Assessment of Multidimensional Poverty: A case of North Eastern and South Western States of Nigeria.

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ABSTRACT

The study investigates the multidimensional poverty of rural households in North Eastern and South Western state of Nigeria. Two stage sampling techniques were used to sample the respondents from the general household survey (GHS) wave 2 and a total sample of one thousand four hundred and sixty (1460) households were selected. The study adopted Alkire-Foster MPI approach to estimate the multidimensional poverty in the study area. From the result, more than 74% of the households in the study area were multidimensional poor with the adjusted headcount ratio of 37.5% which indicated multidimensional poor households when the cutoff (k) was 0.3. The result also shows that more than 90% of the households in the north eastern part of the country were multidimensional poor while south west accounted for about 56%. The overall headcount poverty shows an increasing trend as the cutoff increases; the result indicated high level of multidimensional poor households in the zones. Living condition contribution to MPI increases with rise in the cutoff (k); this indicated deprivation of infrastructures in terms of basic amenities that the households could have enjoyed. Therefore, the study recommends improvement in provision of basic amenities for the benefit of the people.

Keywords: Asset, Deprivation, Household, Cutoff, multidimensional poverty (MPI)

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INTRODUCTION

Poverty levels of most developing countries in the world and particularly in sub-Sahara Africa poses serious threat to the overall development of the continent (Omideyi, 2007). It constitutes the major challenges for the development stakeholders in the developing economy. In the year 2000, the world leaders agreed on eradication of extreme poverty and hunger by 2015, under the auspices of the first UN Millennium Development Goal (MDG). Quantitatively, the development targeted at halving the proportion of those that lived on income less than a $1-a-day over the period 1990-2015. Poverty has been a serious issue of various successive governments in Nigeria, not only in itself but also as a challenge for poverty reduction mandate throughout the African continent. In spite of the abundant natural endowment, and human resources potentials, the socio – economic and political situations of the country have been unpredictable for more than two decades with unsympathetic cost for the welfare of its population. A description by the United Nations (UN, 2006), on poverty assessment explain that more than 70% of the poor Nigerian populace are living on less than a dollar per day, that is less than N150 per day (an exchange rate as at that time). The assessment equally showed that poverty is mainly higher in rural areas; this is where most of the people are resident and lived on agriculture as sources of livelihood (NBS, 2006).

Different people viewed as incapability of a person to perform requisite functions to the household basic needs especially feeding, housing, education, and clothing and so on". According to the World Bank Participatory Poverty Report (1999), poverty is termed failure of certain persons to make a minimum standard of living". Decluwe, *et al.,* (1999) in his view defined it as "deficiency in acquiring basic consumption needs such as food, clothing and or shelter". This lack of resources constitutes the major failure for individual in protecting himself against social, economic and political deprivations. Poverty is not simply a lack of adequate income. It is a multidimensional trend that extends ahead of the economic ground to include factors such as the failure to partake in social and political life (Sen, 1979; 1985; 1987). In short, poverty is the deprivation of one's ability to live as a free and regal human being with the full prospective to achieve one's most

wanted goals in life.

Poverty is evident in form of insufficient income and productive resources that will ensure sustainable livelihoods; hunger and malnutrition; ill health; inadequate or total deprivation of access to quality education and other indispensable services; increased morbidity and transience from illness; homelessness and insufficient housing; hazardous environments; and social favoritism and segregation. It is also portrayed by a lack of partaking in decision making and in civil, social and cultural life (UN, 2010). Nguyen (2004) gave a brief concept of poverty. He refers poverty as a state involving those severe deprivation and difficult incidence that are connected with insufficient economic possessions. The economic assets was established to an encompassing rights to own property, ease accessibility to productive employment and other factors of production such as land, labour, capital and infrastructural facilities.

According to Abdulai, and CroleRees (2001), poverty is characterized to be absolute poverty, relative poverty and material poverty. Absolute poverty is the inability to provide for physical subsistence to the extent of being incapable of protecting human dignity. It implies inadequate access to food, clothing and shelter, portable water health services, basic education, public transportation and employment. People in absolute poverty earn little incomes which will not enhance savings that is it will lead to zero marginal propensity to save and a short life span. Relative poverty is defined with respect to living standards that prevail in a particular society and this changes overtime. Material poverty depicts lack of ownership of physical assets such as land and animal.

In Nigeria, the number of the rural poor declined from 26.4million in 1985 to 22.8million in 1992 (World Bank, 1996). Also, between 1985 and 1992, total extreme poverty increased from 10.1million people to 13.9million with a near three-fold increase in the urban extreme poor from 1.5million to 4.3million people. Rural households are the most affected; the rural dwellers are primarily subsistence farmers (IFAD 2012). Efforts by past government to rapidly develop the rural area in the country are not yielding positive result (Oyeranti and Olayiwola 2005) and the situation is getting worse day-in-day-out. The state of public infrastructure is becoming moribund; road

access, health facility, electricity and education centres increasingly become difficult for common people to access in spite of the natural endowment of the country in terms of mineral resources and human capital (Adeoti 2014). In lieu of the above argument, this study estimated the multidimensional poverty of the people in the North Eastern and South Western States of Nigeria.

