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Assessment of Multidimensional Poverty in Rural and Urban Nigeria: Evidence from Demographic and Health Survey (DHS)

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ABSTRACT Poverty reduction is a major economic development indicator with international acceptability. This paper analyzed the spatial distribution of multidimensional poverty in Nigeria. The study made use of survey-based secondary data of the Demographic and Health Survey (DHS) for 1999, 2003 and 2008. Fuzzy set was used to construct composite welfare indices (CWI) which were subjected to descriptive analyses. The results show that access to safe drinking water sources declined between 1999 and 2008 across the different wealth quartiles and poor households had suffered more severely. National access to electricity increased from 45.82 percent in 1999 to 51.41 percent in 2003, and declined to 45.58 percent in 2008. The poorest (first) quartile was also most deprived. Access to telephone in both urban and rural sectors increased across the years. However, poorest quartiles (first and second) in urban and rural sectors had very low access to telephone. The urban sector's CWI of 0.321, 0.438 and 0.466 in 1999, 2003 and 2008, respectively were higher than those for rural area. Southern geopolitical zones had higher average CWI than their counterparts from the north. Among the state, Lagos records the highest average CWI of 0.059 for the poorest quartile. It was recommended that policy makers should give more priority to provision of basic social services and ensure adequate and proper maintenance especially in the rural areas.

INTRODUCTION

One of the main universally acceptable indicators of underdevelopment is perhaps the extent of welfare deprivation within a country. In this context, development economists are interested in determining the extent of equity in wealth distribution, and what characterizes the deeply deprived. No doubt, the universality of the goal of ensuring poverty reduction as a fundamental parameter for gauging policy and governance impact resulted in very wide accents received by the Millennium Development Goals (MDGs). These presuppose that globally there are great commitments to channel the benefits of economic development among the marginalized poverty- stricken segments of the population.

Although early conceptual formulations about poverty largely treated the poor as those that are lacking basic incomes required for commanding enough expenditure to meet their basic needs of food, education, health and other social services, among others, recent poverty analyses have focused on its multidimensional nature. Therefore, it had been emphasized that the poor not only lack income to command enough commodity bundles, asset deprivations, psychological disturbances, shame, lack of self esteem and many other forms of moral deprivations are important form of poverty (Ogwumike 2002). Therefore, development economists have come to a consensus that poverty is multidimensional in nature, which had also been analyzed from inability to meet basic nutritional needs (Dreze 1990), levels of consumption and expenditures and a function of education, health, life expectancy and child mortality. Multidimensional view of poverty places significant emphasis on every element that forms the basic yardstick for assessing human satisfaction and fulfillment. Although being deprived in multidimensional welfare attributes could presuppose that the household lacks sufficient income, the relevance of economic and social fulfillments in adjudging welfare deprivation had been recently emphasized.

As Africa's most populous country, poverty situation in Nigeria is paradoxically disturbing given the country's natural resource diversity and human capital endowments. In more than five decades after national independence, the country's development profile is still below expectation, with serious nostalgia for the functioning social services of the 1970's. The hallmark of Nigeria's economic retrogression is widespread corruption, which had elevated selfish motives and agendas above any development goals. The Nigerian poor in many instances are

not only unable to afford sufficient income to meet daily food and other needs, they sometimes lack access to water, whether clean or dirty, are unable to afford a mat and lack adequate shelter from adverse weather conditions.

Canagarajah et al. (1997) reported that between 1980s and 1990s, poverty levels and inequality in Nigeria increased. In 2004, National Bureau of Statistics (2005) reported a decline in poverty incidence to 54.4 percent, though it had risen to 69 percent in 2010. The growth in poverty incidence raises a lot of questions in a country where natural resources are abundant. Furthermore, widening poverty gap in Nigeria confirms serious disparities in distribution of wealth (Ali-Akpajiak and Pyke 2003). Such inequality marginalizes the poor and puts the country at the risk of witnessing more crimes, civil unrests, and persistent rebellion against constituted authorities. Resurgences of recent religious crises that had resulted in huge human and financial resource losses in many northern Nigeria could have resulted from widening poverty dimension. This presupposes that in many instances, implementation of policy reforms and programmes to reduce poverty justifies the means.

Some previous studies have analyzed the determinants of poverty in Nigeria judging from the expenditure (unidimensional) and access to basic social services (multidimensional points of view). Onibokun and Kumuyi (1996) in their study on urban poverty argued that poverty is linked to a shortage of vital resources and the endurance of harsh and inhospitable environment, including the breakdown of economics, demographic, ecological, cultural and social systems. However, their study recognized poverty as a way of life characterized by low calorie intake, inaccessibility to adequate health facilities, low quality education system, low income, unemployment/under employment and lack of access to various housing and social services.

Gass and Adetunmbi (2000) asserted that poverty denies its victims the most basic needs for survival, such as food, water, clothing and shelter. Poverty manifests itself not only in economic deprivation but also in terms of individual's inability to access basic social amenities. Akerele and Adewuyi (2010) employed multiple regression analysis to analyze the determinants of multidimensional poverty in Ekiti State. The significant variables were educational status of household heads and household sizes. Oyekale and Okunmadewa (2008) employed Tobit regression analysis to determine the influence of socioeconomic characteristics on poverty in Abia State. The significant variables were male headship, literacy and urbanization.

This study seeks to add to literature on multidimensional poverty in Nigeria and contribute to vital policy debates on the way forward for reducing poverty. The objective is to compute multidimensional poverty using composite asset indices and to provide a spatial description of asset indices in Nigeria.

MATERIAL AND METHODS

The Study Area

Nigeria comprises of 36 states and its Federal Capital Territory, Abuja. It comprises of 774 constitutionally recognized Local Government Areas. Nigeria is located in West Africa and shares land borders with the Republic of Benin in the west, Chad and Cameroon in the east, and Niger In the north. Its coast in the south lies on the Gulf of Guinea on the Atlantic Ocean. Nigeria has more than 250 ethnic groups, with varying languages and customs, creating a country of rich ethnic diversity. The three largest and most influential ethnic groups in Nigeria are the Hausa, Igbo and Yoruba. In terms of religion Nigeria is roughly split half and half between Muslims and Christians with a very small minority who practice traditional religion. Nigeria is the most populous country in Africa, the seventh most populous country in the world, and the most populous country in the world in which the majority of the population is Black. The United Nations estimates that the population in 2009 was at 154,729,000, distributed as 51.7% rural and 48.3% urban, and with a population density of 167.5 people per square kilometer.

The Data

The study made use of survey based DHS for 1999, 2003 and 2008. The 1999 National Demographic Sample survey was designed as probability sampling of eligible respondents within all regular households in the entire country. The sampling frame used for selecting the Primary Sampling Units (PSUs) was the Enumeration Areas (EAs) into which the country was delineated for the 1991 National Population Cen-

sus. The frame contains 212,079 EAs that are mutually exclusive and collectively exhaustive of the territorial land area of Nigeria. The 36 states and Federal Capital Territory (FCT) of the country were grouped into five Survey Statistical regions. The 212,079 EAs were classified into rural and urban strata, where urban EA (U) is defined as an EA within a locality having population of 20,000 and above, while rural EA (R) is an EA within a locality with population less than 20,000 persons. A total of 7919 households were interviewed comprising 5319 from rural areas and 2600 from urban areas.

