



ASSESSMENT OF POVERTY PERSISTENCE AND VULNERABILITY OF RURAL HOUSEHOLDS IN NIGERIA

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ABSTRACT

The study assessed persistence and vulnerability to poverty among rural households in Nigeria. The Nigeria - Living Standards Survey (NLSS) of year 2018 – 2019 dataset was used. Employing 3-stage Feasible Generalized Linear Regression (FGLS) to estimate vulnerability to poverty; the average age of the respondents stood at 48 years with average household size of 6 and dependant of 4 on average. The result further showed that higher proportion of the rural households were vulnerable to poverty. Less than half (44%) of the households were highly vulnerable to poverty and 34.5% were moderately vulnerable to poverty. The expected poverty was higher (71.4%) than the observed poverty (67.1%), indicating that higher poverty is imminent in future. Furthermore, the study shows that the coefficient of primary education ($p = 0.075$), access to credit ($p = 0.000$), electricity ($p = 0.033$), farm asset ($p = 0.000$), and remittance ($p = 0.043$) indicated a negative sign and significantly influence vulnerability to poverty. In conclusion, poverty will persist and increase with rise in age, dependency ratio, covariate and idiosyncratic shocks, lack of formal education, distance to health facility and type of toilet used by the respondents. The study therefore recommends prompt implementation of measures that will reduces shocks specific to regions in the country.

Keywords: Persistence, Vulnerability, Poverty, Rural, Households

INTRODUCTION

Nigeria has higher record of poverty in time over decade now. Since late 1990s, every measure of poverty ranks Nigeria at the bottom list of nations. According to (United Nations Development Programme [UNDP, 2010]), Nigeria has Human Development Index (HDI) of 0.423 which ranks the country 142 out of 169 countries in 2010. Also, the country has an estimated GNI per capita of \$2156, life expectancy at birth of 48.4 years and Multidimensional Poverty Index (MPI) of 0.368. The poverty in Nigeria has kept increasing due to the higher proportion of the populace that is vulnerable to poverty. Despite the first United Nations Millennium Development Goals (MDGs) agreed by world leaders in year 2000, which is the eradication of “extreme” poverty and hunger by the year 2015, poverty still remains a serious problem in sub-Saharan Africa. Most of the development stakeholders are faced with the challenges on how to reduce poverty especially in developing economy such as Nigeria (Olarinde *et al.*, 2020). According to Alayande and Alayande (2004), Nigeria suffers from high levels of poverty in spite of her enormous wealth of human and material resources. In National Bureau of Statistics (NBS, 2012), poverty was reported to have grown to the extent that about 69% of the population which represents 112,519 million Nigerians was poor. Africa Economic Outlook (2012) reported that 63% of Nigeria population spent less than a dollar per day. Kale



(2012) posited that there is tendency of more individual becoming vulnerable in the future if potential impacts of several anti-poverty programs, such as food security intervention program, are not considered. 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.

The degree to which a household is vulnerable to poverty at any given time is determined by how its possibilities for employment and general well-being are expected to change over time. Its ability to moderate consumption in the face of income or other livelihood shocks, as well as its prospects for future income and the degree of income volatility it experiences, all play a role in this. These in turn rely on the intricate and dynamic relationships that exist between the household's operating macroeconomic, institutional, sociopolitical, and physical environments, the resources—human, material, and financial—that it commands, and its behavioral reactions (Chaudhuri 2003). An assessment of vulnerability is, therefore, innately a more difficult task than assessing who is poor and who is not. Poverty is an ex-post measure of a household's well-being (or lack thereof). It reflects a current state of deprivation, of lacking the resources or capabilities to satisfy current needs. Vulnerability, on the other hand, may be broadly construed as an ex-ante measure of well-being, reflecting not so much how well off a household currently is, but what its future prospects are. What distinguishes the two is the presence of risk—the fact that the level of future well-being is uncertain. The uncertainty that households face about the future stems from multiple sources of risk—harvests may fail, food prices may rise, the main income earner of the household may become ill, etc. If such risks were absent (and the future were certain) there would be no distinction between ex-ante (vulnerability) and ex-post (poverty) measures of well-being (Chaudhuri 2003). Conclusions must draw about a household's potential for future consumption in order to determine its susceptibility to poverty. And to achieve that, we want a paradigm that allows us to explicitly consider the cross-sectional and inter-temporal factors of household spending patterns. The impoverished of today could not necessarily be the poor of future in another realm. Currently non-poor households may become impoverished tomorrow after experiencing the shock, as they are highly likely to experience a significant unpleasant shock. Furthermore, some of the households that are currently impoverished may only remain so temporarily, while others may become even poorer in the future. This definition would be used in the research. By definition, vulnerability assessments must have a clear forward-looking perspective. No matter how comprehensive the statistics, household vulnerability is never readily apparent. On the other hand, the majority of assessments of poverty are expressed in terms of time, and with the correct information, it is feasible to notice the household's current state of poverty (Chaudhuri, 2003).

