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**NON-FOOD POVERTY DIFFERENTIAL ACROSS URBAN/RURAL AND GEO-POLITICAL
ZONES IN NIGERIA**

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Abstract

This study estimates non-food poverty in Nigeria by evaluating non-food poverty incidence, severity and intensity at the urban/rural areas, geo-political zone and national level. It also evaluates the concentration of the non-food poor in principal sectors of employment in the country. Probit regression model, Foster-Greer-Throbecke (FGT), and Location index were used for the analysis. Data for the study was obtained from the Nigeria General Household Survey (GHS) for 2011/12 and 2015/16 periods, with 4246 and 4582 households, respectively. Findings from the study reveal that non-food poverty incidence in the country is high and increasing. Non-food poverty is more in the rural areas than in the urban areas. Also, non-food poverty is highest in the Northern zones compared to the South; more among females than males in the two periods. In addition, the study shows that non-food poverty rate is lowest (28.6%) among population with tertiary education in 2011/12, but increases drastically (60.2%) in 2015/16. Non-food poverty gap and severity increase in the country in 2015/16; with the South recording higher rate than the North. The regression result shows that households headed by female experience more non-food poverty compared to household headed by male. Finally, the study reveals that non-food poor are concentrated in the agricultural, manufacturing and services sectors of the economy. Hence, the study recommends that pro-poor policies targeted at the non-food poor and directed to the sectors where they are concentrated should be designed and conscientiously implemented.

Keywords: FGT, non-food poverty, GHS, severity, poverty gap

JEL Classification: O1, O11, O18

1.0 Introduction

Poverty has been a core issue of discuss in the world, and the foremost target in the Sustainable Development Goals (SDGs). No less than 1.9 billion people in the world were extremely poor (below US\$1.90 per day) in 1990; however, the number declined to about 736 million in 2015 (World Bank, 2018). Despite the decline in extreme poverty in the globe, there still exist variations across regions of the world. Extreme poverty incidence in the Sub-Sahara African (SSA) region records the highest rate. The World Bank report affirmed that 278 million people were extremely poor in the region in 1990; the number increased to 413 million in 2015. This includes about 15 million children who live in absolute poverty. The report further forecasted that 9 out of every 10 persons who are extremely poor are expected to live in SSA by 2030 (World Bank, 2018).

The Nigerian case is more critical and complicated. Nigeria is the largest black nation in the world and the largest economy in the SSA region, as well as a major oil producer in the world. Paradoxically, extreme poverty has persistently increased in the country. Poverty rate increased from 27.7 percent to 69.0 percent between 1980 and 2010 (National Bureau of Statistics, 2012). These figures reflect millions of people, in a rapidly growing population, who live in extreme poverty in the country. Currently, over 90 million Nigerians are extremely poor (absolute poverty) – the highest in the world (Poverty World Clock, 2019).

The persistence of poverty in Nigeria has led to different dimensions of problems. These include increasing rates of crimes and social vices, community and regional violence and agitation, militancy and prostitution, illegal international migration, loss of human capital, and brain drain (Ogbeida *et al.*, 2015), among others. These have threatened peaceful societal coexistence, and have reinforced socioeconomic misfortune which impedes national development (Obisesan *et al.*, 2016).

Different policies and strategies to alleviate poverty in Nigeria seem to yield little or no positive outcome (Ifelunini *et al.*, 2012; Akinbobola *et al.*, 2015). Efforts to tackle poverty in the country have overtime been channelled more on food consumption through increasing food supply and consumption of individuals (the minimum calorie approach), with a neglect of non-food consumption. Despite the efforts, poverty rate continues to increase in the country. This could be because the welfare of an individual does not only depend on food consumption, but also on non-food consumption such as education, health, housing, water, clothing and footwear, household goods, freedom, etc (Basole and Basu, 2015). For instance, lack of shelter, clothing, and freedom is as bad as undernourishment (Haq and Bhatti, 2001).