In the DHS for 2003, the sample frame was the list of enumeration areas (EAs) developed for the 1991 Population Census. Administratively, at the time the survey was planned, Nigeria was divided into 36 states and the Federal Capital Territory (FCT) of Abuja. Each state was subdivided into local government area (LGA) units and each LGA was divided into localities. In addition to these administrative units, for implementation of the 1991 Population Census, each locality was subdivided into enumeration areas (EAs). The list of approximately 212,080 EAs, with household and population information (from the 1991census) for each EA, was evaluated as a potential sampling frame for the 2003 NDHS. The EAs are grouped by states, by LGAs within a state, and by localities within an LGA, stratified separately by urban and rural areas. Any locality with less than 20,000 population constitutes a rural area. Also available from the 1991 census were maps showing the location of the EAs. A total of 7684 households were sampled.

In 2008, the sampling frame that was used for the 2008 DHS was the 2006 Population and Housing Census of the Federal Republic of Nigeria conducted in 2006. This was provided by the National Population Commission (NPC). Administratively, Nigeria is divided into states. Each state is subdivided into local government areas (LGAs), and each LGA is divided into localities. In addition to these administrative units, during the 2006 Population Census, each locality was subdivided into convenient areas called census enumeration areas (EAs). The primary sampling unit (PSU), referred to as a cluster for the 2008 NDHS, is defined on the basis of EAs from the 2006 EA census frame. The 2008 NDHS sample was selected using a stratified two-stage cluster design consisting of 888 clusters, 286 in the urban and 602 in the rural areas. A representative sample of 36,800 households was selected for the 2008 NDHS survey, with a minimum target of 950 completed interviews per state. In each state, the number of households was distributed proportionately among its urban and rural areas.

Computation of Non-income Welfare Indices

In this study, as part of objective one, indices of multidimensional non-income wealth indices (CWI) were computed using the Fuzzy Set theory originally developed by Zadeh (1965). This approach had been widely applied to poverty analysis by authors like Cerioli and Zani (1990), Martinetti (2000), Costa (2002), Dagum (2002), Costa (2003), and Berenger (2010) among others. Berenger (2010) noted that in terms of integrating the vague and complex nature of poverty, fuzzy sets theory is very advantageous. Therefore, instead of dividing the population between poor and non poor, fuzzy approach takes into account a continuum of situations between these two extremes. Zadeh (1965) characterized a fuzzy set as a class with a continuum of grades of membership. Therefore, in a population A of n households [$A = a_1, a_2, a_3, \ldots\ldots a_n$], the subset of poor households B includes any household $a_i \in B$. These households present some degree of deprivation in some of the m poverty attributes (X).

μ_B

The welfare attributes considered in this study are based on the DHS data. Following Costa (2002), the degree of being poor by the ith household (i=1,….,n) with respect to a particular attribute (j) given that (j = 1,……,m) is defined as: $[X_j (a_i)] = x_{ij}$, 0 d" x_{ij} d" 1. Specifically, $x_{ij} = 0$ when the household does not possess welfare enhancing attribute and $x_{ij} = 1$ when the household possesses it. Betti et al. (2005) noted that putting together categorical indicators of deprivation for individual items to construct composite indices requires decisions about assigning numerical values to the ordered categories and the weighting and scaling of the measures. Individual items indicating non-monetary deprivation often take the form of simple 'yes/no' dichotomies. In this case x_{ij} is 0 or 1.

However, some items may involve more than two ordered categories, reflecting different degrees of deprivation. Consider the general case of c = 1 to C ordered categories of some depriva-

tion indicator, with c = 1 representing the most deprived and c = C the least deprived situation. Let c_i be the category to which individual *i* belongs. Cerioli and Zani (1990), assuming that the rank of the categories represents an equally-spaced metric variable, assigned to the individual a deprivation score as:

$x_{ij} = (C-ci)/(C-1)$.....1

where 1 d" c_i d"C. Therefore, x_{ij} needs not to be compulsorily 0 or 1, but 0 d" x_{ij} d" 1 when there are many categories of the jth indicator and the household possesses the attribute with intensity. Details of the welfare attributes that were used is contained in table 3.

The multidimensional welfare index of a household, (a_i), which shows the level of welfare and membership to set B is defined as the weighted average of x_{ij},

$$\mu_B(a_i) = \sum_{j=1}^{m} x_{ij} w_j / \sum_{j=1}^{m} w_j \quad \text{.....2}$$

w_i is the weight attached to the j-th attribute.

The intensity of deprivation with respect to X_j is measured by the weight w_j. It is an inverse function of the degree of deprivation and the smaller the number of households and the amount of their deprivation, the greater the weight. In practice, a weight that fulfils the above property had been proposed by Cerioli and Zani (1990). This can be expressed as:

$$w_j = \log\left[\sum_{i=1}^{n} g(a_i) / \sum_{i=1}^{n} x_{ij}\, g(a_i)\right] \quad \text{.....3}$$

Ideally, $g(a_i)\Sigma/> 0$ and $g(a_i)\,\Sigma\,/$ is the relative frequency represented by the sample observation a_i in the total population. Therefore when x_{ij}=0, the welfare attribute should be removed.

RESULTS AND DISCUSSION

Construction of Composite Welfare Indices and Access by the Poor

Fuzzy set method was used to construct composite welfare indices (CWI) for each of the households using the selected fifteen welfare attributes. This was necessitated by inability to find comparable welfare indices in the three datasets. Precisely, the 1999 DHS survey did not incorporate asset index variable, while the 2003 and 2008 datasets did. Using the available constructed asset indices will limit the analysis to two years (2003 and 2008). However, because major economic reforms of the democratic government started since late 1999, it is important to include the 1999 survey dataset in order to have a reasonable trend of analysis. Similarly, the researchers were faced with the concern of how comparable the asset indices in the 2003 and 2008 datasets are. This is due to the different array of household assets that the two datasets contain with 2008 data having wider coverage. To therefore ensure comparability across time, they constructed composite welfare indices that integrate similarly coded attributes using the fuzzy set method.

At the first stage, attributes that were common to all the three datasets were carefully selected. The selected attributes are sources of drinking water {for which our definition of improved sources is derived from UNICEF (2010) as households' pipe connections, public standpipes, borehole, protected dug wells, protected springs and rainwater, while unimproved sources are unprotected wells, unprotected springs, vendor-provided water, bottled water and tanker truck provided water}, sanitation (with improved sanitation defined as connections to public sewers, connection to septic systems, pour-flush latrines, simple pit latrines and ventilated improved pit latrines, unimproved sources are bucket latrines, public latrines and open latrines), main floor material (with finished type classified as improved while rudimentary types are unimproved sources) , rooms per person, electricity, ownership of radio, ownership of television, ownership of refrigerator, ownership of telephone, attainment of formal education, ownership of motor car, ownership of electric iron, ownership of electric fan, ownership of bicycle and ownership of motorcycle. The definition of poverty for each attribute and the weight of the attributes are provided in Table 1. The table also shows that across the years covered by the surveys, attributes with highest weights are ownership of mobile phone (in 1999 and 2003 only), motor cars, motorcycle and refrigerator.