The term "vulnerability" refers to the possibility of events having a detrimental effect on people, homes, businesses, communities, and nations. The incapacity of a home to maintain its quality of living in the face of an unfavorable event is known as household vulnerability (Luigi, 2004). In general, vulnerability is the possibility of suffering negative consequences from an occurrence or modification (Kelly and Adger, 2000). A vulnerability assessment should look at the type of shock, how it enters the home, and the coping strategies that are in place there (Holzmann and Jørgensen 2000; Shaffer, 2001). According to the economics literature, vulnerability is typically understood as the result of a household's reactions to risks in the context of a set of underlying circumstances. Households who have experienced or are projected to experience poverty or destitution due to the cumulative effect of risk and response are considered vulnerable. Policy makers presume that the outcome, or poor status, is an ex post state and should be their main focus. Some economists have begun using measures of

outcome variability (such as income variation) as a result of this thinking, particularly negative shocks) as a gauge of their susceptibility (Alwang *et al.*, 2001).

The methods used in the microeconometric literature to evaluate vulnerability fall into three main groups. Vulnerability is interpreted in the first as expected poverty (VEP). Authors such as Christiansen and Subbarao (2005), Chaudhuri *et al.* (2002), and Pritchett *et al.* (2000) write in similar vein. According to Pritchett *et al.* (2000), being vulnerable to poverty means having lived in poverty for a relevant amount of time (t) during a specific time period $t = -\infty, -2, -1, 0$, or the probability of experiencing poverty in the near future. For Chaudhuri, *et al.*, (2002), vulnerability to poverty is the probability to become or remain poor at time $t + 1$, given certain socio-economic characteristics at time t. The perception of vulnerability to poverty is the absence of households' resilience to shocks that can bring welfare below a threshold deemed acceptable by society. It is true that the last two definitions are more futuristic. In any event, the definition that academics use the most frequently is the likelihood that a person or household will become impoverished. It is arguably desirable that a vulnerability measure provide a complete picture to distinguish between those who are at risk of falling into poverty, those who have the ability to escape poverty, and those whose fundamental circumstances are so weak that they are trapped in poverty, even though knowing the probability of falling into poverty may be preferable to a static assessment of poverty. Formally, one functional form to describe vulnerability is provided by Chaudhuri, *et al.* (2002), where V_{it} is the likelihood of predicted poverty of family i at time t:

$$V_{it} = \int_{\beta_{t+1}} \left(\int^z dF(y_{i,t+1} | X_i, \beta_{t+1}, \alpha_i, \varepsilon_{i,t+1}) \right) dG(\beta_{t+1} | \beta_t) \quad \text{-----}(1)$$

Where $dF(\cdot)$ is the cumulative density of $y_{i,t+1}$ conditional on $(X_i, \beta_{t+1}, \alpha_i, \varepsilon_{i,t+1})$ and $dG(\cdot)$ is the cumulative density of β_{t+1} conditional on β_t . equation (1) can be written in a much more empirically implementable fashion as in (2)

$$V_{it} = \Pr(y_{i,t+1} = y(X_i, \beta_{t+1}, \alpha_i, \varepsilon_{i,t+1}) \leq z | X_i, \beta_t, \alpha_i, \varepsilon_{it}) \quad \text{-----}(2)$$

where y is a welfare measure (either consumption or income), and z is the societal benchmark (the poverty line). X_i contains vectors of household characteristics; β_t is a vector of parameters, α_i and a temporal unobservable household effect, and ε_i the error term. Therefore, Equation [2] is the probability that a household will be poor in period $t + 1$ given her fundamental circumstances in period t. An extension of to account for more than one period had been proposed by Pritchett, *et al.* (2000).