Studies have shown that non-food consumption can be a good measure and proxy for household welfare as it increases with the level of income (Haq and Bhatti, 2001; Ifelunini et al., 2012; Chaudhry, 2002). Basole and Basu (2015) studied non-food expenditures and consumption inequality in India. Their study revealed that increase in overall expenditure inequality and poverty is as a result of the increased weight in the household budget of non-food spending, which happens to be more unequal compared to food spending. Ahmad et al., (2012) examined the incidence of poverty in seven towns in Lahore using non-food consumption. They found the prevalence of non-food poverty in those town; however, they could not reach a conclusion on the concentration of non-food poverty either in the rural or urban areas, following the discrepancy in their results. Haq and Bhatti (2001) provided a framework for analyzing sectoral structure of non-food poverty in Pakistan. They found that there is high concentration of the non-food poor in the agricultural sector than in any other sector in Pakistan.

Studies on poverty in Nigeria have focused more on food poverty (the minimum calorie approach) (Ozughalu et al., 2013; Ogbeida et al. 2015; Osahonet al., 2011; Olowa, 2010; Akinbobola et al., 2015). Only few studies (Obisesan et al., 2016; Ifelunini et al., 2012; Ogwumike, 1991) attempted to incorporate non-food component in their analysis of poverty in the country. In as much as the food consumption approach is plausible, however, it is not exhaustive, as individuals have other non-food needs that contribute to their welfare. Hence, this study investigates non-food poverty in the country.

Specifically, the study evaluates non-food poverty differential in urban/rural areas, geo-political zones, and the country at large, determining poverty incidence, gap and severity based on non-food consumption. Also, it examines the relationship between selected socioeconomic characteristics of individuals and non-food poverty in Nigeria. The study further evaluates the concentration of the non-food poor in principal sectors of employment in the country which is a major contribution of this paper. This study is divided into the following sections: the introduction, theoretical construct and methodology, results and discussion, and conclusion and recommendation.

2.0 Theoretical Construct

Different theories in development studies have tried to relate how household expenditure influence their consumption and welfare (Haq and Bhatti, 2001; Chaudhry, 2002). This study adopted the Engel's theory, commonly known as Engel's Law, which describes the relationship between household expenditure on food and non-food and income (Pasinetti, 1987). According to the theory, the income share of food (non-food) expenditure falls (rises) as income increases; though absolute expenditure on food may rise. The "Engel coefficient" can serve as welfare indication of the household. An increase (decrease) in the

proportion of food expenditure as income increases indicates that the household has low (high) standard of living (Lewbel, 2007). This is also applicable in determining how poor or rich a household is (Pasinetti, 1987).

3.0 Methodology

3.1 Estimation Techniques and Model Specification

The Extended Linear Expenditure System (ELES) estimation technique was used to determine the non-food consumption poverty line. This technique was developed by Ali (1995) which is an extension of the Linear Expenditure System (LES) developed by Stone (1954). Given the additive utility function in the system and the budget constraint (V), we have their equations represented respectively as:

$$U(X) = \sum f_i(x_i) = \sum a_i \cdot \log(x_i - r_i) \quad (1)$$

$$\sum_i p_i x_i = \sum_i v_i = V \quad (2)$$

where x_i represents the quantity of good i consumed ($i=1, 2, \dots, n$), r_i 's represents basic needs, and P_i is the price of i th good. Maximizing the utility function subject to the constraint gives the demand function:

$$v_i = p_i r_i + b_i (V - \sum_j p_j r_j) \quad (3)$$

The expression in equation (3) is a system of n expenditure equations which are linear in total expenditure and prices. With the given level of total expenditure and prices, $(\sum_j p_j r_j)$ determines the average minimum level of consumption expenditure of the society which defines the Total Poverty Line (TPL) (Ali, 1995). Hence, the TPL in this case can be seen as the average minimum expenditure of non-food items by all individuals in the society (Ali, 1995). Hence, non-food poverty line for this study is defined as average of all non-food expenditure in a particular period. That is, the summation of all expenditure on non-food items by the entire households in a particular period, divided by the number of households. Households whose non-food expenditure is less than this average value are considered non-food poor (Haq and Bhatti, 2001; Olowa, 2010; Akinbobola et al., 2015; Obisesan et al., 2016).

