+1} = z | X_{h,t}, I_{h,t}, \delta, \alpha, \varepsilon_{ht}) = z | X_{h,t}, I_{h,t}, \delta, \alpha, \varepsilon_{ht}$$

In words, the estimated probability of being poor in period $t+1$ using the prediction model (1), based on information available in period t , but including (possibly predicted) information about δ and ε .

The crucial elements in this specification are δ_{t+1} and ε_{ht+1} . Both variables are indexes and therefore include information about evolving state of the aggregate economy (constant across households) and aggregate shocks. Typically, and in Chaudhuri *et al.*, (2001), there is no information on δ_{t+1} within the data and so ignored, while similarly time dependence of errors and shocks ε_{ht+1} is allowed for. In short, the risk and the vulnerability to poverty considered are only idiosyncratic-i.e., no aggregate shocks are allowed for. In order to address this problem, Dercon (2001) suggests the use of additional

independent variables to the ones suggested in the Chaudhuri approach.

Using a useful characteristic of this linear model and from the normality assumption of the errors, and defining Φ as the standard normal distribution, household vulnerability is estimated as:

$$\Pr_{h=1}^{n_h} \ln c_{h,t+1} < \ln z | X_{h,t} = \Phi \ln z . X_{h,t} \delta / X_{h,t} \delta \quad (3)$$

The step by step method of analysis is as explained in the methodology. The FGLS approach is therefore used in assessing the vulnerability of households to poverty.

METHODOLOGY (Data source and analytical technique)

The study used merged data from the National Living Standard Survey (NLSS) and NBS Annual Abstract of Statistics for the same year 2004. The National Living Standard Survey (2004) of households that was carried out between September 2003 and August 2004. The sample design used was the two-staged stratified sampling. The first stage involves the Enumeration Areas (EAs), while Housing Units constitute the 2nd stage. Clusters of 120 housing units called Enumeration Areas (EA) were randomly selected per state. The second stage involved random selection of 5 housing units from the selected EAs. A total of 600 households were randomly selected from each state and 300 from the FCT, summing up to 21,900 households in all. However data available for the rural areas was 14,512 households. Data on consumption, expenditure, demographic characteristics, education attainment, type of housing unit available, membership of any social organization and other socio-economic characteristic will be got from NLSS. While state specific covariate data like price level, unemployment rate, volatility of government expenditure, rainfall, sunshine, radiation, reported cases of armed robbery, reported cases of AIDS, malaria, measles, river blindness and was taken from NBS Annual Abstract of Statistics.

Analytical technique

Determinants of rural household consumption

Following Chaudhuri (2000) the step by step method of FGLS approach is explained below.

Suppose that a household's h consumption in period t is determined by a set of variables X_h . We can hence set up the equation:

$$\ln C_h = X_h \beta + e_h \quad (4)$$

where $\ln C_h$ is the log of per capita household consumption, X_h a set of household as well as community characteristics, and e_h the part of households' consumption that cannot be explained. Chaudhuri, Jalan and Suryahadi (2002) suggest that this error term, or the variance in consumption of otherwise equal households, captures the impact of both



idiosyncratic and community specific covariate shocks on households' consumption and that this variance is correlated with observable household and community characteristics. In a second step, the variance of the error term was therefore regressed on the same (and other) household and community characteristics.

$$\sigma^2_{e,h} = X_h \theta = \sum_i \sum_{j>i} X_h^i X_h \theta_{ij} \quad (5)$$

Standard regression analysis using ordinary least squares (OLS) estimation techniques assume homoscedasticity, i.e., the same variance $V(e_i) = \sigma^2$ across all households i . Chaudhuri (2000) assumes that the variance of the error term is not equal across households, reflecting the impact of shocks on consumption; i.e., the error term is assumed to be heteroscedastic. Using OLS for an estimation of β and θ led to unbiased but inefficient coefficients.

Following Amemiya (1977), the parameters of β and θ are estimated by using a three-stage feasible generalized least square (FGLS) procedure. In the first stage, equation (4) was estimated with ordinary least square (OLS) method and the square of the generated error term are to be regressed against the explanatory variable in equation (6) below.

$$\hat{\epsilon}^2_{OLS,h} = X_h \theta + \eta_h \quad (6)$$

The predicted value of the error term in equation (6) was used to transform the same equation in a manner specified below:

$$\frac{\hat{\epsilon}^2_{OLS,h}}{X_h \theta_{OLS}} = \left[\frac{X_h}{X_h \theta_{OLS}} \right] \theta + \left[\frac{\eta_h}{X_h \theta_{OLS}} \right] \quad (7)$$

Equation (5) was estimated using OLS method to obtain an asymptotically efficient FGLS estimate denoted as θ_{FGLS} . In this case, $X_h \theta_{FGLS}$ is a consistent estimate of $\sigma^2 e_h$, the variance of the idiosyncratic component of households' consumption expenditures. Therefore equation (5) was transformed with

$$\hat{\sigma}_{e,h} = \sqrt{X_h \theta_{FGLS}} \quad (8)$$

To obtain

$$\frac{\ln C_h}{\sqrt{X_h \theta_{FGLS}}} = \frac{X_h \beta}{\sqrt{X_h \theta_{FGLS}}} = \frac{e_h}{\sqrt{X_h \theta_{FGLS}}} \quad (9)$$

