
POVERTY AND INEQUALITY IN NIGERIA: A HOUSEHOLD-LEVEL FOUR-WAVE COMPARATIVE STUDY

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ABSTRACT

Poverty and income inequality have been a recurring challenge in the global space for more than five decades. While these challenges have been declining globally, they have remained unabated and rising in Nigeria; thus, making Nigeria tagged as their destination. Thus, the research set out to evaluate the poverty and inequality in Nigeria using a household four-wave of secondary panel data of 4,000 nationally representative households of the Nigeria General Household Survey GHS - Panel collected by the National Bureau of Statistics from 2010 to 2019. Analytical tools used were descriptive statistics, the Foster-Greer-Thorbecke (FGT) poverty index, Lorenz's curve, and the Gini coefficient. The results of the Foster-Greer-Thorbecke poverty headcount showed that over 50% of all the respondents remained under the poverty line throughout the four waves, thus indicating the prevalence of chronic poverty rather than transient poverty during the period. The general poverty depth ranged from 0.21 to 0.23 and the poverty severity ranged from 0.11 to 0.12. The Gini coefficient of inequality for total expenditure ranged from 0.39 to 0.44 with higher sectoral inequality. The results showed that Nigeria had chronic poverty, moderate poverty depth, and severity; and moderate inequality. Therefore, with strong political will and consistently right policies, Nigeria can exit extreme poverty. This work unraveled the reason behind the persistently high poverty status and inequality of Nigeria and has revealed the path not taken, which if done would enable Nigeria to exit extreme poverty and hunger.

Keywords: Expenditure, households, inequality, poverty, Nigeria.

1. INTRODUCTION

There are two global human development challenges, and these are poverty and income inequality. It is these challenges that this research seeks to study as they relate to Nigeria. The data for this research is panel data of 4,000 households covering ten years, from 2010 to 2019 obtained from the National Bureau of Statistics of Nigeria datasets hosted by the World Bank. Poverty has seemingly been an intractable global challenge. It occupied the first position of concern in the Millennium Development Goals, MDG, and is equally the first Goal of concern in the Sustainable Development Goals, SDG. SDG 1 aims to "End poverty in all its forms everywhere." This is an ambitious goal. Its first target is "By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than \$1.25 a day." United Nations (2024a). The United Nations (2024b) in its progress report on ending poverty, stated that the world made remarkable progress in reducing poverty between 1990 and 2014 when over 1 billion persons were lifted out of poverty. The global poverty rate which was 37.8% in 1990 had reduced to 11.2% by 2014. This surpassed the MDG 1 of halving the number of those living in extreme poverty by 2015. Although the pace of poverty reduction slowed down between 2015

and 2019, yet it sustained the reduction trend and ended at 8.2% in 2019 (UNSTAT, 2021). While the steady decline in poverty rates gave room for optimism that the eradication of extreme poverty was in sight, it turned out that the vast reduction in poverty came mainly from East Asia and the Pacific, as well as South Asia. China, in particular, contributed hugely to this effort by eradicating extreme poverty in the country. (UNISTAT, 2021; Bertrand, 2022).

However, the same could not be said for Sub-Saharan Africa (SSA), where extreme poverty continued to fester and rise. Recent studies showed that poverty, especially Africa's poverty, shows no sign of declining through 2030. In the years to come, poverty is projected to be limited to Sub-Saharan Africa, Southeast Asia, and conflict and fragile states. Indeed, the destination for poverty has been narrowed to Nigeria, which in 2018 became the poverty capital of the world before being overtaken again by India. (Schoch and Lakner, 2020a). Schoch and Lakner (2020b) observed that "One reason behind the slowdown in global extreme poverty reduction is the slow progress in Sub-Saharan Africa." They opined that going by the current trend, "extreme poverty will likely become a predominantly Sub-Saharan Africa phenomenon in the coming decade". Schoch and Lankner (2020a) observed that "Almost half of poor people in Sub-Saharan Africa live in just five economies which are Nigeria (79 million), the Democratic Republic of Congo (60 million), Tanzania (28 million), Ethiopia (26 million) and Madagascar (20 million)."