The non-food poverty line for this study is the average of all non-food expenditure in 2010/11 and 2015/16. Non-food poverty line for 2010/11 and 2015/16 are N138, 513.46 and N29, 081.41 naira, respectively. Households whose non-food expenditure is less than this average value are considered non-food poor. The non-food items for this study include shelter, clothing, health, education, safe/clean water, electricity/fuel/lightening, and sanitation.

Probit regression model, Foster-Greer-Throbecke (FGT), and Location were used for the analysis of this study. The Probit model was used to determine the relationship between selected socioeconomic characteristics of individuals and non-food poverty. Probit regression model was chosen because of its precision as well as its ability to handle dependent variable with two binary values (0 and 1). The model is stated as:

$$\text{Pro} (y_i = 1) = X_i \beta + U_i \quad (4)$$

Where y_i = binary dependent variable (non-food poverty) which can take values 0 and 1 (0 is non-food non-poor, 1 is non-food poor); X_i is the vector of selected socioeconomic characteristics which include sex, marital status, education and area of residence; β is the parameter estimate; while U_i is the error term. The non-food items for this study are shelter, clothing, health, education, safe/clean water, electricity/fuel/lightening, and sanitation.

The FGT model was used to determine the intensity and severity of non-food poverty in the country. The FGT indices are poverty metrics which include poverty incidence index; poverty gap index; and the poverty severity index (Forster et al., 1984). The indices depend on a parameter ‘ α ’ (Filmer et al., 1999). The FGT indices measure the incidence, depth, and severity of non-food. The FGT model is stated as:

$$P_\alpha = \frac{1}{n} \sum_{i=1}^q \left[\frac{Z - Y_i}{Z} \right]^\alpha \quad (5)$$

Where Z is the poverty line based on non-food consumption expenditure, q is the number of household below the poverty line, Y is the non-food expenditure of the household, n is the total number of household/population size, P_α is the poverty parameter/index and α is the FGT parameter which takes value 0, 1, and 2. When ‘ α ’ is 0, 1, and 2, we have the headcount index (HCI), poverty gap index (PGI), and squared poverty gap (or severity) index (SPG), respectively.

For sectoral analysis of non-food consumption poverty, Headcount Index is:

$$P_i = \frac{H_i}{N_i} * 100 \quad (6)$$

Where P_i is the percentage of households in sector i below the non-food poverty line; H_i is the total number of households in sector i below the non-food poverty line in household size N_i .

Location Index (L_i) was used to measure the concentration of the non-food poor household in the principal sectors of employment (Haq and Bhatti, 2001). Location index model is stated as:

$$L_i = \left(\frac{P_i}{P_0} \right) * 100 \quad (7)$$

Where, P_i is the percentage of non-food poor households in sector i and P_0 is the overall percentage of non-food poor households in the country. If L_i is greater than, less than or equal to 100 , then there is higher, lesser, or equal concentrations of non-food poor households in sector i respectively, relative to their proportion in the total population.

3.2 Source of Data

Data was sourced from the Nigeria General Household Survey (GHS) data for 2010/11 and 2015/16 periods. The GHS is a cross-sectional survey of 5,000 households all over the 36 states of the country, carried out periodically by the National Bureau of Statistics (NBS) in partnership with other local and international bodies (NBS, 2016). However, a total of 4,226 and 4,582 households were finally used for 2010/11 and 2015/16, respectively for the study, after cleaning and removing observations with a lot of missing data. The survey covers different areas such as socioeconomic characteristics, geographic and sectoral activities of the households, among others.

4.0 Results and Discussion

4.1 Description of the Data

Table 1 shows the description of the data for the study in 2010/11 and 2015/16 by sex, marital status, age, area of residence and geo-political zone. From the table, the proportion of male is more than that of female in the two periods. Also, in the two periods, the sample consists of more married household heads than single and divorced household heads; more independent age group; and more rural dwellers than urban dwellers. The total number of people surveyed in 2010/2011 increased by 7.9 per cent in 2015/2016 which is relatively small; hence, allows for comparison.