Tables 2, 3 and 4 provide a profile of CWI quartiles distribution in relation to households' access to basic welfare attributes in the national, urban and rural sectors respectively. At the national level, Table 2 shows that attainment of formal education among the household heads slightly increased across the years with 56.62 percent, 56.65 percent and 59.93 percent in 1999, 2003 and 2008 respectively. Table 3 shows that in the urban sector, the proportions of urban households that belong to the poorest quartiles

Table 1: Fuzzy assigned weights for the selected welfare attributes

Attribute	*Coding*	*1999 Weight*	*2003 Weight*	*2008 Weight*
Source of drinking water	Improved source =1Unimproved =0	0.164	0.361	0.263
Toilet	Improved method =1Unimproved =0	0.138	0.146	0.310
Floor of the house	Improved material =1Unimproved =0	0.204	0.175	0.220
Room (s) per person	One or more per person =1Less than one per person =0	0.673	0.455	0.382
Electricity	Yes =1, No = 0	0.339	0.289	0.341
Radio	Yes =1, No = 0	0.204	0.136	0.138
Television	Yes =1, No = 0	0.582	0.515	0.452
Refrigerator	Yes =1, No = 0	0.805	0.756	0.862
Telephone	Yes =1, No = 0	1.740	1.257	0.342
Formal education	Yes =1, No = 0	0.247	0.247	0.222
Car	Yes =1, No = 0	1.107	1.017	1.125
Iron	Yes =1, No = 0	0.602	0.512	0.541
Fan	Yes =1, No = 0	0.498	0.432	0.434
Bicycle	Yes =1, No = 0	0.622	0.479	0.624
Motorcycle	Yes =1, No = 0	0.867	0.805	0.600

Source: Authors' computations

(first and second) are lower than those in the third and fourth quartiles. The contrary applies to rural sector. This is further stressing the fact that welfare among rural dwellers is lower than that in Nigeria's urban sector.

However, Tables 3 and 4 also show that in the urban and rural sectors, house heads' attainment of formal education (total for all the quartiles) declined throughout the years. In the urban sector (Table 4), proportions of the house heads with formal education were 72.08 percent, 67.93 percent and 51.69 percent in 1999, 2003 and 2008, respectively. This can be compared to the rural sector (Table 4) where attainment of formal education by the household heads declined from 49.06 percent in 1999 to 48.95 percent and 29.71 percent in 2003 and 2008, respectively. It should be noted that majority of the households in the first and second quartile of the results for national, urban and rural areas did not attain formal education in all the years. The contrary is also applicable for the third and fourth quartiles.

Table 2 shows that national access to improved drinking water sources in Nigeria declined from 68.54 percent in 1999 to 43.54 percent in 2003, before increasing to 54.59 percent in 2008. It should be noted that from table 3, urban sector has higher access to improved sources of drinking water with 89.32 percent, 63.05 percent and 79.36 percent in 1999, 2003 and 2008, respectively as against 58.55 percent, 30.20 percent and 43.20 percent for the rural sector (Table 4). In the urban sector, Table 3 further reveals that majority of the poorest population (5.12 percent) have access to improved water sources in 1999, but this is not the case in 2003 and 2008 when 2.59 percent and 2.29 percent respectively lacked access. Similar findings are recorded for the rural sector (Table 4) where access to improved drinking water sources by the poor declined between 1999 and 2008. It is striking to find that the percentage of rural households in the poorest quartiles without access to improved water sources increased from 14.79 percent in 1999 to 31.04 percent in 2003 before declined to 26.22 percent in 2008. As expected, however, Tables 2 and 3 shows that majority of those in the richest group (fourth quartile) in both urban and rural have access to improved drinking water sources in all the years.

In the national data, Table 2 further shows that access to improved water sources in the poorest quartiles (first and second) declined from 30.47 percent in 1999 to 11.65 percent in 2003, before slightly increasing to 17.08 percent in 2008. Among the richest quartiles (third and fourth), however, access to improved water sources declined from 38.07 percent in 1999 to 31.89 percent in 2003 after which it increased to 37.51 percent in 2008. These findings reveal that although access to safe drinking water sources has declined between 1999 and 2008 across the different wealth quartiles, the poor households have suffered severely. This is rather worrisome despite several investments and commitments made by the government to ensure people's access to basic social amenities. Acey (2006)

Table 2: Percentage distribution of households' access to social amenities and assets across the quartiles of CWI in Nigeria (1999-2008)

Basic infrastructure services/ assets	*1999 Welfare quartiles*				*2003 Welfare quartiles*				*2008 Welfare quartiles*			
	1st	*2nd*	*3rd*	*4th*	*1st*	*2nd*	*3rd*	*4th*	*1st*	*2nd*	*3rd*	*4th*
Unimproved source of drinking water	11.00	8.55	7.91	4.01	21.27	17.08	11.40	6.71	19.03	13.89	8.65	3.84
Improved source of drinking water	14.01	16.46	17.09	20.99	3.73	7.92	13.60	18.29	5.97	11.11	16.35	21.16
Unimproved toilet	12.42	7.26	4.92	2.68	15.89	7.64	4.15	0.86	21.03	15.53	10.68	3.75
Improved toilet	12.58	17.76	20.07	22.31	9.12	17.36	20.86	24.12	3.97	9.47	14.32	21.25
Natural/ rudimentary floor	19.48	12.38	4.64	1.16	19.06	9.44	3.93	0.80	20.93	13.35	5.10	0.93
Finished floor	5.52	12.63	20.35	23.83	5.95	15.56	21.08	24.18	4.07	11.66	19.90	24.07
Less than 1 room per person	24.60	18.87	16.91	18.39	23.18	15.81	13.45	12.51	18.46	14.12	13.39	12.57
One room or more per person	0.41	6.15	8.08	6.60	1.83	9.19	11.56	12.47	6.54	10.88	11.61	12.43
No electricity	24.10	18.82	9.76	1.50	22.67	16.66	8.21	1.04	24.05	19.16	9.27	1.93
Electricity	0.90	6.20	15.23	23.49	2.34	8.33	16.80	23.94	0.95	5.84	15.73	23.06
No radio	19.05	12.20	5.44	0.73	13.55	8.79	3.79	0.83	14.10	8.26	4.02	0.89
Radio	5.95	12.82	19.55	24.26	11.46	16.21	21.22	24.15	10.90	16.74	20.98	24.11
No television	25.00	24.85	20.11	3.86	25.01	24.03	17.02	3.39	24.94	24.02	14.28	1.48
Television	0.00	0.17	4.88	21.13	0.00	0.97	7.99	21.59	0.06	0.98	10.72	23.52
No refrigerator	25.00	25.00	24.39	9.95	25.01	24.97	23.06	9.44	25.00	24.99	24.36	11.92
Refrigerator	0.00	0.01	0.60	15.04	0.00	0.03	1.95	15.54	0.00	0.01	0.64	13.08
No telephone	25.00	25.02	24.98	23.19	25.01	25.00	24.97	19.49	24.23	19.90	9.12	1.26
Telephone	0.00	0.00	0.01	1.80	0.00	0.00	0.04	5.49	0.77	5.10	15.88	23.74
No formal education	18.99	13.99	7.68	2.81	19.39	13.66	7.72	2.57	18.35	12.69	6.69	2.35
Formal education	6.02	11.02	17.31	22.18	5.62	11.34	17.29	22.41	6.65	12.32	18.31	22.65
No car	25.00	24.99	24.07	18.11	25.01	24.83	23.86	16.68	25.00	24.93	24.30	18.28
Car	0.00	0.03	0.92	6.88	0.00	0.17	1.15	8.30	0.00	0.08	0.70	6.72
No iron	25.00	24.98	21.22	3.81	24.89	24.03	17.27	3.03	25.00	24.90	18.70	2.66
Iron	0.00	0.04	3.77	21.18	0.12	0.97	7.74	21.95	0.00	0.11	6.30	22.34
No fan	25.00	24.51	16.82	1.94	24.90	23.27	13.59	1.25	24.99	24.30	13.06	0.86
Fan	0.00	0.51	8.17	23.05	0.11	1.73	11.42	23.74	0.01	0.70	11.93	24.14
No bicycle	24.64	15.67	16.18	19.64	18.51	14.74	15.35	18.20	23.11	16.16	17.02	19.93
Bicycle	0.37	9.35	8.81	5.35	6.51	10.26	9.66	6.78	1.90	8.84	7.98	5.07
No motorcycle	25.00	24.24	19.69	17.47	24.84	22.89	19.94	16.64	24.39	19.89	16.08	14.52
Motorcycle	0.00	0.77	5.30	7.52	0.17	2.10	5.07	8.35	0.61	5.11	8.92	10.48