The World Bank (2024b) observed that SSA "faces the triple challenges of high extreme poverty, high inequality, and the weakest transmission of growth to poverty reduction." Schoch and Lankner (2020b) noted that Nigeria accounts for around 20% of the total population of Africa while one in two West Africans is a Nigerian. Combating poverty in Nigeria is therefore a desirable end as it would affect 20% of Africans and 50% of West Africans. The National Bureau of Statistics, NBS (2022) poverty report on Nigeria shows that in 2019, 40.1% of Nigerians were poor using the monetary poverty measure but in 2022, 63% of Nigerians were poor multi-dimensionally. This shows that with over 60% of its population in multidimensional poverty, Nigeria must pay attention to its poverty status.

The second challenge is that of Income Inequality. In its publication on global income inequality, Ames et al. (2018) stated that "The richest 10 percent today snap up 52 percent of all income. The poorest half just get 8.5 percent." This means that more than half of the world's income resides with just 10% of the world's population, while 50% of the world's population, over 4 billion people, have only 8.5% of the world's income among themselves. This reflects a situation of acute inequality. IMF also highlighted income inequality among nations, as well as intra-country income inequality. In Nigeria, the disparity between the rich and the poor was wide. World Bank (2017) indicated that in 2010 the highest 20% in Nigeria had a 54.01% share of the national income while the lowest 20% had just 4.41%. The lowest 60% had 25.66% of the national income while the highest 40% had 74.34% of the national income. The Gini Index for 2010 was 48.83. There was an improvement in the 2016 figures as the lowest 20% had 5.39% of national income while the top 20% had a reduced share of 48.93%. There was a fairer equitable spread because the lowest 60% had 41.45% of the income while the upper 40% had 58.55% of the income. These two challenges did not operate in silos or on a standalone basis but they interacted with one another thus deepening the severity of the challenges on the people.

Given the labelling of Nigeria as one of the poverty destinations; and its low ranking in global inequality, this paper set out to examine the dynamics that took place in these two challenges in the ten years of 2010 to 2019 to unravel the nature of the challenges and what can be done to halt the downward spiral so that Nigeria will no longer hold back the world in global human

development. The rest of the paper features section 2 which discusses the methodology; section 3 the results and discussion; and section 4 gives the conclusion and recommendations.

2. METHODOLOGY

2.1 Study Area

The study was conducted in the Federal Republic of Nigeria, the most populous country on the African continent with a population of 218, 541,212 in 2022 (World Bank, 2024). Having a large population could translate to a large market which could accelerate economic growth. On the other hand, a large population could potentially predispose to poverty and income inequality. Nigeria lies between Latitude 4°N and 14°N and Longitude 3°E and 15°E. It has a total land mass of 923,768 km². Nigeria is a federation with thirty-six states and a Federal Capital Territory. The World Bank (2022) estimated Nigeria's poverty headcount ratio in 2018 at \$2.15 a day (2017 PPP) at 30.9% of the population. The 2022 population figure was 218.5 million with an annual growth rate of 2.4% and a Human Development Index of 0.4, less than half, in 2020. (World Bank, 2024). The study area had a Gross Domestic Product of \$472.62 billion by 2022 estimates which translated to a GDP per capita of \$2,162.6 or \$5.92 per capita per day. This means that if Nigeria's wealth were to be distributed equitably, there should be no poverty in Nigeria.

The GDP growth rate in 2022 was 3.3% which was higher than the population growth rate of 2.4%, again showing that Nigeria should not be poor even with population growth. The Inflation (consumer price index) stood at 18.8% in the same year 2022 and far outstripped the GDP growth rate at 3.3%. Nigeria's FDI net inflow for 2022 was -0.0%, that is the country had no foreign direct investment. This is a leading indicator for slow growth as Nigeria had to generate all the resources it needed for growth. This was made worse by the insurgency in the country which curtailed farming and other productive activities in the country. Nigeria runs a welfarist economy but has recently removed subsidies from the sale of petroleum products and electricity. It also harmonized its official foreign exchange rate with the parallel market. All these made consumer prices skyrocket and further pushed many people into poverty. These form the baselines for this study.