Table 1: Description of the Data in 2010/11 and 2015/16

Variables	2010/11		2015/16	
	Frequency	Percentage	Frequency	Percentage
Sex:				
Male	3,657	86.1	3,649	79.6
Female	589	13.9	933	20.4
Marital Status:				
Single	165	3.8	155	3.4
Married	3,958	93.2	4,270	93.2

Divorced	123	2.9	157	3.4
Age:				
Dependent (66+)	528	12.4	919	20.1
Independent (18-65)	3,718	87.6	3,663	79.9
Area of Residence:				
Urban	1,374	32.4	1,468	32.0
Rural	2,872	67.6	3,114	68.0
Geo-political Zone:				
North-Central	766	18.0	792	17.3
North-East	563	13.3	639	13.9
North-West	831	19.7	881	19.2
South-East	717	16.9	753	16.4
South-South	677	15.9	746	16.3
South-West	692	16.2	771	16.8
Total	4246	100	4582	100

Source: Author's computation using data from GHS

4.2 Regression Result

Table 2 shows the regression result of the relationship between selected socioeconomic characteristics and non-food poverty in the country for the two periods. The table shows the marginal effect, standard error, and the significance level of the estimates. All the selected socioeconomic characteristics are significant at 1 per cent level, except divorced (significance at 10%), under marital status variable. The result also reveals that the magnitude of the effect of the relationship is higher in 2010/11 than in 2015/16 period for all the variables, but married.

The results for sex, age and area of residence show positive relationship with non-food poverty in the two periods. Only marital status has a negative relationship with non-food poverty in the periods. Under sex, keeping male as the base, the female variable has coefficients of 0.09 and 0.086 in 2010/11 and 2015/16 respectively. This implies that non-food poverty increases by 9 and 8.7 per cents in households headed by females in the respective periods compared with households headed by male in the country. This could be as a result of the low female labour force participation, employment and income discrimination on the female in the country (Ozughalu and Ogwumike, 2013).

Non-food poverty falls in households headed by married individuals as against households headed by individuals who are single. However, the effect is more in the second period (15.7%) than the first (12.3%). The result surprisingly shows that non-food poverty falls in households headed by individuals who are divorced as against households headed by individuals who are single in the two periods. This result is in contrast with the general perception that households headed by a divorcee are likely to become poorer (Basole and Basu, 2015). For the age variable, non-food poverty increases in households headed

by individuals within the independent age group (18-65) by 8.5 per cent in 2010/11 compared to those headed by individuals within the dependent age group (66+). However, in 2015/16 the magnitude of relationship decreased to 7.2 per cent. The table further reveals that non-food poverty increases in households living in the rural areas by 29.5 per cent in 2010/11 compared to households living in the urban areas, but declines to 17 per cents in 2015/16. This could be attributed to the prevalence of unemployment, unskilled labour, and low income in the rural areas; hence, they spend more on food than non-food consumption (Osowole, 2013).

Table 2: Regression result for non-food poverty in Nigeria 2010 and 2015

Non-food Poor	2010/11		2015/16	
	Marginal Effect (dy/dx)	Standard Error	Marginal Effect (dy/dx)	Standard Error
Sex: Female	0.096***	0.018	0.086***	0.014
Marital status: Married	-0.123***	0.031	-0.157***	0.024
Divorced	-0.084*	0.051	-0.072*	0.037
Age: Independent (18-65)	0.085***	0.019	0.075***	0.014
Area of residence: Rural	0.295***	0.016	0.170***	0.014
F-statistics	(5, 3945) 88.10		(5, 4576) 47.12	
Probability > F-statistics	0.000		0.000	