Source: Authors' computations from 1999, 2003 and 2008 DHS data

submitted that the WHO/UNICEF Joint Monitoring Programme noted that despite that urban population in Nigeria increased from 35 percent to 48 percent between 1990 and 2004 respectively, access to improved water sources actually declined from 80 percent to 67 percent.

Furthermore, Table 2 shows that national access to improved sanitation (toilet) slightly declined from 72.72 percent in 1999 to 71.46 percent in 2003 before rapidly declining to 49.01 percent in 2008. The table also reveals that in the poorest quartile, the proportion of households with access to improved sanitation declined from 12.58 percent in 1999 to 9.12 percent and 3.97 percent in 2003 and 2008 respectively. This is contrary to what obtains in the richest quartile where access increased from 22.31 percent in 1999 to 24.12 percent in 2003 before slightly declined to 21.25 percent in 2008. It should also be noted that urban households' access to improved sanitation are 85.70 percent, 87.17 percent and 73.89 percent in 1999, 2003 and 2008 respectively as against 66.49 percent, 60.74 percent, 37.58 percent for the rural areas. In Table 3, higher proportions of the urban poorest groups (first and second quartiles) have access to improved sanitation in 1999 and 2003, but a contrary is observed in 2008. However, Table 4 shows that in the rural sector, the majority in the poorest quartile lacked access to improved sanitation in all the years.

Table 3: Percentage distribution of households' access to social amenities and assets across the quartiles of CWI in urban Nigeria (1999-2008)

Basic infrastructure services/ assets	*1999 Welfare quartiles*				*2003 Welfare quartiles*				*2008 Welfare quartiles*			
	1st	*2nd*	*3rd*	*4th*	*1st*	*2nd*	*3rd*	*4th*	*1st*	*2nd*	*3rd*	*4th*
Unimproved source of drinking water	3.10	2.22	2.78	2.58	6.96	9.52	10.54	9.93	3.38	4.57	6.67	6.02
Improved source of drinking water	5.12	12.73	25.06	46.41	2.59	7.51	19.58	33.37	2.29	8.54	23.24	45.29
Unimproved toilet	3.67	3.38	4.39	2.86	4.67	3.65	3.41	1.09	4.55	6.78	9.40	5.38
Improved toilet	4.55	11.56	23.45	46.13	4.88	13.37	26.71	42.20	1.13	6.33	20.51	45.93
Natural/ rudimentary floor	4.19	3.55	2.62	1.25	5.19	4.47	2.87	1.06	3.66	4.01	3.29	1.37
Finished floor	4.03	11.40	25.22	47.74	4.37	12.56	27.26	42.24	2.02	9.10	26.61	49.93
Less than 1 room per person	8.18	12.41	21.80	37.91	9.25	12.18	19.82	23.40	4.42	7.76	18.57	26.83
One room or more per person	0.04	2.54	6.04	11.08	0.31	4.84	10.30	19.89	1.26	5.35	11.34	24.48
No electricity	7.33	5.76	2.90	0.36	7.34	8.26	4.40	0.72	5.03	6.59	4.21	1.88
Electricity	0.89	9.19	24.94	48.63	2.22	8.77	25.73	42.58	0.65	6.52	25.69	49.42
No radio	6.57	7.86	6.37	1.53	4.95	5.94	4.64	1.57	3.74	5.59	5.82	1.93
Radio	1.65	7.09	21.47	47.46	4.61	11.09	25.49	41.73	1.94	7.52	24.09	49.38
No television	8.22	14.59	19.38	5.76	9.55	15.86	16.89	4.57	5.65	12.56	13.65	2.00
Television	0.00	0.36	8.46	43.23	0.00	1.16	13.24	38.72	0.03	0.55	16.25	49.31
No refrigerator	8.22	14.95	26.95	16.80	9.55	16.99	26.68	14.40	5.68	13.10	28.96	21.87
Refrigerator	0.00	0.00	0.89	32.19	0.00	0.03	3.45	28.90	0.00	0.01	0.94	29.44
No telephone	8.22	14.95	27.80	43.88	9.55	17.02	30.09	32.96	5.51	10.15	8.60	2.03
Telephone	0.00	0.00	0.04	5.12	0.00	0.00	0.03	10.34	0.17	2.96	21.31	49.27
No formal education	6.45	7.98	9.19	4.31	7.68	10.27	9.86	4.26	4.22	7.01	8.11	4.45
Formal education	1.77	6.97	18.65	44.68	1.88	6.76	20.27	39.03	1.45	6.10	21.79	46.86
No car	8.22	14.95	27.03	35.01	9.55	16.96	29.03	29.00	5.68	13.07	29.43	37.09
Car	0.00	0.00	0.81	13.98	0.00	0.07	1.09	14.30	0.00	0.04	0.48	14.21
No iron	8.22	14.91	21.43	5.76	9.45	15.93	17.60	4.47	5.68	12.98	18.72	3.57
Iron	0.00	0.04	6.41	43.23	0.10	1.09	12.52	38.83	0.00	0.13	11.18	47.73
No fan	8.22	13.98	11.48	2.18	9.42	14.84	10.54	1.36	5.67	12.48	9.75	0.90
Fan	0.00	0.97	16.36	46.82	0.14	2.18	19.58	41.93	0.01	0.63	20.15	50.40
No bicycle	8.14	13.01	24.66	44.24	7.27	12.35	23.61	35.41	5.40	10.85	26.00	45.64
Bicycle	0.08	1.93	3.18	4.75	2.29	4.67	6.52	7.88	0.28	2.26	3.91	5.67
No motorcycle	8.22	14.83	25.14	37.43	9.55	15.73	25.86	30.43	5.62	11.80	23.61	33.48
Motorcycle	0.00	0.12	2.70	11.56	0.00	1.30	4.26	12.86	0.06	1.31	6.29	17.83

Source: Authors' computations from 1999, 2003 and 2008 DHS data

The above findings can be further substantiated with the fact that the failing water system is a major factor responsible for poor sanitation system in the country (WaterAid 2009). Hull (2006) also noted that sanitation can be considered as a major household problem in Nigeria, especially among those in the rural areas. Existing infrastructure are largely deficient with only Abuja and limited areas in Lagos state having sewerage system (African Development Bank 2005). Therefore, WHO/UNICEF (2006) submitted that Nigeria is not on track to meet the MDG target for sanitation of 70 percent access by 2015. United Nations sources estimate that in the last 15 years, rural sanitation access rates have risen just 3 percent from 33 percent in 1990, to 36 percent in 2004, while urban sanitation access has gone from 51 percent to 53 percent. WaterAid (2009) noted that poor sanitation is also a major contributing factor to low education enrolment and achievement rates, malnutrition, lagging economic and social development, and to poverty as a whole.