METHODOLOGY

The study was carried out in Nigeria. Wave 2 of the Nigeria General Household Survey (GHS) – Panel 2012/13 conducted by National Bureau of Statistics (NBS) was used to obtain the needed data for the study. This data contains rich demographic information and relevant socioeconomic data on households, food and non food expenditures and household assets. This study adopted a two stage stratified sampling techniques to sampled the respondents used for the study. The first stage involves clusters of housing units called Enumeration Area (EA), and the second stage involves the proportionate selection of the housing units. A total of 1,460 housing unit data were found useful for the study in the two zones. Information on child school enrolment, child mortality, nutrition, house ownership, electronic gadgets, lighting fuel, cooking fuel, drinking water source, floor materials, refuse disposal, and toilet type was explored. Decision was then taken based on the deprivation cutoff assigned whether a household is deprived or not.

Alkire and Foster method of constructing poverty measures: The headcount ratio (H) is the most common method adopted to know the total percentage of the poor population. The Alkire and Foster method of measuring poverty only generate a unique class of poverty measure (M_α) which is better than the simple headcount ratio (H). The three measures of the Akire and Foster in this class are of high importance, they include; the adjusted headcount ratio (M_0), adjusted poverty gap (M_1) and adjusted squared poverty gap (M_2).

Adjusted headcount ratio (M_0) takes into account both the poverty incidence and intensity. Poverty incidence is the percentage of the population who are poor while poverty incidence is the percentage of the

deprivations which individual, or households on average. M_0 is calculated by multiplying the incidence (H) by the intensity (A). $M_0 = H \times A$.

Adjusted Poverty Gap (M_1) measures the incidence, intensity and depth of poverty together. The depth of poverty is the average 'gap' (G) between the level of deprivation poor people experience and the poverty cut-off line. $M_1 = H \times A \times G$.

Adjusted Squared Poverty Gap (M_2) measures the incidence, intensity, and depth of poverty, as well as inequality among the poor (captured by the squared gap, S). $M_2 = H \times A \times S$ (Alkire and Foster, 2008).

Multidimensional poverty measure: In measuring the multidimensional poverty, the headcount ratio is firstly considered. It could also be referred to as the percentage of poor households. This is given as;

$$H=\frac{q}{n} \quad \text{..... (1)}$$

Where q= q(y;z) is the number of households in the set zh, as identified using **ρ**h the dual cutoff method. Alkire and Foster (2008) proposed a headcount measure that is adjusted by the average number of deprivations experienced by the poor. To this end, a censored vector of deprivation counts kh and this is defined so that if $k_i \geq h$, then $k_i(h) = k_i$; and if $k_i < h$, then $k_i(h) = 0$.

This indicate that the count of deprivations in k(h) is always zero for the non-poor households according to the **ρ**h dual cutoff method, while the identified poor households keep the original vector of deprivation counts k_i. Then, $\frac{ki(h)}{d}$ represents the shared possible deprivations experienced by a poor across the poor. This is given by;

A = |k(h`qd)

By focusing on the poor the Alkire – Foster approach allows computing a final adjusted headcount ratio that satisfies the properties of decomposability and poverty focus. The (dimension) adjusted headcount ratio M_0 (y;z) is given by: $M_0 = HA$ or simply the product of the headcount ratio H and the average deprivation shared across the poor A. The (dimension) adjusted headcount ratio clearly satisfies dimensional monotonicity, since A rises when a poor households becomes deprived in an additional dimension.

In addition, similar to the headcount ratio H, M_0 satisfies decomposability, replication in variance, symmetry, poverty and deprivation focus, weak monotonicity, non-triviality, normalization and weak rearrangement (Alkire and Foster 2008). An attractive property of M_0 is that it can be decomposed by population decomposition is obtained by:

$M_0 (x,y;z) = n(x) M_0 (x;z) + n(y) M_0 (y;z) n(x , y) n(x,y)$

Where x and y are the distribution of two subgroups (x,y), the distribution obtained by merging the two; (n(x) the number of households in x,n(y) the number of households in y , and n(x,y) the number of households in n(x,y) . In other words, the overall poverty is the weighted average of subgroup poverty levels, where weights are subgroup population shares. This decomposition can be extended to any number of subgroups. In addition, it is also possible to break down overall multidimensional poverty measure to reveal the contribution of each dimension j to it. Once the identification step has been completed a censored matrix of deprivations g_0 (k) is defined whose typical entry is given by $g_{0ij}(h) = g_{ij0}$ for every i satisfying $k_i \geq h$, while g_{0ij} (h) for i with $k_i < h$. Then, M_0 (y;z) can be breakdown into dimensional groups as:

$$M_0(x,z) = \frac{\Sigma j \psi(gij0(h))}{d} \ldots\ldots$$

$$\text{Consequently, } \frac{1}{d}\psi\frac{(gij0(h))}{M0(y;z)}$$

can be interpreted as the post-identification contribution of dimension j to overall multidimensional poverty.