Note: *** and * significance at 1% and 10% levels respectively

Source: Author's computations

4.3 Non-food Poverty Profile

4.3.1 Geographic Characteristics

Figure 1 shows the non-food poverty profile according to geographical location in the country. The result reveals that non-food poverty profile is not only high but has also increased in the two periods of study. Non-food poverty incidence for the country increased from 71.2 per cent to 74.5 per cent in 2015/16. This can be seen as a reflection of economic condition of the country. Nigerian economy witnessed persistent contraction and finally plunges into recession in 2016. Real GDP growth rate declined sharply from 7.8 per cent in 2010 to 2.6 and -1.6 per cents in 2015 and 2016, respectively. Exchange rate, inflation, unemployment and inequality (Gini Index) remain relatively high in the country during the period (Ogwumike and Ozughalu, 2018). In terms of area of residence, the result shows that non-food poverty is high in the rural areas compared to that of the urban areas. This is in line with the Engel's law of

consumption that the poorer households spend more on food consumption than non-food consumption (Ogbeide and Agu, 2015).

Non-food poverty profile is higher in the northern regions of the country than in the southern regions in the two periods. However, non-food poverty incidence increases in the three southern regions in 2015/16 while it decreases in the northern regions, excluding North-Central. The decrease in non-food poverty incidence in the north may not necessarily mean improvement in welfare of the people. But this may be attributed to mass migration of the people from the North to the South as a result of persistent insurgent attacks in the northern region (Obisesan et al., 2016). Also, many have been displaced of their homes and communities, seeking refuge in internally displaced persons (IDPs) camps outside the region. Hence, the number of non-food poor declined in the region. This may account for the increase in non-food poverty in the southern region of the country in 2015/16. However, the harsh economic condition of the country and in the region could also have contributed to the non-food poverty deterioration in the region (Obisesan et al., 2016).

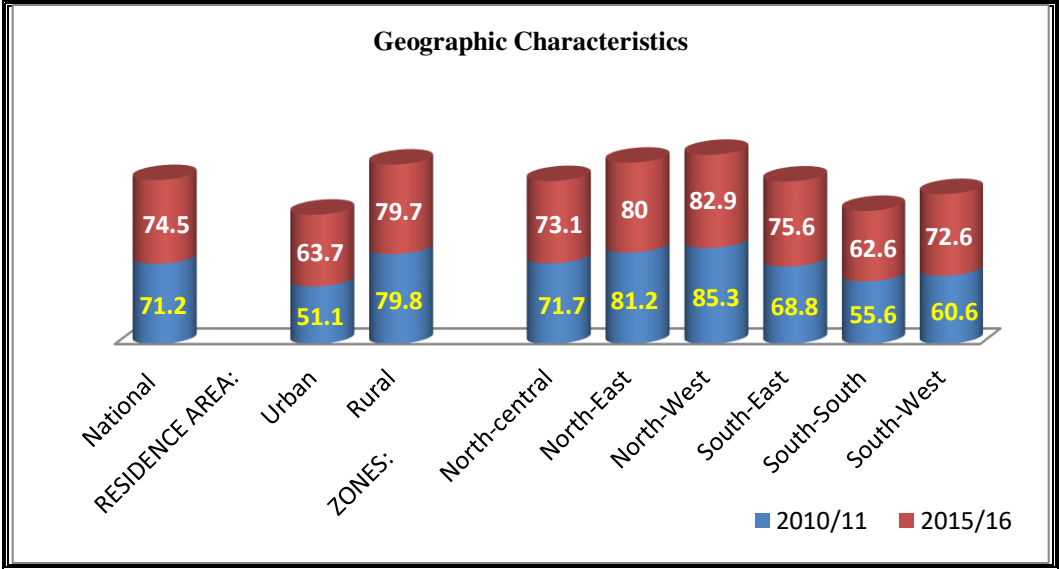


Figure 1: Non-food Poverty Profile in Nigeria 2010 and 2015

Source: Author’s computations

4.3.2 Socioeconomic Characteristics

Non-food poverty incidence increases in all selected socioeconomic characteristics of individuals in the country in 2015/16 (see, Figure 2). Non-food poverty is higher among the female population than the