Another important welfare attribute is the nature of floor material of the dwelling, which if rudimentary can constitute a lot of welfare losses to household members. At the national level, Table 2 shows that access to finished floor increased from 62.33 percent in 1999 to 66.77 percent in 2003, before declined to 59.70 percent in 2008. Out of the 25 percent proportion that households in the poorest quartile constitute in the national data, only 5.52 percent had access to finished floor material. As expected, urban

Table 4: Percentage distribution of households' access to social amenities and assets across the quartiles of CWI in rural Nigeria (1999-2008)

Basic infrastructure services/ assets	*1999 Welfare quartiles*				*2003 Welfare quartiles*				*2008 Welfare quartiles*			
	1st	*2nd*	*3rd*	*4th*	*1st*	*2nd*	*3rd*	*4th*	*1st*	*2nd*	*3rd*	*4th*
Unimproved source of drinking water	14.79	11.60	10.36	4.70	31.04	22.24	11.99	4.52	26.22	18.18	9.56	2.84
Improved source of drinking water	18.28	18.26	13.26	8.75	4.52	8.20	9.52	7.96	7.65	12.28	13.19	10.07
Unimproved toilet	16.63	9.12	5.17	2.59	23.54	10.36	4.66	0.70	28.60	19.55	11.27	3.00
Improved toilet	16.44	20.74	18.45	10.86	12.02	20.07	16.86	11.78	5.28	10.91	11.48	9.92
Natural/ rudimentary floor	26.83	16.63	5.61	1.12	28.53	12.83	4.66	0.63	28.87	17.63	5.92	0.73
Finished floor	6.23	13.22	18.01	12.33	7.03	17.61	16.86	11.85	5.01	12.83	16.82	12.19
Less than 1 room per person	32.49	21.97	14.56	9.00	32.70	18.28	9.11	5.08	24.91	17.04	11.01	6.02
One room or more per person	0.58	7.88	9.06	4.45	2.86	12.16	12.41	7.41	8.97	13.42	11.74	6.90
No electricity	32.16	25.09	13.05	2.05	33.14	22.40	10.81	1.26	32.79	24.94	11.59	1.96
Electricity	0.91	4.76	10.57	11.40	2.42	8.03	10.71	11.22	1.09	5.53	11.16	10.96
No radio	25.05	14.29	5.00	0.35	19.42	10.74	3.21	0.33	18.86	9.48	3.19	0.41
Radio	8.02	15.57	18.63	13.11	16.14	19.70	18.30	12.16	15.01	20.98	19.56	12.50
No television	33.07	29.78	20.46	2.94	35.56	29.60	17.12	2.59	33.80	29.29	14.57	1.24
Television	0.00	0.08	3.16	10.51	0.00	0.84	4.40	9.90	0.08	1.18	8.18	11.68
No refrigerator	33.07	29.84	23.16	6.66	35.56	30.41	20.59	6.05	33.88	30.45	22.25	7.35
Refrigerator	0.00	0.02	0.46	6.80	0.00	0.02	0.93	6.43	0.00	0.01	0.50	5.56
No telephone	33.07	29.85	23.62	13.24	35.56	30.44	21.47	10.29	32.83	24.37	9.36	0.90
Telephone	0.00	0.00	0.00	0.21	0.00	0.00	0.05	2.19	1.05	6.09	13.38	12.01
No formal education	25.01	16.88	6.95	2.09	27.39	15.98	6.26	1.42	24.84	15.29	6.03	1.39
Formal education	8.05	12.97	16.67	11.36	8.17	14.46	15.25	11.06	9.04	15.17	16.71	11.53
No car	33.07	29.82	22.65	9.99	35.56	30.20	20.33	8.27	33.88	30.37	21.94	9.64
Car	0.00	0.04	0.97	3.47	0.00	0.23	1.19	4.22	0.00	0.09	0.80	3.28
No iron	33.07	29.82	21.12	2.87	35.42	29.55	17.05	2.05	33.87	30.37	18.69	2.24
Iron	0.00	0.04	2.50	10.59	0.14	0.88	4.47	10.43	0.00	0.09	4.06	10.67
No fan	33.07	29.56	19.38	1.82	35.47	29.02	15.67	1.16	33.86	29.73	14.58	0.84
Fan	0.00	0.29	4.24	11.64	0.09	1.42	5.85	11.32	0.01	0.73	8.16	12.07
No bicycle	32.57	16.94	12.10	7.82	26.18	16.37	9.71	6.45	31.24	18.60	12.89	8.12
Bicycle	0.50	12.91	11.52	5.63	9.39	14.07	11.81	6.03	2.64	11.86	9.85	4.79
No motorcycle	33.07	28.77	17.08	7.88	35.28	27.78	15.91	7.22	33.02	23.61	12.62	5.81
Motorcycle	0.00	1.08	6.54	5.58	0.28	2.65	5.61	5.26	0.86	6.85	10.12	7.11

Source: Authors' computations from 1999, 2003 and 2008 DHS data

households fare better in access to improved floor material with 88.54 percent, 86.44 percent and 87.78 percent in 1999, 2003 and 2008 (Table 3), respectively as against 49.79 percent, 53.35 percent and 46.85 percent for the rural households (Table 4). It is also observed that in the poorest group (first quartile), Tables 3 and 4 show that access to finished floor among households in urban and rural sectors respectively is lower in all the years. This further gives an indication of deprivation in major housing attribute that the poorest quartile suffers in all the sectors of the economy. Living condition with respect to number of rooms per person does not show much difference between urban and rural areas. Specifically, in the urban areas, 19.70 percent, 35.35 percent and 42.43 percent respectively have access to one or more rooms per person in 1999, 2003 and 2008, compared to 21.97 percent, 34.84 percent and 41.03 percent for the rural areas. Although in all the results, those without access to one room or more per person constitute the higher proportion, access is worst in the poorest quartile.