METHODOLOGY

The study was carried out Federal Republic of Nigeria. The country, which is located between 3^0 and 14^0 East Longitude and 4^0 and 14^0 North Latitude, has 140,431,790 people living there as of the 2006 population census. Its area is 923,769 square kilometers, consisting of 909,890 square kilometers of land and 13,879 square kilometers of water. The greatest distances are 1,605 kilometers from north to south and roughly 767 kilometers from east to west. The study tends to use the post-harvest and post planting cross section data from the Nigeria - Living Standards Survey (NLSS) of year 2018 - 2019. Three step generalized least square (FGLS) estimation procedure was used to analyze the vulnerability to poverty and to model the effect of household socio-economic status on expected future consumption and variation in future consumption.

Vulnerability as Expected Poverty

Taking into account the dynamic dimensions of poverty, the measure of ‘Vulnerability as Expected Poverty’ (VEP), an ex-ante measure proposed by Chaudhuri *et al.* (2002) was adopted because of the advantage of the VEP approach especially in terms of its ability to identify households that are exposed to risks but who are not poor. In this approach vulnerability is defined as the probability of being poor in the future and basically can take on two forms. It is either the ex-ante risk that a household that is currently not poor will fall below the poverty line or the risk that a household that is currently poor remain poor. This can be formally expressed as:

$$V_t = \text{Prob} (C_{(t+1)} < Z)$$

Where the vulnerability of a household during the current period V_t is dependent on the probability that future household consumption $C_{(t+1)}$ was less than poverty line (Z). Empirically, building upon the works of Chaudhuri *et al.* (2002), VEP was obtained by the following procedure: First, the FGT measure of headcount poverty (Foster, *et al.*, 1984) was estimated from household data. Second, household’s expected consumption and its variance of the error term was estimated using the 3 stage Feasible Generalized Least Square (FGLS) estimation procedure. Household’s vulnerability to poverty was then derived as the conditional probability of the household falling into poverty in the next period or the probability that a household’s consumption lies below the predetermined poverty line in the near future

$$\hat{VEP}_i \equiv \hat{v}_i = \hat{Pr}(\ln c_i < \ln z | X_i) = \Phi \left(\frac{\ln z - X_i \hat{\beta}}{\sqrt{X_i \hat{\theta}}} \right)$$

The standard vulnerability threshold of 0.5 was adopted following (Gaiha *et al.*, 2007; Imai *et al.*, 2009; Oni and Yusuf, 2006) where households were classified into their vulnerability status. Hence, those with a 50 per cent or more chance of falling into poverty in the future were identified as vulnerable.

Thus, the explanatory variables that were used in the regression analysis are and measured as; X_1 = Age of household head (years); X_2 = Gender (1=male, 0=female); X_3 = Household size (Number); X_4 = Dependency ratio (Number); X_5 = No formal Education (Yes =1, Otherwise = 0); X_6 = Primary Education (Yes =1, Otherwise = 0); X_7 = Secondary Education (Yes =1, Otherwise = 0); X_8 = Access to credit (Yes =1, Otherwise = 0); X_9 = Covariate shocks (Yes =1, Otherwise = 0); X_{10} = Idiosyncratic shocks (Yes =1, Otherwise = 0); X_{11} = Distance to health (kilometers); X_{12} = Electricity (Yes =1, Otherwise = 0); X_{13} = Type of toilet (Yes =1, Otherwise = 0); X_{14} = Farm Asset (Yes =1, Otherwise = 0); X_{15} = Access to remittances (Yes =1, Otherwise = 0); X_{16} = Farming (Yes =1, Otherwise = 0); X_{17} = Non-farm (Yes =1, Otherwise = 0).