male population. Also, it is surprisingly higher among the independent than the dependent age group in the country. High unemployment, low income level; especially at the early stage of one’s career, as well as the need to care for the dependent population could account for the larger proportion of the non-food poor among the independent age group (Daneji, 2011). The result further shows that non-food poverty incidence records as low as 28.6 per cent among population with tertiary education in 2010/11. However, it increases rapidly in 2015/15 with over 100 per cent difference. This dismal outcome is clear indication of the declining condition of the Nigerian economy in the period. The economy witnessed retarded growth, high level of unemployment among university graduates, non-payment of salaries to government workers and reduction in the amount of salary paid by many state governments in the country (Akinbobola and Saibu, 2004). The result also reveals that non-food poverty is higher among individuals who are singles than married and divorced individuals in the country. Increasing rate of youth unemployment and the mismatch of skills and available job could account for this outcome.

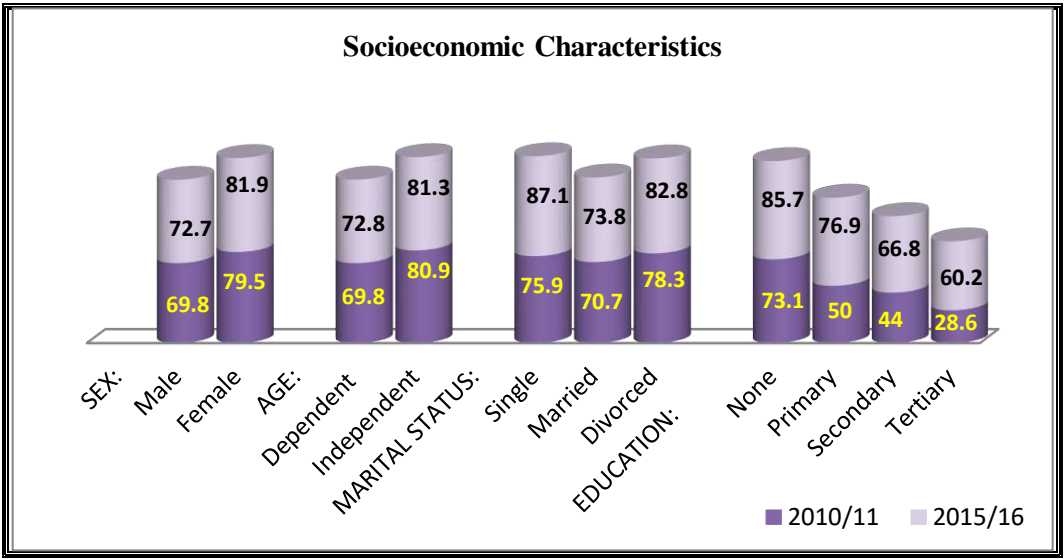


Figure 2: Non-food Poverty Profile in Nigeria 2010 and 2015

Source: Author’s computations

4.3.3 Non-food Poverty in Principal Sector of Employment by HCI

Non-food poverty incidence in the principal sectors of employment by head-count index (HCI) is shown in Figures 3. The estimates of the head-count index show an increasing trend of non-food poverty incidence in all sectors of the economy in 2015/16 period except in the agricultural and service sectors. However, the agricultural (85.6%) and service (61.4%) sectors record the highest proportion of non-food poor in 2010/11, before the declines in 2015/16. The professional sector has the least proportion of non-

food poor by head-count index in the two periods in the economy; however, it records an increase rate of 10.5 per cent in 2015/16 which is the highest rate of increment among all the listed sectors (see Figure 3).