Equation (10) was estimated using OLS method, and it yields a consistent and asymptotically efficient β . For each household the expected mean as well as variance of consumption can be estimated using the consistent and asymptotically efficient estimator's β_{FGLS} and θ_{FGLS} .

$$\hat{E}[\ln c_h X_h] = X_h \hat{\beta} \quad (10)$$

$$\hat{V}[\ln c_h X_h] = \hat{\sigma}^2_{e,h} = X_h \hat{\theta} \quad (11)$$

The vulnerability level of h household which is the probability that household h with characteristics X will be poor in the future can be estimated by assuming that households' consumption expenditure are log normally distributed. Letting $\Phi(\cdot)$ denote the cumulative density of the standard normal distribution, the estimated vulnerability probability is given by:

$$\hat{v}_h = \hat{Pr}\left(\ln C_h < \frac{\ln z}{X_h}\right) = \Phi\left[\frac{\ln z - X_h \hat{\beta}}{\sqrt{X_h \hat{\theta}}}\right] \quad (12)$$

where

c_h = Consumption level of household h

X_h = Vector of independent variables including household demographic composition and human capital

β = Regression coefficients of idiosyncratic variables

$\sigma_{e,h}$ = Variance of idiosyncratic and covariate variables

e_h = Error term

The independent variables are as follows:

Ageyears	= Age of household head
Ageyearsq	= Age squared (years)
Sex	= Sex of household head (1=Male, 0=
otherwise)	
Hhsize	= Household size
Ss	= South south
Se	= South east
Sw	= South west
Ne	= North east
Nw	= North west
Occ	= Occupation (farming=1, 0= otherwise)
Pri	= Primary education of the household
head (Yes = 1, 0 = otherwise)	
Secon	= Secondary education of household
head (Yes = 1, 0 = otherwise)	
Tert	= Tertiary education of household head
(Yes = 1, 0 = otherwise)	
Hytoilet	= Hygienic toilet (Yes = 1, 0 =
otherwise)	
Modernwall	= modern wall (Yes = 1, 0 = otherwise)
Safewater	= Safe drinking water (Yes = 1, 0 =
otherwise)	
Occs	= House ownership) (Yes = 1, 0 =
otherwise	
reason 2	= (Yes = 1, 0 = otherwise)
reason 3	= (Yes = 1, 0 = otherwise)
reason 4	= (Yes = 1, 0 = otherwise)
reason 5	= (Yes = 1, 0 = otherwise)



reason 6	= (Yes = 1, 0 = otherwise)
reason 7	= (Yes = 1, 0 = otherwise)
Unemploy	= Unemployment rate
Rain	= Amount of rainfall
Aids	= Reported number of AIDS cases
Malaria	= Reported number of malaria cases
Rivblind	= Reported number of river blindness cases
Tempera	= Temperature
Humidity	= Humidity
Arrob	= Reported armed robbery cases
Memberco	= Membership of local group/association (Yes = 1, 0 = otherwise)
Credit	= Access to credit (Yes = 1, 0 = otherwise)
Electricity	= Access to electricity (Yes = 1, 0 = otherwise)
Farmsize	= Farm size (hectares)
Singleroom	= dwell in singleroom (Yes = 1, 0 = otherwise)
Apart	= dwell in apartment (Yes = 1, 0 = otherwise)
Duplex	= dwell in duplex (Yes = 1, 0 = otherwise)
Wbuilding	= dwell in whole building (Yes = 1, 0 = otherwise)

* The regression for 3FGLS used the reasons given by respondents for being poor, the reasons that the highest percentage were classified into Reasons 1, 2, 3, 4, 5, 6, and 7. reason 1 represents: high agricultural inputs price, reason 2 represents: lack of agric input, reason 3 represents: low agricultural production, reason 4 represents: low agricultural prices, reason 5 represents: agricultural capital problem, reason 6 represents: no capital to expand own business and reason 7 represents: hard economic times.

Decomposition of vulnerability sources

In order to inform policy, following the literature of (e.g. Bidani and Richter, 2001; Alayande and Alayande ,2004; Oni and Yusuf, 2007), the pool of vulnerable households divided into two mutually exclusive groups namely (i) those who are vulnerable due to the high volatility of their consumption and (ii) those who are vulnerable due to their low expected mean consumption. The objective to decompose sources of vulnerability to poverty was achieved by adopting equation 13. First chose a reference household with an associated bundle of characteristics, X^r . The vulnerability of other households was then assessed relative to this reference household. The difference between the vulnerability level of a household with characteristics X^h and that of the reference household was decomposed as follows:

$$\hat{v}_h - \hat{v}_r = v(\hat{\mu}_h^c, \hat{\sigma}_h^c) - v(\hat{\mu}_r^c, \hat{\sigma}_r^c)$$

$$\begin{aligned} & [v(\hat{\mu}_h^c, \hat{\sigma}_h^c) - v(\hat{\mu}_r^c, \hat{\sigma}_h^c)] \\ & [v(\hat{\mu}_h^c) - v(\hat{\mu}_r^c, \hat{\sigma}_r^c)] \end{aligned} \quad (13)$$

This decomposition exercise is useful because it can be explained as follows. If two groups in the population are estimated to be equally vulnerable relative to the reference household, but in one case it is due to low levels of mean consumption, and in the other because of high consumption variance. The appropriate policies for mitigating the vulnerability of these two groups will in general differ and it will therefore be important, for policy purposes, to be able to discriminate between the different sources of vulnerability.