2.2 Data Source, Sampling Technique, and Sample Size

The datasets were sourced from the Nigeria Bureau of Statistics curated by the World Bank. The NBS adopted the multi-staged stratified simple design for its survey and this has been considered adequate for this study. The survey had all households in the country excluding correctional facilities, military barracks, and student hostels as the survey universe. The geographic unit was each of the six geopolitical zones in the country and the Federal Capital Territory, FCT. From each of the States of the federation and the FCT, the NBS delineated 60 Primary Sampling Areas PSUs, or Enumeration Areas, EA giving a total of 2,220 EAs nationally. 10 households were chosen from each EA to give 22,000 households surveyed but 5,000 households were chosen from 500 EAs across the country selected to form a panel. Of the 5,000 selected in the panel, 4,916 returned their questionnaires, a success rate of 98.32%, which eventually formed the panel. Since it is panel data, there was the mobility of some households between subsequent waves of the survey. By Wave 3, the number of households had dropped to 4,581. This paper used 4,000 households that had complete data across the waves.

Data collection was done in two visits to each household. The first was during the post-planting period between August and October while the second was during the post-harvest period

between February and April of the ensuing year. This is why each wave strides across two consecutive years.

2.3 Foster-Greer-Thorbecke (FGT) Poverty Index

FGT was used to compute and analyse the nature of poverty dynamics in the sampled households. The Foster-Greer-Thorbecke (FGT) poverty index is a widely used measure of poverty that takes into account the depth, severity, and incidence of poverty. The study will employ a relative measure approach by determining the poverty line (two-thirds of the mean per capita total expenditure) as a yardstick i.e., the poverty line was drawn based on the total expenditure of the households. From the survey data, a household is considered to be poor if the household’s per capita expenditure is lower than the poverty line. On the other hand, a household is considered to be non-poor if per capita household expenditure is higher than the poverty line for each wave.

Step 1: Construction of the Poverty Line.

The poverty line is defined as the minimum or the cut-off standard of per capita total expenditure or per capita total income below which an individual or household is described as poor (Townsend, 2018; Olutumise and Ajibefun, 2019). Many earlier studies have used poverty lines which are proportions of the average per capita expenditure. Therefore, in this study, per capita expenditure will be considered. This is viewed as more appropriate in past studies because it is consistent and does not change over some time when compared to income adopted following Igbalajobi et al. (2013). Therefore, the poverty line was defined as two-thirds (2/3) of the mean value of per capita total expenditure of the household in the study area. The households were categorized into poor and non-poor groups using the two-third mean per capita total expenditure (Oluwatayo, 2009; Igbalajobi et al., 2013; Olutumise and Ajibefun, 2019) as the benchmark. Households whose mean per capita total expenditure falls below the poverty line are regarded as being poor while those whose expenditure above the benchmark is considered as non-poor.

$$\text{Per-capita Total Expenditure (PCTE)} = \frac{\text{Total Household Expenditure}}{\text{Household Size}}$$

$$\text{Mean Per-capita Total Expenditure (MPCTE)} = \sum_{i=1}^n \frac{\text{PCTE}}{\text{Total Number of Households}}$$

$$\text{Poverty Line (PL)} = 2/3 * \text{MPCTE}$$

Step 2: Computation of FGT Poverty Index.

Again, the Foster-Greer-Thorbeecke (FGT) poverty index was used to determine the incidence, depth, and severity of poverty among the respondents. The FGT indices are a family of poverty metrics. It puts higher weight on the poverty of the poorest individuals, making it a combined measure of poverty and income inequality. In line with recent work on poverty, the analysis in this study used the per capita total household expenditure as a measure of poverty incidence and for determining the poverty line.

$$P_{\alpha}(y, z) = \frac{1}{n} \sum_{i=1}^q \left(\frac{z - y_i}{z} \right)^{\alpha} \dots\dots\dots (1)$$

- Where: n = total number of households in the population
- q = the number of poor households
- Z = the poverty line
- y_i = household expenditure
- α = poverty aversion parameter and takes on values 0, 1, 2

$\left(\frac{Z - y_i}{Z}\right)$ = proportion shortfall in expenditure below the poverty line.

Determining the poverty index

When $\alpha = 0$ in FGT, the expression becomes:

$$P_0 = \left(\frac{1}{n}\right)q = \left(\frac{q}{n}\right) \dots\dots\dots (2)$$

This is called the incidence of poverty or headcount index, which measures the proportion of the population that is poor i.e., falls below the poverty line.

When $\alpha = 1$ in FGT, the expression becomes:

$$P_1 = \frac{1}{n} \sum_{i-1}^q \left(\frac{Z-y_i}{Z}\right) \dots\dots\dots (3)$$

This is called Poverty depth or Poverty gap index, which measures the extent to which individuals fall below the poverty line as a proportion of the poverty line (or this denotes the proportion of the poverty gap that the average poor will require to get to the poverty line).