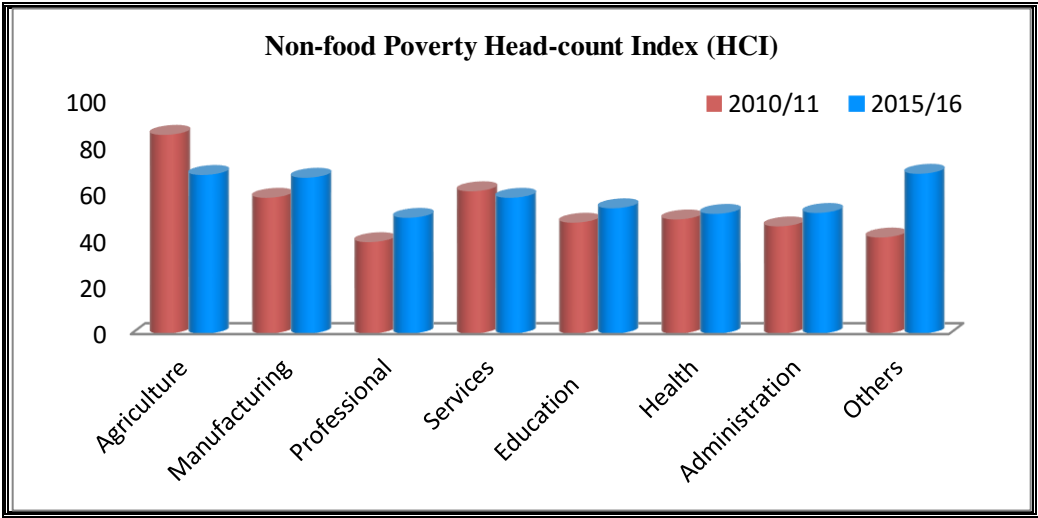


Figure 3: Non-food Poverty in Principal Sector of Employment in Nigeria by HCI
Source: Author’s computations

4.3.4 Non-food Poverty in Principal Sector of Employment by LI

Figure 4 shows the location index (LI) of non-food poverty in principal sector of employment. LI shows the proportion of the non-food poor in each sector relative to the proportion of non-food poor in the country. Location index value above 100 shows more concentration of the poor relative to population share. The result reveals that the agricultural sector ranks highest in the two periods with values above 100. Also, the manufacturing and the services sectors record location index values above 100 in 2015/16. This indicates that there is an increasing influx of the non-food poor in the two sectors which should be a concern to policy makers. It is commonly believed that that the poor is concentrated in the agricultural sector alone; hence, different policies have always been designed to target the sector (Basole and Basu, 2015). But the result shows that lately, the poor are more in the manufacturing and services sectors of the economy as well.

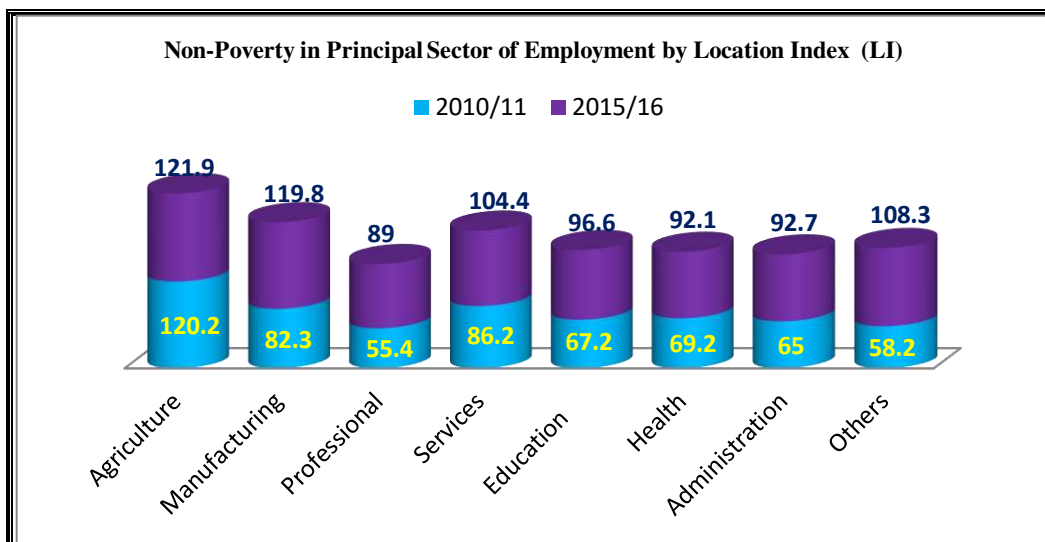


Figure 4: Non-food Poverty in Principal Sector of Employment in Nigeria by LI
 Source: Author's computations