Nubi (2008) submitted that housing means more than shelter because it serves as one of the best indicators of a person's standard of living. However, in most Nigeria urban and rural areas, housing constitutes a major barrier to household welfare due to progressively widening gaps between its supply and demand. Several housing programmes have been sponsored

Table 5: Means and standard deviations of CWI

Year/State/Zone	*1999*				*2003*				*2008*			
	Freq	*%*	*Mean*	*Std dev*	*Freq*	*%*	*Mean*	*Std dev*	*Freq*	*%*	*Mean*	*Std dev*
Akwa Ibom	641	8.38	0.250	0.158	183	2.53	0.341	0.191	928	2.72	0.398	0.214
Anambra	189	2.47	0.302	0.174	255	3.53	0.456	0.230	837	2.46	0.490	0.203
Bauchi	154	2.01	0.121	0.157	370	5.12	0.177	0.165	922	2.71	0.169	0.152
Edo	189	2.47	0.229	0.189	151	2.09	0.467	0.231	883	2.59	0.445	0.220
Benue	340	4.45	0.193	0.155	292	4.04	0.260	0.178	890	2.61	0.209	0.171
Borno	148	1.94	0.145	0.156	231	3.20	0.341	0.220	955	2.80	0.215	0.191
Cross Rivers	113	1.48	0.172	0.179	130	1.80	0.304	0.203	817	2.40	0.250	0.201
Adamawa	142	1.86	0.138	0.142	189	2.62	0.290	0.194	906	2.66	0.227	0.186
Imo	197	2.58	0.292	0.177	232	3.21	0.464	0.220	770	2.26	0.417	0.224
Kaduna	291	3.81	0.203	0.153	361	5.00	0.335	0.224	951	2.79	0.342	0.220
Kano	476	6.22	0.179	0.143	369	5.11	0.380	0.215	1,178	3.46	0.304	0.215
Katsina	307	4.01	0.162	0.145	246	3.40	0.291	0.190	977	2.87	0.211	0.160
Kwara	112	1.46	0.250	0.172	149	2.06	0.445	0.223	827	2.43	0.317	0.241
Lagos	401	5.24	0.386	0.171	383	5.30	0.560	0.191	1,304	3.83	0.534	0.174
Niger	208	2.72	0.243	0.183	211	2.92	0.302	0.203	904	2.65	0.319	0.226
Ogun	275	3.60	0.261	0.168	181	2.51	0.307	0.220	948	2.78	0.333	0.200
Ondo	173	2.26	0.235	0.172	142	1.97	0.246	0.195	953	2.80	0.324	0.228
Oyo	407	5.32	0.233	0.187	272	3.76	0.261	0.225	975	2.86	0.351	0.208
Plateau	200	2.62	0.183	0.154	194	2.69	0.329	0.215	930	2.73	0.227	0.175
Rivers	198	2.59	0.242	0.163	280	3.88	0.460	0.235	932	2.74	0.396	0.226
Sokoto	160	2.09	0.058	0.058	144	1.99	0.152	0.160	952	2.79	0.186	0.185
Abia	131	1.71	0.263	0.169	165	2.28	0.361	0.211	791	2.32	0.463	0.200
Delta	190	2.48	0.310	0.211	205	2.84	0.390	0.219	930	2.73	0.384	0.216
Enugu	146	1.91	0.126	0.103	233	3.22	0.330	0.241	835	2.45	0.322	0.220
Jigawa	160	2.09	0.074	0.052	176	2.44	0.138	0.096	930	2.73	0.163	0.152
Kebbi	163	2.13	0.085	0.073	130	1.80	0.140	0.135	900	2.64	0.214	0.184
Kogi	230	3.01	0.275	0.176	183	2.53	0.358	0.221	983	2.89	0.346	0.207
Osun	211	2.76	0.297	0.201	172	2.38	0.305	0.182	970	2.85	0.363	0.223
Taraba	175	2.29	0.227	0.194	141	1.95	0.211	0.132	902	2.65	0.184	0.168
Yobe	157	2.05	0.131	0.134	128	1.77	0.320	0.200	878	2.58	0.158	0.158
Bayelsa	58	0.76	0.232	0.159	61	0.84	0.169	0.132	899	2.64	0.255	0.185
Ebonyi	143	1.87	0.124	0.107	150	2.08	0.173	0.104	898	2.64	0.270	0.198
Ekiti	106	1.39	0.176	0.129	105	1.45	0.285	0.186	940	2.76	0.354	0.208
Gombe	101	1.32	0.122	0.132	132	1.83	0.234	0.192	895	2.63	0.197	0.174
Nassarawa	79	1.03	0.192	0.154	89	1.23	0.273	0.164	863	2.53	0.309	0.192
Zamfara	201	2.63	0.095	0.111	150	2.08	0.220	0.149	854	2.51	0.178	0.199
FCT	75	0.98	0.287	0.193	40	0.55	0.488	0.184	863	2.53	0.497	0.231
NC	1244	16.27	0.226	0.172	1,158	16.03	0.327	0.212	6,260	18.37	0.317	0.224
NE	877	11.47	0.151	0.161	1,191	16.48	0.253	0.196	5,458	16.02	0.192	0.174
NW	1758	22.99	0.141	0.135	1,576	21.81	0.273	0.209	6,742	19.79	0.232	0.200
SE	806	10.54	0.230	0.172	1,035	14.33	0.373	0.235	4,131	12.13	0.389	0.226
SS	1389	18.16	0.247	0.175	1,010	13.98	0.388	0.229	5,389	15.82	0.357	0.223
SW	1573	20.57	0.282	0.189	1,255	17.37	0.365	0.240	6,090	17.87	0.386	0.220
Urban	2,482	32.46	0.321	0.188	2,931	40.57	0.438	0.224	10,724	31.48	0.466	0.211
Rural	5,165	67.54	0.162	0.143	4,294	59.43	0.248	0.192	23,346	68.52	0.235	0.190
Total	76477,647		0.214	0.176	7,225	100	0.325	0.225	34,070	100	0.307	0.224

Source: Authors' computations from 1999, 2003 and 2008 DHS data

by the Nigerian Federal or State Governments. However, due to rapidly increasing population and poverty, those houses are not able to meet the demand of the people, and many of the times, the poor cannot meet the stringent financial conditions under which they could be enlisted as beneficiaries.

Furthermore, electricity is the bane of private sector development in Nigeria. It also constitutes a great necessity for domestic activities. The results in Table 2 show that national access to electricity increased from 45.82 percent in 1999 to 51.41 percent in 2003, before it declined to 45.58 percent in 2008. The poorest