RESULTS AND DISCUSSION

The description and summary statistics of some of the variables used in this study were presented on Table 1 below. The table revealed the variables, their descriptions, the mean values and the standard deviation. From the table, the result showed that the average age of the household head was about 48 years; this implied that most of the household heads considered in this study were still active and productive when compare to the productive age of labour. The household size was about 6 persons on the average, this still presents a fair household size as it still not too large. The dependency ratio which was measure as the total number of children and adult who depend on the households’ head were averaged as 4 members. The table equally showed other variables measure as binary or categorically. These variables include: gender, no



education, primary, and secondary education, covariate and idiosyncratic shocks, access to health facility, farm assets, types of toilet, access to credit, farming and non-farm occupation and remittance.

Table 1: Description and Summary Statistics of the variables

Variables	Description	Mean	Std. Dev
Age	Age of the household head	48.33	0.986234
Gender	Sex of the household head	0.683	0.056259
Household size	Number of persons living within household with common purse	6.337	0.832077
Dependency ratio	Number of children and adult dependants on the household head	4.254	0.367272
No Education	If the household head doesn't attend formal school	0.643	0.2944325
Primary Education	If the household head attend primary school	0.935	0.432447
Secondary Education	If the household head attend secondary school	0.861	0.500445
Access to Credit	If the respondents have access to formal credit	0.359	0.332971
Covariate shocks		0.247	0.468227
Idiosyncratic shocks		0.599	0.221669
Access to Health facility	Respondents have access to health facilities e.g hospital, maternity and so on	0.618	0.359926
Electricity	Respondents have access to electricity	0.792	0.354854
Types of toilet	Household have access and the use of toilet	0.336	0.231858
Farm assets	Agricultural infrastructure e.g. land, buildings, farm equipment and so on	0.379	0.259404
Access to remittances	If the respondents have access to remittance	0.422	0.497203
Farming	Farming as major occupation	0.668	0.516443
Non-Farming	Non-farming as major occupation	0.573	0.404311

Source: Author's computation, 2022

Poverty and Vulnerability Status:

Vulnerability to poverty status of the rural households in Nigeria was presented on Table 2. The result showed that about 43.8% of the respondents were highly vulnerable; having vulnerability index that is greater than 0.5. The results also revealed that 35% were moderately vulnerable while 21.7% of the respondents were categorized to experience low vulnerability. In Agbaje *et al.* (2013), more than 62% of the rural households were reported to be vulnerable to poverty, while Sanusi and Fanifosi (2019) revealed that more than 46% were poor and vulnerable to expected poverty in Nigeria.



Table 2: Vulnerability to poverty Status of the respondents

Vulnerability status	Frequency	Percentage
Low vulnerable $VI \leq 0.1$	620	21.7
Moderately vulnerable $0.1 < VI \leq 0.5$	988	34.5
Highly vulnerable $VI > 0.5$	1255	43.8
Total	2,863	100.0

Source: Author's computation, 2022

Table 3 showed both the observed and the expected poverty of the respondents. The result indicated that the observed poverty in rural Nigeria stood at about 67% while the expected poverty was estimated to be about 71%. The result indicated that there exists higher poverty level in rural Nigeria and if adequate measures are not in place, the expected poverty will be higher which means that more household will be vulnerable to poverty.

Table 3: Expected and Observed Poverty

Poverty	Estimate	Percentage
Observed	0.671	67.1
Expected	0.714	71.4
Expected/Observed Poverty ratio	1.064	

Source: Author's computation, 2022

Determinants of vulnerability to poverty in rural Nigeria

The last stage result of the 3- stage Feasible Generalized Least Square (3FGLS) was presented on Table 4; the table revealed that the coefficient of primary education ($p = 0.075$), access to credit ($p = 0.000$), electricity ($p = 0.033$), farm asset ($p = 0.000$), and remittance ($p = 0.043$) indicated a negative sign and significantly influence vulnerability to poverty. The result revealed that increase household size will increase vulnerability to poverty. Per capita consumption tends to be low with increase in household size (Odusina *et al.*, 2014) especially for the low income earners and this might plunge the members deeper into poverty. Likewise, the number of dependant within household has a serious implication on vulnerability to poverty. As we have it in this study, it is evidence that increasing dependent ratio will cause more households to be vulnerable to poverty; owing to the fact that more people depends on the little available resources.