As in previous studies that have used this methodology, there was no issue of endogeneity. However, this is not being ruled out. Hence, an appropriate diagnostic test of endogeneity and corrections was carried out.

RESULTS AND DISCUSSIONS

Table-1 reveals that the mean age in the study area is 47.8 ± 14.5 years. Most of the household head fell between 40 to 49 years of age, closely followed by 60 years and above, with a percentage of 23.02, which mean a lot of the elderly live in the rural areas. The household heads between 30 to 39 years are the third largest group (22.81 percent). It is clear from the distribution that the bulk of the people in the study area are in their active years.

The mean household size was 5.0 ± 2.9 . The least family size is one while the largest is twenty two. The result shows that household size in Nigeria is still relatively large in rural areas. They constitute household labour since they are predominantly farmers. The family members are needed in farming especially in operations like planting, weeding, harvesting and marketing. Household size is factor affecting the level of poverty incidence, depth and severity in rural farming households in Kogi State (Omonona, 2001)

Most of the household heads in the rural areas were males, while a few were headed by females. The percentage of male household heads was 86.49 percent, while their female counterpart was only 13.51 percent, a ratio of 1: 6.

The housing unit type was classified based on whether they are single rooms, flats apartments, duplex, whole building and others. From Table-1, the respondents with single rooms were 9, 573. Similarly, those with whole building were 4, 296. Those living in apartment or flat were 372. The respondents living in Duplex were the fewest 63 while those living in other types of housing units were 208. Sixty six percent (66%) of household members live in single rooms; an average family in the study area had five members. Living in a single room may have implications for the health status of household members.

Asset is a key factor in reducing poverty. According to this data 86.11 percent of the households



own the houses they live in, it is either owned by the husband or his spouse or by both husband and spouse and only 13.86 percent live in rented houses. This factor did not seem to have an effect on the poverty status of the respondents

Human capital development is very important for poverty reduction. Education was classified into non-formal education, primary school education, secondary education and tertiary education. More than half of the household heads in rural Nigeria have no formal education. Those with no formal education are 52.89 percent followed by those with secondary education 29.87 percent, 5.38 percent have primary education 3.34 percent have tertiary education and 8.51 percent have other types of education. Inadequate resource of human capital is a major cause of poverty which is evident in this study, with more than half of the respondents not having any formal education. Poverty decreases as the level of education increases (Omonona, 2001; World Bank, 2000). There were various types of occupation in the rural areas. Of these occupations agriculture was still the main occupation of most rural households in Nigeria. Agriculture and forestry accounted for 76.7 percent of the occupation groups in the rural areas, followed by sales accounted for just 5.48 percent. The data shows that 84.14 percent of the household heads were member of one or more associations in their communities, while only 15.86 percent were not members of any association. It is however instructive to know that 79 out of 100 of respondents in the rural areas had access to credit outside the home, while 21 out of 100 had no access to credit outside the home.

Household's hygienic condition is defined as bad if a household does not have sanitary latrine and safe drinking water. Safe drinking water is available to very few households in the rural areas. Six out of 100 respondents had access to pipe borne water, sixteen out of 100 respondents use borehole, while the others use low quality sources of water, sources such as unprotected wells, rainwater, river, lakes or ponds. Also sources like vendors or water trucks. The types of toilets available in the rural areas are unhygienic this might lead to health hazard which might affect the whole community. 11.45 percent of the respondents had no toilet, 42.85 percent had covered pit latrine, 15.12 percent had uncovered pit latrine, 3.96 percent use pail or buckets, only 1.69 percent use VIP latrine, flush to sewer and septic were 1.04 and 1.12 percent respectively. Bad hygiene has implications for the health status of household members, rendering them vulnerable to health hazards.

Respondents connected to electricity from the national grid were only 17.42 percent; others use other sources of lighting. On housing conditions and facilities, 70 out of 100 respondents live in houses whose outside wall were made of mud, wood or bamboo, iron sheet and cardboard. Only 30 out of 100 of them had concrete, burnt bricks and stones as their outside walls. The mean per capita expenditure was ₦37, 767.97 per annum. This is an indication of very poor condition of living as it conforms to an income of less than \$1 per day which is the widely

accepted threshold of poverty below which an individual will be considered poor.

The mean unemployment rate in rural Nigeria is 13.90 ± 9.72 percent. The amount of rainfall is an important factor in the rural areas since agriculture is rain fed in most parts of Nigeria. The mean rainfall in Nigeria is 84.96 ± 62.00 mm. Temperature and humidity in the nation will also affect agriculture. Diseases that affect Nigerians can be key to making non vulnerable Nigerians vulnerable to poverty in the future. Diseases like HIV/AIDS, malaria and river blindness. The mean HIV/AIDS cases in Nigeria are 91551.37 ± 36080.83 and this is very alarming. Also the mean reported cases of malaria are 3799.35 ± 6103.83 .

Table-1. Selected characteristics of respondents.