Table 6: Means of CWI across different quartiles

Year/State/Zone	*1999*				*2003*				*2008*			
	Q^1	*Q^2*	*Q^3*	*Q^4*	*Q^1*	*Q^2*	*Q^3*	*Q^4*	*Q^1*	*Q^2*	*Q^3*	*Q^4*
Akwa Ibom	*0.050*	*0.118*	*0.222*	*0.454*	0.098	0.214	0.357	0.623	0.079	0.189	0.356	0.637
Anambra	0.057	0.122	0.230	0.465	0.089	0.212	0.367	0.704	0.077	0.180	0.363	0.631
Bauchi	0.031	0.107	0.208	0.542	0.078	0.208	0.345	0.626	0.064	0.174	0.325	0.665
Edo	0.031	0.113	0.222	0.463	0.101	0.210	0.360	0.663	0.068	0.183	0.370	0.628
Benue	0.045	0.116	0.223	0.499	0.076	0.214	0.352	0.594	0.068	0.174	0.340	0.616
Borno	0.044	0.118	0.206	0.560	0.086	0.207	0.346	0.627	0.059	0.180	0.333	0.621
Cross Rivers	0.040	0.122	0.212	0.517	0.090	0.210	0.362	0.630	0.063	0.176	0.350	0.610
Adamawa	0.033	0.118	0.214	0.480	0.092	0.211	0.337	0.621	0.066	0.180	0.342	0.621
Imo	0.051	0.119	0.223	0.487	0.090	0.219	0.366	0.670	0.092	0.191	0.345	0.674
Kaduna	0.054	0.126	0.218	0.474	0.103	0.200	0.356	0.678	0.079	0.184	0.339	0.650
Kano	0.047	0.117	0.223	0.453	0.104	0.210	0.360	0.628	0.079	0.181	0.335	0.656
Katsina	0.042	0.118	0.220	0.456	0.091	0.208	0.360	0.608	0.060	0.182	0.334	0.629
Kwara	0.047	0.118	0.235	0.463	0.101	0.219	0.379	0.646	0.060	0.177	0.380	0.621
Lagos	0.059	0.130	0.242	0.477	0.085	0.223	0.386	0.665	0.078	0.179	0.395	0.618
Niger	0.040	0.118	0.227	0.483	0.083	0.213	0.342	0.614	0.070	0.184	0.336	0.658
Ogun	0.046	0.121	0.236	0.438	0.082	0.201	0.358	0.609	0.077	0.179	0.360	0.575
Ondo	0.035	0.123	0.226	0.458	0.084	0.211	0.365	0.619	0.063	0.178	0.349	0.609
Oyo	0.036	0.121	0.223	0.467	0.066	0.199	0.355	0.631	0.074	0.180	0.379	0.603
Plateau	0.038	0.123	0.223	0.482	0.094	0.213	0.374	0.633	0.070	0.180	0.332	0.632
Rivers	0.027	0.124	0.223	0.438	0.101	0.208	0.371	0.667	0.075	0.182	0.357	0.647
Sokoto	0.032	0.114	0.191	0.481	0.057	0.201	0.340	0.642	0.063	0.180	0.351	0.650
Abia	0.052	0.136	0.230	0.461	0.097	0.215	0.357	0.650	0.102	0.190	0.364	0.630
Delta	0.036	0.122	0.232	0.484	0.099	0.214	0.356	0.640	0.077	0.183	0.360	0.626
Enugu	0.046	0.123	0.188	0.445	0.084	0.212	0.346	0.681	0.075	0.182	0.343	0.648
Jigawa	0.036	0.116	0.215	-	0.072	0.198	0.330	0.505	0.065	0.171	0.328	0.619
Kebbi	0.037	0.122	0.217	0.428	0.077	0.206	0.345	0.698	0.066	0.175	0.335	0.633
Kogi	0.052	0.120	0.230	0.474	0.101	0.208	0.370	0.658	0.076	0.185	0.352	0.625
Osun	0.043	0.120	0.241	0.505	0.093	0.208	0.347	0.585	0.067	0.181	0.376	0.620
Taraba	0.041	0.114	0.217	0.494	0.099	0.208	0.356	0.624	0.058	0.177	0.336	0.616
Yobe	0.041	0.115	0.220	0.542	0.111	0.206	0.355	0.633	0.053	0.172	0.328	0.594
Bayelsa	0.054	0.117	0.234	0.438	0.081	0.209	0.414	0.557	0.072	0.177	0.352	0.610
Ebonyi	0.033	0.119	0.230	0.375	0.079	0.210	0.326	-	0.067	0.183	0.346	0.608
Ekiti	0.042	0.119	0.222	0.428	0.075	0.210	0.354	0.590	0.073	0.183	0.370	0.612
Gombe	0.031	0.114	0.210	0.465	0.094	0.202	0.338	0.663	0.063	0.174	0.338	0.628
Nassarawa	0.045	0.118	0.228	0.493	0.076	0.212	0.344	0.579	0.075	0.186	0.343	0.622
Zamfara	0.031	0.120	0.218	0.484	0.080	0.213	0.363	0.618	0.068	0.179	0.335	0.714
FCT	0.053	0.114	0.230	0.515	-	0.224	0.404	0.675	0.066	0.182	0.376	0.684
NC	0.044	0.118	0.227	0.484	0.085	0.213	0.362	0.632	0.069	0.181	0.351	0.646
NE	0.037	0.114	0.214	0.509	0.087	0.207	0.346	0.630	0.060	0.176	0.335	0.622
NW	0.039	0.120	0.220	0.462	0.080	0.205	0.356	0.640	0.067	0.179	0.337	0.652
SE	0.043	0.123	0.222	0.466	0.084	0.213	0.358	0.680	0.074	0.185	0.352	0.638
SS	0.039	0.119	0.223	0.462	0.093	0.211	0.363	0.652	0.071	0.181	0.357	0.630
SW	0.040	0.122	0.233	0.470	0.077	0.207	0.366	0.642	0.070	0.180	0.373	0.609
Urban	0.048	0.122	0.233	0.479	0.099	0.212	0.370	0.648	0.076	0.186	0.374	0.635
Rural	0.038	0.119	0.220	0.458	0.081	0.208	0.349	0.646	0.066	0.179	0.339	0.623
Total	0.039	0.119	0.225	0.471	0.084	0.209	0.359	0.647	0.066	0.180	0.353	0.631

(first) quartile shows the highest deprivation with only 0.90 percent, 2.34 percent and 0.95 percent access in 1999, 2003 and 2008, respectively. Similar trend is observed in the second quartile where only 6.20 percent, 8.33 percent and 5.84 percent have access to electricity in 1999, 2003 and 2008, respectively. The fact that in the fourth quartile, only 1.93 percent, 1.04 percent and 1.50 percent lacked access to electricity in 2008, 2003 and 1999, respectively vividly shows that the poor have been seriously deprived. In the urban sector, electricity coverage declined from 83.64 percent in 1999 to 79.29 percent in 2003 before slightly increased to 82.28 percent in 2008 as against 27.65 percent, 32.39 percent and 28.73 percent for the rural sector. In the rural and urban sectors, access to electricity by the poorest quartile fluctuated across the

years with the highest being in 2003. Majority of the households in the third and fourth quartiles also have access to electricity.

The National Electric Power Authority (NEPA), which has been renamed the Power Holding Company of Nigeria (PHCN) as part of the privatization process is the organization responsible for electricity generation and distribution in Nigeria. Hull (2006) submitted that while NEPA's installed generation capacity is 4,200 MW, the maximum available capacity is limited to 3300 MW, mainly due to a lack of adequate maintenance, inefficiency and widespread corruption. Fluctuation in access to electricity more than a decade after democratic governance in Nigeria is worrisome given large budgetary allocations to the Power Sector by the Obasanjo. The consequences of erratic power supply are largely manifesting in the private sector, where many economic activities had been adversely affected due to huge running and maintenance cost of generators. At the household level, private investments in regular electricity supply through generating set and other solar energy devices are luxuries that can only be afforded by the rich.