The coefficient of no formal education was also positive and statistically influences vulnerability to poverty. The importance of education cannot be overlooked when considering vulnerability to poverty. Household with little or no formal education tends to be vulnerable that those that have higher education. With education, there might be opportunities that could be tapped into and fetch one more income. Hence, this will improve the wellbeing of the household members. From the result presented here, we found that both primary and secondary education tends to reduce vulnerability to poverty; indicating that education increases the chance to decline vulnerability to poverty.

Furthermore, finance is vital to the concept of poverty reduction. The result shown on the Table revealed that household reduces the chance of becoming vulnerable to poverty when there is access to credit facilities. Access of credit was found to reduce vulnerability to poverty;



this result implied more access to credit facilities will reduce vulnerability to poverty. Both covariate and idiosyncratic shocks increases the likelihood of becoming vulnerable to poverty. These shocks lead to loss of properties and income. Therefore, household with higher shocks tend to be more prone to poverty.

In the same vein, deprivation in social, economic and agricultural infrastructure increases the likelihood of becoming vulnerable to poverty. It is evident from the result presented that electricity and farm asset ownership reduces the probability of becoming vulnerable to poverty. Energy is vital in production of goods and service. Therefore, individual needs electricity in production of goods and services. This will enable households to have more income which might invariably exit people from poverty. Farming as occupation of most of the rural dwellers was found to increase vulnerability to poverty. The subsistence nature of farming in the rural area might be responsive for the result. Most of the rural farmers were landless, and cultivate less than 5 acres of land. Most of their production is meant to feed themselves and their immediate families.

Table 4: Determinants of vulnerability to Poverty – Last stage of 3FGLS

Variables	Coefficient	Std.Err	t	P>(t)
Age	3.6148	1.9422	1.86	0.063*
Gender	0.0013	0.0583	0.02	0.983
Household size	0.5018	0.0662	7.58	0.000***
Dependency ratio	1.0457	0.5837	1.79	0.073*
No formal Education	0.6821	0.4048	1.68	0.092*
Primary Education	-2.0058	1.1281	-1.78	0.075*
Secondary Education	-0.9946	0.0208	-0.26	0.797
Access to Credit	-0.1447	0.0461	-3.14	0.000***
Covariate shocks	0.3277	0.0619	5.29	0.000***
Idiosyncratic shocks	0.0805	0.0202	4.00	0.000***
Distance to Health facility	0.8801	0.2673	0.42	0.674
Electricity	-4.0634	1.8717	-2.17	0.033**
Types of toilet	3.0279	1.5704	1.93	0.055*
Farm assets	-0.0092	0.008	-5.39	0.000***
Access to remittances	-1.0070	0.4880	-2.06	0.043*
Farming	2.0344	0.6034	3.37	0.000***
Non-Farm occupation	-0.0459	0.0626	-0.73	0.465
Constant	2.1863	0.1469	11.64	0.000***
Diagnostics:				
Number of obs	= 3690			
Prob > F	= 0.0000			
R²	= 0.6347			
Adjusted R²	= 0.6184			

Source: Author's computation, 2022

CONCLUSION AND RECOMMENDATION

The study concluded that higher proportion of the rural households were vulnerable to poverty. The expected poverty was higher than the observed poverty, indicating that higher poverty is imminent in future. In addition, age, household size, dependency ratio, no formal education, primary education, secondary education, credit access, covariate shocks, idiosyncratic shocks, electricity, types of toilet, farm asset, remittance and farming influences



consumption expenditure in the study area. The study recommends the following: (a) prompt implementation of measures that will reduce shocks specific to regions in the country, (b) Controlling the major outflow of funds will mitigate flood especially in North Central state, (c) there should be proper awareness for birth control, as higher households size will further increase poverty.

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