Analytical techniques: The study employed Alkire and Foster methodology

as explained above to analyse multidimensional poverty. Table 1 reveals the dimension, indicators and deprivation cut-offs used for the study.

Dimension	Indicators	Deprivation cut-off
Education	Child school attendance	a household deprived, if *any* school aged-child is not currently attending school.
	School	Number of households' member that has not completed five years in school.
Health	Child mortality	a household deprived, if any child is dead due to illness
	Nutrition	a household deprived, if any household member is malnourished
Living condition	Electric gadgets	The household is deprived in this indicator if they do not own more than one of a group of small assets (radio, TV, telephone, bike, motorbike, or refrigerator) and do not own a car or truck.
	Lighting fuel	The household is deprived if they do not have access to electricity.
	Cooking fuel	The household is deprived if they cook with wood, coal, straw or dung.
	Drinking water	The household is deprived if it has no safe drinking water or they require more than 30 minutes walk to fetch water.
	Floor materials	The household is deprived if it has a dirt floor (earth, sand, or dung).
	Type of toilet	The household is deprived if it does not have improved sanitation or is shared with another household

Source: Alkire and Foster 2007

RESULTS

Household MPI estimates: Three dimensions were chosen; Education, Health and Living condition for MPI estimation. The result presented on Table 2 showed the headcount ratio H of 74.3% when k=1, 37.7% when k=2 and 15.6% when k=3. This indicated that about 74.3% of the household surveyed were multidimensional poor when k=1, 37.7% when k=2 and 15.6% when k=3. The result also revealed that poverty measure decline with k. This agrees with the findings of Adetola and Olufemi (2012). The adjusted headcount ratio also suggests that 37.5% of the respondents were multidimensional poor when k=1, 22.9% when k=2 and about 11% when k=3. The intensity of poverty shows the share of dimensions in which the poor are deprived; the table shows 50.5% when k=1, 60.7% at k=2 and 68.1 at k=3. The result shows an increase value as k increases. The average deprivation among the poor who experience at least a dimension (k=1) is 1.68, and among respondents who experience at least 2 dimensions (k=2) is 1.21, while 1.14 were affected with at least 3 dimensions (k=3).

Table 2: Multidimensional Poverty indices

K(%)	Adjusted Headcount (Mo =HA)	Headcount (H)	Poverty gap (A)	Average deprivation (A/K)
0.3	0.375	0.743	0.505	1.68
0.5	0.229	0.377	0.607	1.21
0.6	0.106	0.156	0.681	1.14

Source: Author's computation, 2016

Relative contribution of the dimension to MPI: Table 3 shows the relative contribution of the dimension to MPI. Education contributed 4.5% to MPI when k=1, health contributed about 30% and assets contributed more than 65% to MPI when k=1. The relative contribution of education when k=2 was about 4%, and 4.6% when k=3. Also, health dimension of the MPI was found to have contributed 28.4% when k=2 and 25.6% when k=3. Living condition contributed the largely to MPI, 67.7% when k=2 and 69.8% when k=3.

Table 3: Relative contribution of Dimensions to MPI

K(%)	Education	Health	Living condition
0.30	0.045	0.303	0.652
0.50	0.040	0.284	0.677
0.60	0.046	0.256	0.698

Source: Author's computation, 2016

Decomposition of MPI by geopolitical zones: The decomposition of MPI by geopolitical zones was presented in Table 4. When k=1, the result shows headcount poverty in North east of the country with 90.65% and about 57% in South west. The adjusted headcount ratio was 46.64% in the North east and 27.6% in South west, while the poverty intensity in the north east stood at a record of 51.45% and 48.73% in south west. The poverty headcount reduces as low as 47.04% when k = 2 in North east and 27.53% in South west. Also, when k=3, the poverty headcount stood at 68.18% in north east while the south west poverty headcount stood at 67.77%.

Table 4: Decomposed Multidimensional Poverty indices by geopolitical zones in Nigeria.