Communication is one of the major driving forces of economic development in Nigeria since inception of democratic governance in 1999. It is also expected to ensure better welfare in terms of creating opportunities for income generation and growth. The results in Tables 2, 3 and 4 show that access to radio and television in all the analyses (national, urban and rural sectors) increased across the years but highly concentrated in the fourth quartile. Furthermore, it should be noted that while access to telephone in both urban and rural sectors increased across the years, there is a sharp increase between 2003 and 2008 when coverage increased by 63.32 and 30.30 percents respectively in urban and rural areas. However, access by the poorest quartiles (first and second) in urban and rural sectors is very low.

Ndukwe (2005) noted that liberalization of the telecommunication sector had brought a lot of positive growth to the sector. The essence of this development can be better understood by the fact that Information and Communication Technologies (ICT), of which telephone, radio and television belong, can be used as instrument for poverty reduction. Many rural communities have been slowly reached after saturation of networks in urban centers. Penetration of rural communities through ICT is a necessary impetus for exploiting their growth and development potentials to the fullest.

Tables 2, 3 and 4 reveal that access to cars and bicycles slightly fluctuated in all the results, but ownership of motorcycles increased in all the sectors across the years. Access is also concentrated in the wealthiest quartiles. It should be noted that several state governments have promoted access to motorcycles (popularly called *okada*) by granting them as loans to some community groups and members of certain political parties. It is expected that such recent upsurge in the number of motorcycles would have greatly benefited the poorest, but that is not the case. Ownership of refrigerators slightly declined across the years in the urban and rural sectors, while ownership of electric fan increased. Electric iron ownership also shows some fluctuations.

CWI Distribution Across the Zones and States

Table 5 shows some descriptive statistics of the constructed CWI across the states, geo-political zones (GPZ) and urban/rural sectors. It shows that at the national level, in 1999, average CWI for all the households is 0.214. This increased to 0.325 in 2003 before it slightly declined to 0.307 in 2008. These findings are confirmations to the progress made in ensuring poverty reduction in all its ramifications as a result of several economic reforms embarked upon by the Nigerian government since the country returned to democratic governance since 29th May 1999. Okonjo-Iweala and Osafo-Kwaako (2007) specifically noted that with macroeconomic stability that resulted from the economic reforms, economic growth rates have averaged about 7.1 percent annually for the period 2003 to 2006, and attention was also given to pro-poor expenditures within the budget in order to improve the country's performance in some Millennium Development Goals indicators. Also worthy to mention is the fact that several authors (Dijkstra 2011; Iyoha and Oriakhi 2007) have found that the 2005 debt relief that was granted to Nigeria by the Paris Club had a modestly positive effect on economic growth and poverty reduction, especially through the stock and conditionality channels. It was noted that this will lead to a greater achievement of the MDGs in the future.

Table 5 further shows that at the state level, highest average CWI in 1999 are found in Lagos (0.386), Delta (0.310), Anambra (0.302) and Osun (0.297), while the lowest are in Sokoto (0.058), Jigawa (0.074), Kebbi (0.085) and Zamfara (0.095), all from northern Nigeria. In 2003, Lagos, FCT, Rivers and Kwara states have the highest average CWI of 0.560, 0.488, 0.460 and 0.445, respectively, while the lowest average CWI are in Jigawa, Kebbi, Sokoto, Bayelsa and Ebonyi states with 0.138, 0.140, 0.152, 0.169 and 0.173, respectively. In the 2008, Lagos, FCT, Anambra and Abia have the highest average CWI of 0.534, 0.497, 0.490 and 0.463, respectively, with the lowest being in Yobe (0.158), Jigawa (0.163), Bauchi (0.169), Zamfara (0.178) and Taraba (0.184).

Across the geo-political zones, Table 5 shows that southern zones have higher average CWI than their counterparts from the northern part of the country, where north-central zone records the highest values across the years. More precisely, south-west zone records the highest average CWI of 0.282 in 1999, whereas south-south has the highest average value of 0.388 in 2003. In 2008, south-east zone records the highest average CWI of 0.389. It should be noted that economic development is generally low in many northern states, and this is affecting welfare. Precisely, Lagos seems to be the most industrialized and higher educational development in the southern part of the country is another major driver of human development. It should be further emphasized that due to its geographical location, some northern states suffer from some form of environmental degradation, the cumulative impact of which is bound to affect welfare negatively.

Table 5 further shows that urban sector has higher average CWI in all the years than rural areas with 0.321, 0.438 and 0.466 in 1999, 2003 and 2008, respectively. Ademiluyi and Aluko-Arowolo (2009) submitted that development in Nigeria as one of the British colonies reflects some favoritism towards urban areas. The developmental strategies for growth have not departed significantly from those bequeathed to us by the former colonial masters. Thus, from the colonial period, the pattern of delivery of social amenities like water, electricity, health etc. has always favoured the urban population at the expense of rural dwellers (Pearce 2001). This therefore places urban people at a better platform for human development and poverty alleviation. Also, monetary poverty is synonymous to rural areas with highest concentration among those taking farming as primary occupation (NBS 2009).

In Table 6, Lagos state records the highest average CWI of 0.059 for the poorest quartile while Rivers has the lowest values of 0.027. Similarly, Abia and Lagos states have the highest average CWI of 0.136 and 0.130 respectively for the second quartile in 1999, while Bauchi with 0.107) and Edo with 0.113 have the lowest. In the third quartile, Lagos and Osun states have the highest CWI, but surprisingly, Borno, Yobe and Bauchi states took the lead for the fourth quartile.

Table 6 further shows that between 1999 and 2003, for the first quartile, all the states have improvement in CWI with Rivers having the highest (0.074) and Sokoto having the least (0.025). In the second, third and fourth quartiles, similar results were obtained. Between 2003 and 2008, the table further shows that there is decline in CWI in all the results except Oyo, Sokoto, Abia, and Imo states for the first quartile and Osun Oyo Ebonyi, Ekiti, Sokoto, Edo, Lagos, Abia, Adamawa, Delta, Ogun, Kwara, south west zone and urban areas for the third quartile and Ebonyi, Jigawa, Zamfara, Niger, Nassarawa, Bauchi, Osun, Kana, Ekiti, Benue, Katsina, Akwa Ibom, Sokoto and Imo states for the fourth quartile.

CONCLUSION

Analysis of poverty in Nigeria has often focused on income/expenditure approach. The poverty classifications of the states and zones over the years have often pointed to the pervasiveness of poverty situation in the northern parts of the country. This study, though focusing on the multidimensional nature of poverty is also coming up with similar findings. It can be concluded that multidimensional poverty is pervasive with rural areas being more affected. Also, many states in the northern part of the country are mostly affected. This presupposes that Nigerian poverty assessments will give similar results, whether income or non-income welfare indicators are used.

RECOMMENDATIONS

In order to address poverty problem in Nigeria, rural areas should be given priority through

rehabilitation of the rural infrastructures. There is need to drag the poor households from educational poverty as those in the first and second quartile did not have formal education at the rural, urban and national level. There is the need to improve access to electricity in rural area as well as the urban poor households. There is need to re-visit the issue of sanitation due to the fact that access to improved sanitation has declined at the national and urban level while at the rural level there is lack of access to improved sanitation. Telephone communication has improved over the years but there is need to make it more affordable to the poor because access by the poorest quartiles in urban and rural sectors is very low.

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