4.4 FGT Result of Non-food Poverty in Nigeria

Table 3 presents non-food poverty profile of the country based on head-count index (HCI), poverty gap index (PGI) and squared poverty gap (SPG) (poverty severity) in 2010/11 and 2015/16. Although head-count poverty is high and increasing in all the variables (excluding in North-West), poverty gap and severity rate are considerably moderate in the two periods. Poverty gap and poverty severity in the country based on non-food increased only by 2 per cent each to 44 per cent and 32 per cent in 2015/16 respectively. This shows that the intensity of non-food poverty is moderate in the country, though the incidence remains high. The result suggests that the intensity and severity of non-food poverty in the country are not chronic; however, there should be caution to checkmate further increases. Poverty gap and severity at the rural and urban areas level are below that of the nation, but both increase in 2015/16. Poverty gap and severity range from 35 to 43 per cent and 25 to 31 per cent respectively, among the geopolitical zone in 2010/11. Similarly, in 2015/16, poverty gap and poverty severity respectively record high of 45 per cent and 34 per cent, and low of 36 per cent and 27 per cent at the zonal level. South West records the highest increase in poverty gap index while North Central records the lowest. Similarly, South Eastern region records the highest poverty severity, while North Central and North East record the lowest poverty severity in the country in 2015/16.

Table 4: Non-Food Poverty Profile by Head count (HCI), Poverty Gap (PGI), and Severity (SPG)

	HCI ($a=0$)		PGI ($a=1$)		SPG ($a=2$)	
	2010/11	2015/16	2010/11	2015/16	2010/11	2015/16
National	0.71	0.75 ↑	0.42	0.44 ↑	0.30	0.32 ↑
Area of Residence:						
Urban	0.51	0.63 ↑	0.34	0.42 ↑	0.24	0.30 ↑
Rural	0.80	0.80	0.39	0.43 ↑	0.29	0.31 ↑
Geo-political Zone:						
North central	0.71	0.73 ↑	0.41	0.36 ↓	0.29	0.27 ↓
North East	0.80	0.80	0.43	0.37 ↓	0.31	0.27 ↓
North West	0.85	0.82 ↓	0.38	0.41 ↑	0.30	0.32 ↑
South East	0.68	0.75 ↑	0.38	0.41 ↑	0.27	0.34 ↑
South-South	0.55	0.62 ↑	0.35	0.44 ↑	0.25	0.33 ↑
South West	0.60	0.73 ↑	0.37	0.45 ↑	0.25	0.32 ↑

Source: Author's computations

5.0 Conclusion and Recommendations

Non-food poverty is a real phenomenon in Nigeria that demands more and urgent attention. The study estimates non-food poverty in the country and identifies that non-food poverty is enormous in the country both at the regional and zonal levels. The rural dwellers experience more of non-food poverty as a result of the low level of economic activity as well as low income. Also, females are more vulnerable to non-food poverty in the country and have high probability of being non-food poor than the male population. The study further identifies the non-food poor are concentrated in the agricultural, manufacturing and services sectors of the economy.

The identification of the sectors that have the bulk of the poor will help in designing policies that will be specifically targeted to those sectors. Government, therefore, should concentrate on sector-specific policies rather than “one-size-fits-all” policies targeted at poverty reduction in the country. Fight against poverty in the country can be improved by government paying more attention to non-food consumption items of the household. Also, there should be conscious commitment in improving on the infrastructures (housing, electricity, education, health, etc) in the country to make them both accessible and affordable for low income households; hence, improving their welfare.

In addition, employment schemes, capacity building and human capital development should be initiated, targeted at the poor, to empower and improve their living standards, especially in the rural areas. Moreover, income increase and redistribution can also be good policy to lift many people out of poverty if adequately implemented.

Finally, poverty alleviation programs should not be seen as an act of charity but a necessity for the country to lift its citizen out of poverty; hence, requires conscious commitment for proper implementation.

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