When $\alpha = 2$ in FGT, the expression becomes:

$$P_2 = \frac{1}{n} \sum_{i-1}^q \left(\frac{Z-y_i}{Z}\right)^2 \dots\dots\dots (4)$$

This metric, known as the Poverty Severity Index, measures the squares of the poverty gaps relative to the poverty line, assigning more weight to the poorest households. The FGT index ($P_\alpha / \alpha = 0,1, 2$) ranges between zero and one, with values closer to one indicating higher poverty levels. This index has been extensively used to assess poverty levels (Foster et al., 2010; Aigbokhan, 2000; Igbalajobi et al., 2013; Olutumise and Ajibefun, 2019; Oyebamiji and Khan, 2023). Generally, a higher P_0 value indicates a worse poverty situation, a higher P_1 value signifies a greater depth of poverty, and a higher P_2 value denotes more severe poverty conditions.

2.4 Gini Coefficient Measure of Inequality

Gini coefficient, the most widely used single measure of inequality was employed to measure the degree of inequality in the distribution of expenditure in the study area. It is based on the Lorenz curve, a cumulative frequency curve that compares the distribution of a specific variable (e.g., expenditure) with the uniform distribution that represents equality (Poverty Manual, 2005). The value of the Gini coefficient ranges between zero and unity. As the value approaches unity, it implies a greater degree of inequality. A value greater than 0.35 would indicate inequitable distribution (Bobola et al., 2019). The computation of the Gini coefficient is:

$$G = 1 - \sum_{i=0}^{n-1} (X_{i+1} - X_i)(Y_{i+1} - Y_i) \dots\dots\dots (5)$$

Which reduces to:

$$G = 1 - \sum XY \dots\dots\dots (6)$$

Where: G = Gini coefficient

X = percentage of households

Y = cumulative percentage of expenditure from the households

3. RESULTS AND DISCUSSION**3.1 Estimation of Extent of Poverty Status of Households**

The result of the analysis done with the Foster-Greer-Thorbecke (FGT) is tabulated in Table 1. The results cover the measurements of the four wave survey periods: 2010, 2012, 2015, and 2018. The analyses done using the FGT measures were for Poverty Headcount Ratio or Headcount Index (P0), which "measures the proportion of the population that is poor. It is popular because it is easy to understand and measure. But it does not indicate how poor the poor are. "The poverty gap index (P1) measures the extent to which individuals fall below the poverty line (the poverty gaps) as a proportion of the poverty line. The sum of these poverty gaps gives the minimum cost of eliminating poverty if transfers were perfectly targeted. The measure does not reflect changes in inequality among the poor. "The squared poverty gap ("poverty severity") index (P2) averages the squares of the poverty gaps relative to the poverty line." ILO (2005). This measures how poor are the poor because the poor are not equally poor. From Table 1, it can be seen concerning the Per Capita Total Expenditure that a little over half of the sampled households were poor (51.7%) in Wave I, 2010. The number of the poor kept increasing till it reached its peak in Wave III, 2015 when it reached 63.4% and then reduced to 58.5%. This pattern is repeated for sectoral per capita spending on education, health, non-food, and food. The reason for the high figures in 2015 was that that year was an election year when the first five months were focused on electioneering rather than on governance. That year witnessed a shift in power from the ruling party to the opposition. The new administration was slow in taking off as it took six months for it to form a cabinet (government) in November 2015.

In the six months of lull, all macroeconomic indices that were making accelerated progress got reversed and this made the economy to go into a spin, the resultant effect of which was felt in 2016, (being the second part of Wave III), when the economy went into a recession. There were severe restrictions on government spending, contraction of the economy, and distortions to monetary and fiscal policies. The period also witnessed the resort to large-scale foreign loans and domestic loans cum ways and means. The national economy subsequently went into recession twice between 2015 and 2019. The increase in poverty rates from Wave I to Wave III can therefore be linked to this as well as other economic factors that usually heighten poverty levels, such as inflation, retrenchment, or depreciation in real wages. McCorkell and Hinkley (2018) found that during the Great Recession, "Poverty increased from 12.5% in 2007 to 15.1% in 2010." This showed that recession does increase the poverty level in a country. The decrease in poverty witnessed in the succeeding Wave IV in 2018, could be traced to the National Social Investment Programme which was launched in 2016 to combat poverty and food insecurity. The programme had four pillars which included the N-Power for skill development, Conditional Cash Transfer, Government Enterprises and Empowerment Programme; and the Home-Grown School Feeding Program, which provided a meal a day for students (NSIP, 2017).