Variables	Frequency	Percent
Gender		
Male	12, 552	86.49
Female	1, 960	13.51
	14, 512	100.00
AGEGR10		
10 to 19 years	37	0.25
20 to 29 years	1, 204	8.54
30 to 39 years	3, 310	22.81
40 to 49 years	3, 690	25.43
50 to 59 years	2, 894	19.94
60 and above	3, 341	23.02
		100.00
Household size		
1-5	9, 445	65.08
6-10	4, 399	30.3
11-15	641	4.43
16-20	27	0.19
	14,512	100.00
Educational status		
No formal education	7, 676	52.89
Elementary	128	0.88
Primary	653	4.50
Secondary	4, 335	29.87
Tertiary	485	3.34
Other	1, 235	8.51
	14, 512	100.00
Occupational status		
Farming		
Non Farming		



Types of dwelling		
Single room	9, 573	65.97
Apartment or flat	372	2.56
Duplex	63	0.43
Whole building	4, 296	29.60
Others	208	1.43
	14, 512	100.00
Source of water		
Pipe borne	853	5.88
Untreated pipe	305	2.10
Borehole/hand pump	2, 347	16.17
Protected well	2, 423	16.70
Unprotected well or rainwater	3, 491	24.06
River, lakes or pond	4, 321	29.78
Vendor or water truck	323	2.23
Others	449	3.09
	14, 512	100
Credit		
Access to credit	8, 698	79.2
No access to credit	2, 303	20.8
	11, 001	100
Main source of lighting		
Kerosine	10, 982	75.68
Gas	162	1.12
Main electricity	2, 528	17.42
Electric generator	73	0.50
Battery	9	0.06
Candle	20	0.14
Firewood	552	3.80
Others	186	1.28
	14, 512	100
Types of toilet		
None	1, 661	11.45
Toilet on water	708	4.88
Flush to sewer	151	1.04
Flush to septic	162	1.12
Pail or bucket	574	3.96
Covered pit latrine	6, 219	42.85

Uncovered pit latrine	2, 194	15.12
VIP latrine	245	1.69
Others	2, 598	17.90
Total	14, 512	100
Ownership status		
House owned by household	12,497	86.11
House not owned by household	2, 015	13.89
Total	14, 512	100
Membership of association		
Yes	12, 211	84.14
No	2, 301	15.86
Total	14, 512	100
Material of outside wall		
Mud	9, 043	62.31
Stone	84	0.58
Burnt bricks	223	1.54
Cement or concrete	4, 052	27.92
Wood or bamboo	133	0.92
Iron sheet	71	0.49
Cardboard	37	0.25
Others	869	5.99
Total	14, 512	100
Occupation groups		
Student, retired, unemployed/inact	559	3.85
Professional or technical	650	4.48
Administration	13	0.09
Clerical	419	2.89
Sales and related	795	5.48
Services and related	325	2.24
Agricultural and forestry	11, 131	76.70
Production and transport	197	1.36
Manufacturing and processing	123	0.85
Others	300	2.07
Total	14, 512	100

**Table-2.** Descriptive statistics of selected covariate variables.

Variables	Mean	Standard deviation	Definitions
Covariates			
Unemploy (%)	13.906	9.7214	Unemployment rate
Rain (mm)	84.968	62.008	Rainfall
Aids	91551.37	36080.83	HIV/AIDS (in number)
malaria	3799.35	6103.83	Reported malaria cases(number)
rivblind	1263.3	1724.20	River blindness (number)
tempera	24.595	20.67	Temperature (°C)
humidity	36.606	26.34	Humidity
armrob	80.85	51.60	Reported armed robbery cases

DETERMINANTS OF RURAL HOUSEHOLD CONSUMPTION

Table-3 presents the regression results for vulnerability estimations for NLSS (2004) and NBS Annual Abstract of statistics (2004). The results for log mean per capita consumption expenditure (MPCE) was later used to assess the vulnerability to poverty of households. The results show good performance of the model, with F value being statistically significant. The adjusted coefficient of determination shows that 57.12 percent of the variations in the values of log consumption expenditure was accounted for or explained by the explanatory variables used.

The age of the household head is negative and significant to explain per capita household consumption while the age squared a positive association with log per capita consumption. As expected a large household size will reduce per capita consumption. It is well known that families with many children are on the average poorer. Sex dummy of male headed household showed positive significance to log per capita consumption.

Higher levels of educational attainment are positively and significantly associated with higher per capita consumption. No formal education and primary education dummies had negative signs. Secondary and tertiary dummies on education are found to affect consumption per capita positively. The relevant coefficients are all statistically significant as well. This basically conforms to other studies concluding that literacy and education attainment decrease poverty (e.g. World Bank, 2002).

Access to electricity and availability of safe drinking water were found to affect per capita consumption positively. Whether households participate in social safety net programmes or not is very important. Those households that had access to credit outside their home and those who belong to one or more associations affected consumption per capita negatively and were not significant. The main occupation in rural Nigeria was farming. Household-heads engaged in farming activities were negatively associated with log per capita consumption. Due to weather variations and other environmental factors affecting agricultural production (especially if permanent irrigation is not available), their

income fluctuates from one season to another and this is likely to affect future consumption in the rural areas.