Poverty cutoff	K(%) = 0.3				K(%) = 0.5				K(%) = 0.6			
Zones	M_0	H	A	AD	M_0	H	A	AD	M_0	H	A	AD
North east	0.4664	0.9065	0.5145	1.72	0.2887	0.4704	0.6139	1.23	0.1428	0.2095	0.6818	1.13
South west	0.276	0.5663	0.4873	1.62	0.1634	0.2753	0.5934	1.19	0.0669	0.0984	0.6799	1.14

Source: Author's computation, 2016

Decomposition of relative contribution of dimensions to MPI by geopolitical zones: The decomposed relative contribution of the three dimensions to MPI was presented on Table 5. The result on the table shows that living condition contributed the highest to MPI in both zones, more than 83% of the MPI emanate from asset deprivation in the north east with only 45.33% in the south west. Deprivation in health is found to contribute about 36% to MPI in north east and 24.56% in south west.

Table 5: Decomposed Relative contribution of Dimensions to MPI by geopolitical zones

Poverty	K = 30%			K = 50%			K = 60%		
cutoff/Zones	Education	Health	Living condition	Education	Health	Living condition	Education	Health	Living condition
North east	0.05272	0.3562	0.8349	0.0507	0.3519	0.8608	0.063	0.3405	0.9391
South west	0.03707	0.2456	0.4533	0.0282	0.2097	0.4769	0.0278	0.1635	0.4377

Source: Author's computation, 2016

Table 6 shows contribution of each indicator to MPI. From the table, when k=1, cooking fuel contributed about 29.25% to MPI followed by child mortality which also contributed 28.42% to MPI, sanitation (12.8%), electricity (7.89%), floor materials (6.6%), source of water (5.1%), years of education (3.6%), electronic assets (3.4%), nutrition (1.9%) and child attendance (0.8%). Also when k=2, the contribution of child mortality (26.65%), cooking materials (26.02%) and sanitation (14.11%) remain high. The result followed the same trend when k=3, the mostly contributed indicator remain child mortality (23.39%), cooking materials (23.34%) and sanitation (13.85%).

Indicators	K = 1	K=2	K=3
Year of schooling	0.03677	0.03144	0.03574
Child attendance	0.008438	0.008454	0.01038
Child mortality	0.2841	0.2665	0.2339
Nutrition	0.01901	0.01714	0.02159
Floor materials	0.06624	0.08227	0.08861
Cooking fuel	0.2925	0.2602	0.2334
Source of water	0.05172	0.0627	0.07224
Sanitation	0.128	0.1411	0.1385
Electricity	0.07894	0.08502	0.09344
Electronic assets	0.03428	0.04524	0.07224

Source: Author's computation, 2016

DISCUSSION

The result revealed a high level of Multi-dimensional Poverty Index (MPI), the overall headcount poverty shows an increasing trend as the cutoff increases; the result indicated high level of multidimensional poor households in the two zones. This corroborated the findings of Adetola and Olufemi (2012). The MPI was further decomposed and the result equally confirmed that MPI is high in both geopolitical zone of the country, although MPI was higher in the North eastern state than the South western counterpart. The might be as a result of insurgency in the area which is threatening the food security of the people in the area and pose a serious threat to the development of infrastructure and maintenance of the existing ones in the area. Living condition is the most contributing dimension to MPI followed by health and education. The result indicated deprivation of infrastructures in terms of basic amenities that the households could have enjoyed. This suggests that effort should be made to make formidable plan and implementation of program that could fast grow infrastructure in the zones by the stakeholders. The result agreed with the work of Amao *et al.*, (2017) where more than living condition is the major factor contributing to MPI. Although, education contributed the least in the entire three cutoffs which could be as a result of different programmes initiated to combat illiteracy in the country through the governmental and non-governmental agencies both local and from the international community. There is still need to increase the human capital by given a quality education to the people at affordable cost. The result indicated that improvement in reduction of infants and little children mortality need urgent action, and also provision of basic amenities for rural communities in the country.

CONCLUSION

The study analyse multidimensional poverty in both north eastern and south western zones of the country and south west zone. The MPI was estimated using Alkire and Foster (2008) methodology. Household data of Nigeria bureau of statistics wave 2 was used and two stage sampling method was adopted to select households for the analysis. Three dimension and ten indicators were considered for the analysis, the MPI was decomposed to estimate the MPI in the zones. From the result, more than 74% of the households in the study area were multidimensional poor with the adjusted headcount ratio of 37.5% which indicated multidimensional poor households when the cutoff (k) was 0.3. The result also shows that more than 90% of the households in the north eastern part of the country were multidimensional poor while south west accounted for about 56%. The overall headcount poverty shows an increasing trend as the cutoff increases; the result indicated high level of multidimensional poor households in the zones. Living condition contribution to MPI increases with rise in the cutoff (k); this indicated deprivation of infrastructures. However, the study concludes that more than half of the households in the two region are multidimensionally poor, and the north eastern part of the country are the most affected and vulnerable. Therefore policy targeted at improving the living standard of the households, through provision of basic social amenities in the regions should receive quick attention.

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