While the variables other than housing conditions seem to be natural candidates for inclusion in the regression (Suryahadi and Sumarto, 2003), housing condition defined by the type of the construction materials used in building houses, is included in the model as this is thought to be a major and quite regular source of shocks for rural households. When there is a heavy rainfall, flooding and storm, which is fairly common in Nigeria, households particularly in rural areas need to spend a significant amount of resources for the repair and reconstruction of their houses. Construction material such as mud, wood or bamboo, iron sheet common in the rural areas are considered not modern. The use of modern material like cement, burnt bricks and stone in construction of outside wall of houses in the rural areas affected per capital consumption positively. Of all the types of dwellings, single room and whole building was the only significant dwelling. Whole building was positively associated with consumption per capita while single room was negatively associated with consumption per capita.

A few results are surprisingly contrary to a prior expectation. For example the dummy variable for house ownership and farm ownership were not significant. One would have expected that what the household heads considered as reasons for being poor, if significant, would have a negative effect on consumption. All the reasons that were significant had positive signs. The coefficient estimate for AIDS was significant and had a positive sign. This means that consumption will increase as AIDS cases increases. This might be due to the special diet people living AIDS will have to consume and might be because of well organized AIDS programme in Nigeria which reduces the progression of HIV infection to full blown AIDS. Malaria and river blindness (health hazards) as expected were found to affect per capita consumption negatively. Other covariate variables like rainfall and temperature affects consumption per capita positively. This is expected since agriculture in Nigeria is rain fed. Unemployment rate and armed robbery cases were negatively associated with consumption per capita.

**Table-3.** Last stage of the 3FGLS estimates.

Variable	Coefficient	Std Err.	t	P>(t)
Ageyears	-.0091082	.002273	-4.01	0.000***
ageyearsq	.0001096	.0000216	5.07	0.000***
Sex	.0993339	.0170943	5.81	0.000***
Hysize	-.089125	.0021599	-41.26	0.000***
Ss	.263703	.0210322	12.54	0.000***
Se	.4872546	.0225974	21.56	0.000***
Sw	.1890957	.0252004	7.50	0.000***
Ne	.144737	.0211054	6.86	0.000***
Nw	.3571821	.0217412	16.43	0.000***
Occ	-.1641345	.0130198	-12.61	0.000***
Noedu	-.16071	.0220478	-7.29	0.000***
Pri	-.0625954	.0316733	-1.98	0.048**
Secon	.0671281	.0262219	2.56	0.045**
Tert	.3857917	.0308326	12.51	0.000***
hytoilet	.0628442	.0512423	-1.23	0.220
modernwall	.1488824	.073793	2.02	0.044**
Occs	.0066849	.0145266	0.46	0.645
Reason2	.0330573	.0211287	1.56	0.118
Reason3	.0227484	.0210199	1.08	0.279
Reason4	-.0244963	.0294989	-0.83	0.406
Reason5	0.237191	.0212721	1.12	0.265
Reason6	-.0087654	.0279345	-0.31	0.754
Reason7	.0449101	.03341	1.34	0.179
Unemploy	-.0108074	.0007368	-14.67	0.000***
Rain	.0003626	.000192	1.89	0.059*
Aids	3.46e-06	1.92e-07	18.08	0.000***
Malaria	-5.76e-06	1.08e-06	-5.31	0.000***
Rivblind	-.0000145	3.99e-06	-3.64	0.000***
Tempera	.0015246	.0006375	2.39	0.017**
Humidity	-.0028036	.0004623	-6.06	0.000***
Armrob	-.0006003	.0001349	-4.45	0.000***
Memberco	.018038	.0161437	1.12	0.264
Credit	.0041931	.0138399	0.30	0.762
Electricity	.0267325	.0158765	1.68	0.092*
Farmsize	.0000812	.0000551	1.47	0.141
Singleroom	-.1074091	.0440999	-2.44	0.015**
Apart	-.051213	.0537906	0.95	0.341
Duplex	-.0195004	.0989924	-0.20	0.844
Wbuilding	.076224	.0445784	1.71	0.087*
Cons	10.36616	.0828305	125.15	0.000***

***significant at 1% **significant at 5%

*significant at 10%

Observations 14512 R Squared = 5730

Adj R Squared = 5712

Joint significance F () = Prob> F = 0.000



Vulnerability/observed poverty profile

A vulnerability profile by selected household characteristics can be seen on Table-4. The results from the table show that poverty and vulnerability varied across demographic, occupational and socio-economic characteristics. The predicted/ observed poverty ratio was used to estimate the expected poverty incidence based on the static poverty estimate.

At a standard vulnerability threshold of 0.5, 62.2% of rural households in Nigeria were vulnerable to poverty. Also at the geo-political zones, poverty is expected to decline in all zones except south. The predicted/observed poverty ratios for both zones were 1.12. This means that for south zone for every 100 household head within this zone that are poor now, 12 more are expected to be poor in future.

The level of education and literacy of head of household are an important determinant of vulnerability (as well as poverty). As evident from the Table-4, educational attainment significantly affects the incidence of vulnerability. For instance, 47.7 percent of the population is vulnerable in households where the head of the household has secondary education, 23.6 percent where the head of the household has tertiary education. This is against a 69.1 percent incidence in case head of household with no formal education.

An assessment of gender of household head, poverty and vulnerability shows that male-headed households had higher poverty incidence than the female-headed households. Indeed, the male-headed households have a poverty incidence of 58.2% as against the female-headed households that have an incidence level of 43.8%. The male-headed households also contribute more to expected poverty than their female-headed counterparts. This is estimated at 59.8% and 43.9%, respectively for male-headed and female-headed households respectively. Jha and Dang (2008) found for a group of selected countries in Central Asia (Azerbaijan, Kazakhstan, Kyrgyzstan, and Tajikistan) that female-headed households were much less vulnerable than their male counterparts.

Household heads that derive income principally from agriculture and forestry also show higher incidence of poverty compared to non-farm worker. Expected poverty for farm workers is 66.9 per cent compared to roughly 40.9 per cent for non-farm workers. This indicates that non farming livelihood reduces the level expected poverty in rural Nigeria. Observed and expected poverty are highest among household heads whose age ranges between 40-49 years. A predicted/observed poverty ratio of 1.14 for age range 40-49 years, implies that for every 100 household heads within this age group that are poor now, 14 more are expected to be poor in future. The age group between 20-29 years had the lowest observed poverty but the predicted/observed poverty ratio of 0.99. The age groups that is 60 years and above also had predicted/observed poverty ratio of 0.91, this implies that they have high likelihood of exiting poverty in the future.

Table-4. Expected/ observed poverty profile of rural households in Nigeria by demographic/

The group 40-49 and 50-59 year might get into more poverty because it is likely that most of them are not educated and might have large family size to cater for.

The Table depicts a positive correlation between vulnerability and household size. The least vulnerable household size of 1-5 and they are the only group that will have a high probability of exiting poverty in future because the predicted/observed poverty ratio is 0.84. The other groups from 6-10 to above 20 had the number of vulnerable household increasing with increased household size.

The relationship between vulnerability to poverty and the assets which households have is also important from policy perspectives. In general, people who live with household heads with some form of asset are likely to exit poverty in future because they have some form of buffer when confronted with any kind of shock. In this study access to electricity was analysed. Households that have access to electricity from the national grid had an observed poverty of 50.89 percent, expected poverty of 47.86 percent and a predicted/observed poverty ratio of 0.94. Which means that household with electricity have a high probability of exiting poverty in future. Those households that do not have access to electricity had an observed poverty of 54.4 percent with vulnerability index of 57.6 percent.

The unemployment rate in Nigeria is high and it affects poverty and vulnerability to poverty. Table-5 reveals that observed and predicted poverty was 57.5 percent and 51.2 percent when unemployment rate is between 0-10 percent with predicted/observed poverty ratio of 0.89. This group has high probability of exit poverty while the remaining unemployment groups are not likely to exit poverty. The more rainfall in millimetres the lower the observed and expected poverty and household are more likely to exit poverty in future.

Malaria is prevalent in Nigeria and has been said to a source and cause of poverty in Nigeria. Households with malaria groups between 0-3000 and 3001-6000 have a predicted/observed poverty ratio of 0.82 and 0.75, which implies that they are likely to exit poverty in future. This might be because of malaria control measures, such as the roll back malaria effort of the government. The households within the other malaria group have a high probability of not exit poverty. All the cases of river blindness in the pooled data increased poverty and vulnerability to poverty and none of the households having cases river blindness is likely to remain poor in future. This might be because river blindness causes irreversible blindness and the sufferers might not be able to continue with their respective vocation. AIDS is prevalent in the North Central zone. In the pooled data, only the first group of AIDS cases has high probability of exiting poverty. The predicted/observed poverty ratio increased with increase in the number of armed robbery cases. The number of armed robbery cases between 0-50 will probability exit poverty in future with a predicted/observed poverty ratio of 0.96.



socioeconomic characteristics.

Demographic\socioeconomic characteristics	Expected Poverty	Observed poverty	Expected\observed poverty ratio
Geopolitical zone			
South	0.5969	0.5329	1.12
South East	0.3643	0.4198	0.86
South West	0.2886	0.4677	0.61
North East	0.7107	0.7362	0.96
North West	0.6864	0.7095	0.98
North Central	0.6632	0.6953	0.95
Educational level			
No formal education	0.6916	0.6204	1.11
Primary education	0.5537	0.5202	1.06
Secondary education	0.4777	0.4975	0.96
Tertiary education	0.2360	0.3768	0.62
Farming/Non farming			
Farming	0.6909	0.6692	1.08
Non farming	0.3649	0.4092	0.96
Gender			
Male	0.5988	0.5829	1.02
Female	0.4392	0.4385	1.00
Age household head			
10 -19 years	0.5121	0.4543	1.12
20 -29 years	0.4461	0.4478	0.99
30 -39 years	0.5254	0.5357	0.98
40 -49 years	0.6683	0.5813	1.14
50 -59 years	0.6443	0.5729	1.12
60 and above	0.5193	0.5696	0.91
Household size			
1 -5	0.4114	0.4853	0.84
6 -10	0.5587	0.5406	1.03
11 -15	0.6834	0.7141	1.26
16 -20	0.7642	0.7318	1.01
>20	1	0.8536	1.17
Access to electricity			
Yes	0.4786	0.5089	0.94
No	0.5766	0.5448	1.05
Access to drinking water			
Yes	0.4576	0.4818	0.95
No	0.5099	0.4126	1.11
Modern wall			
Yes	0.4047	0.4310	0.94
No	0.5088	0.4765	1.07
Unemployment (%)			
0 -10	0.5125	0.5733	0.89



11 -20	0.6050	0.5842	1.03
21 -30	0.6729	0.6507	1.03
31 -40	0.7482	0.6405	1.16
Rainfall (mm)			
0 -50	0.6224	0.5348	1.16
51 -100	0.4135	0.5280	0.78
101 -150	0.4726	0.5725	0.82
151 -200	0.5362	0.5437	0.98
AIDS cases			
0 -31000	0.3226	0.5981	0.53
31001 -61000	0.4735	0.5042	0.93
61001 -91000	0.6143	0.5921	1.03
91001 -121000	0.6047	0.5425	1.11
121001 -151000	0.7003	0.6538	1.07
Malaria cases			
0 -3000	0.4595	0.5564	0.82
3001 -6000	0.3597	0.4745	0.75
6001 -9000	0.5684	0.5572	1.02
9001 -15000	0.5859	0.5023	1.16
>15000	0.6580	0.6424	1.02
River blindness cases			
0 -2000	0.5423	0.5496	0.98
2001 -4000	0.6135	0.5604	1.09
4001 -6000	0.5725	0.5125	1.11
>6000	0.6734	0.6265	1.07
Temperature			
15 -18	0.5679	0.5419	1.04
19 -21	0.2867	0.5024	0.57
22 -25	0.5900	0.5602	1.05
26 -33	0.3919	0.4534	0.86
Armed robbery cases			
0 -50	0.5783	0.5467	1.05
51 -100	0.5941	0.5605	1.05
101 -150	0.5494	0.5294	1.03
151 -200	0.6286	0.5704	1.10
>200	0.6724	0.5705	1.17

Source: Authors computation

Decomposition of expected poverty by sources

Understanding the source of vulnerability is a prerequisite for formulating a coherent social risk management strategy. The decomposition of the expected poverty was arrived at by comparing the expected poverty of household, with a reference household which is the one with the highest level of expected poverty in the population. The decomposition was done based on the significant variables in the 3FGLS. Selection of variables relating to geographical zonings, educational status,

occupation, gender, age of household head and household size based on its significance. Also selected, are electricity, safe drinking water and use of modern wall. This decomposition was done by estimating the relativity of the expected per capita consumption of a given household to the household with the highest level of expected poverty keeping the variance constant. The difference in the variance of expected consumption was estimated using the relativity of the variance of a given household to the reference household keeping the expected



log of consumption constant. The results of the decomposition are presented in Table-5.

The decomposition by geographical zones shows that the North Central and North East have the least mean consumption and the second least variance. The key mitigating strategy against high level of expected poverty among households in the North Central is raising per capita consumption and stabilizes consumption. Stabilizing consumption can be done by processing and preserving farm product when there is a glut so that there will be enough during the dry season. Income diversification can also be an effective tool in stabilizing consumption. However the source of expected poverty indicates that the variance of consumption explains the predicted poverty more in the South East and South West zones. The appropriate policy for alleviating expected poverty is more of consumption smoothening. The South west zone has the lowest expected poverty and the second highest mean consumption and also one of the lowest consumption variance. Expected poverty is highest in the North East and it is caused by low mean consumption.

The decomposition of expected poverty with respect to educational status of household heads shows that household heads with no formal education have the lowest mean consumption level while those with tertiary education have the highest mean consumption. In general, mean consumption increases with the level of educational status. On the other hand, the consumption variance is highest for households headed by primary school leavers. This is followed by those with no formal education. The consumption variance for secondary education is the least followed by tertiary education. Chaudhuri, Jalan and Suryahadi (2002) determined for Indonesia a negative correlation between schooling and vulnerability. Interestingly, their results also disclose that vulnerability of rural households with no formal schooling stems from low mean of consumption prospects.

Household whose principal occupation is farming have higher mean consumption and higher variability in consumption compared with their non-farming counterparts. Smoothening consumption strategies are necessary to militate against expected poverty among farming households. Male headed households have lower mean consumption and lower consumption variance compared with female-headed households. Christiaensen

and Boisvert's (2000) study in the Northern part of Mali also points to the same direction, in that female-headed households show higher expected average consumption along with a lower variance. Raising per-capita consumption for male-headed households and consumption smoothening strategies for female-headed households are key to militating against expected poverty.

The decomposition of age of household head shows that the age group between 10 and 19 has the highest mean consumption and one of the highest consumption variance. For this group consumption smoothening strategies is needed to guard against expected poverty. The age group 40-49 years and 50-59 years has almost the same expected poverty and the lowest consumption variance and lowest per capita consumption. The expected poverty of household heads that are 60 and above is caused by consumption variance because it has the highest consumption variance

The result of the decomposition of expected poverty with respect to household size shows that mean consumption decreased with increase in household size. Therefore household with 1-5 members had the highest mean consumption and households with more than 20 members had the lowest mean consumption. Households with 16-20 members had the highest consumption variance while 1-5 members had the lowest consumption variance. The key mitigating strategies against high level of predicted poverty among households with more than 20 members are raising per capita consumption and stabilizing consumption.

Households with access to safe drinking water and those without had the same mean consumption but different consumption variance, the consumption variance of households with safe drinking water is lower than their counterpart without access to safe drinking water. Households' heads that have access to electricity have higher mean consumption and higher consumption variance when compared with their counterparts that do not have access to electricity. Those households whose houses are built with modern walls have lower mean consumption and higher consumption variance than those without have modern walls. As the amount of rainfall increase the mean consumption of household's increases and the consumption variance decreases.

**Table-5.** Decomposed different sources of expected poverty among rural households in Nigeria.

Demographic\socioeconomic characteristics	Expected poverty	Mean consumption index	Consumption variance Index
Geopolitical zone			
South	0.6469	0.0518	0.0326
South East	0.3643	0.0732	0.0481
South West	0.2886	0.0576	0.0373
North East	0.6807	0.0195	0.0125
North West	0.6264	0.0028	0.0076
North Central	0.6532	0.0119	0.0246
Educational level			
No formal education	0.6916	0.0237	0.0327
Primary education	0.5537	0.0452	0.0289
Secondary education	0.4777	0.0511	0.0227
Tertiary education	0.2360	0.0830	0.0281
Farming/Non farming			
Farming	0.6909	0.0274	0.0274
Non farming	0.3649	0.0570	0.0301
Gender			
Male	0.5788	0.0340	0.0226
Female	0.4392	0.0653	0.0403
Age household head			
10 -19 years	0.5121	0.0713	0.0293
20 -29 years	0.4461	0.0608	0.0171
30 -39 years	0.5254	0.0426	0.0213
40 -49 years	0.6683	0.0310	0.0277
50 -59 years	0.6443	0.0306	0.0318
60 and above	0.5193	0.0430	0.0367
Household size			
1 -5	0.4114	0.0991	0.0207
6 -10	0.5587	0.0699	0.0296
11 -15	0.6834	0.0548	0.0396
16 -20	0.7642	0.0345	0.0618
>20	1	0.0168	0.0468
Access to electricity			
Yes	0.4786	0.0385	0.0280
No	0.5766	0.0389	0.0285
Unemployment (%)			
0 -10	0.6125	0.0722	0.0242
11 -20	0.6050	0.0609	0.0234



21 -30	0.6729	0.2959	0.0356
31 -40	0.7482	0.0287	0.0587
>40			
Rainfall (mm)			
0 -10	0.6224	0.0415	0.0106
11 -20	0.4135	0.0528	0.0293
21 -20	0.4726	0.2772	0.0431
31 -40	0.5362	0.0382	0.0264
>40			
Malaria cases			
0 -3000	0.4595	0.0366	0.0376
3001 -6000	0.3597	0.0529	0.0319
6001 -9000	0.5684	0.0339	0.0028
9001 -15000	0.5859	0.0520	0.0177
>15000	0.6580	0.0135	0.0151
River blindness cases			
0 -2000	0.5423	0.0367	0.0261
2001 -4000	0.6135	0.0351	0.0232
4001 -6000	0.5725	0.0548	0.0418
>6000	0.6734	0.0541	0.0677
Temperature			
15 -18	0.5679	0.0430	0.0181
19 -21	0.2867	0.0460	0.0523
22 -25	0.5900	0.0315	0.0233
26 -33	0.3919	0.0709	0.0194
Armed robbery cases			
0 -50	0.5941	0.0673	0.0205
51 -100	0.5494	0.0388	0.0328
101 -150	0.6286	0.0328	0.0393
151 -200	0.6724	0.0361	0.0262
>200			

Source: Authors computation

CONCLUSIONS AND RECOMMENDATION

This study established that both idiosyncratic and covariate factors affects consumption and vulnerability to poverty in rural Nigeria. Estimates show that more than half the population in rural Nigeria was vulnerable to poverty during 2004. At the standard vulnerability threshold of 0.5, 62.2% of rural households were vulnerable to poverty. Vulnerability to poverty was higher in northern zones and lower in the southern zones. Male headed households (59.8%) were more vulnerable to poverty than their female counterpart (43.9%). The vulnerability to poverty of farming households was higher

than non-farming households. For every 100 households that were poor, 12 more will be poor in future in south, 11 more in households with heads without formal education, 8 more in farming households and 6 more in male headed households. Consumption variance index was consistently higher among non-farming households (0.0301), female headed households (0.0403) and those with primary education (0.0327). Mean consumption index was lower among farming households (0.0274), male headed households (0.0274), those with no formal education (0.0237) and those with household size greater than 20 (0.0168). Households with 1-5 members had the highest



mean consumption and households with more than 20 members had the lowest mean consumption, while household's with 1-5 members have the highest consumption variance. The age group 40-49 years and 50-59 years have almost the same expected poverty and the lowest consumption variance and lowest per capita consumption.

There is a clear observation in our analysis that the northern part of Nigeria is more vulnerable to poverty than the southern part. Social protection policies should be more concentrated in the north. Formal and informal insurance against adverse occurrence is necessary to reduce poverty. Farming households again are more vulnerable than non-farming households, which indicate the need for more protection of the farming community. Government at all levels should encourage farmers on the need to adopt improved or modern agricultural technology as it will translate to increased output and invariably better income for the households. Consumption smoothening will be an appropriate policy for mitigating against expected poverty among female headed, non-farming households and those with primary education. Mean consumption index was lower among farming households, male headed households, those with no formal education and those with household size greater than 20. These have implication for growth enhancing policies that raise per capita consumption of rural households.

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