McCorkell and Hinkley (2018) found that safety nets did mitigate the worst effects of the recession on poverty but they did not go around and some people still got stuck in the recession-era poverty level. This means that poverty needs both short-term and long-term policies to tackle it effectively. Ravallion (2022) observed that economic growth has a limited effect in reducing poverty but the recession had an impact on poverty across demographic strata. This means that efforts to end poverty should include long-term policies and investments because short-term palliatives have limited effects. The sectoral poverty headcount was highly pronounced and reflected respondents' preferences or susceptibility to sectoral challenges. The Per Capita

Education Expenditure showed a high level of persons affected by poverty, worse than the 70:30 ratio. The first wave showed that 71.1% were below the education expenditure poverty line. There was a cosmetic reduction by Wave II to 70.8% but then it had a steep climb to 88.9% in Wave III before reducing to its lowest form at 69% in Wave IV. This reduction could be as a result of the Homegrown School Feeding Programme which provided a meal per school day to students. This reduced the money outlay that parents would have needed to make on the education of their wards.

The result on health, although not as high as that of education, was still high being well over 50%. In Wave I 62.4% witnessed health-related poverty. This reduced in Wave II to 58.8% but then it rose to 61.6% in Wave III before ending at 56.1% in Wave IV. This reduction could be a result of the increase in minimum wage in 2019 from ₦18,000 to ₦30,000. The outcome for Non-Food is very high being consistently over the $\frac{2}{3}$ (67%) mark. Wave I was 71.1% but reduced slightly to 69.3% in Wave II before it hiked to 73.8% in Wave III then finished a little over the $\frac{3}{4}$ mark at 75.4%. This level of non-food specific is very concerning because of the high numbers it generated. This implies that there are fundamental factors affecting the broader macroeconomic environment that the government recognizes or addresses. It also signposts the need to go beyond half measures to long-term investments for combating poverty as China did when it defeated poverty. Per capita food expenditure was also high. Wave I was 69.6% and increased to 73.5% in Wave II but unlike the others before it, Wave III showed a reduction to 59.4% before ending at a high of 74.1% in Wave IV. Not only is the high rate of food poverty worrisome but it also portends a high level of food insecurity as well.

Transport costs have a way of increasing food prices, and hence expenditure on food. Indeed, the inflation rate in Nigeria explains these movements. The inflation rate was in double digits between 2010 and 2012 thus raising the expenditure on food. In 2010 it was 13.74%; 2011 was 10.83%; and 2012 was 12.2%. This explains the increase in the percentage of food poverty between Wave I in 2010 and Wave II in 2012. From 2013 to 2015, the index fell back to single digits such that it was 8.50% in 2013; 8.05% in 2014, and 9.01% in 2015. This explains why the number of food poor in Wave III dropped to 59.4%. From 2016 to 2019, the inflation rate bounced back to double digits. Macrotrends (2023), extracted from the World Bank, reported that inflation was 15.70% in 2016; 16.60% in 2017; 12.10% in 2018; and 11.40% in 2019. It would be seen that the movements in food poverty mirrored the changes in the consumer price index.

Table 1: The Results of the Extent of Poverty Status of the Households

Poverty Status	Wave I		Wave II		Wave III		Wave IV	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Per Capita Total Expenditure								
Poor	2068	51.7	2296	57.4	2536	63.4	2340	58.5
Non-poor	1932	48.3	1704	42.6	1464	36.6	1660	41.5
Per Capita Education Expenditure								
Poor	2844	71.1	2832	70.8	3556	88.9	2760	69.0
Non-poor	1156	28.9	1168	29.2	444	11.1	1240	31.0
Per Capita Health Expenditure								
Poor	2496	62.4	2352	58.8	2464	61.6	2244	56.1
Non-poor	1504	37.6	1648	41.2	1536	38.4	1756	43.9
Per Capita Non-Food Expenditure								
Poor	2844	71.1	2772	69.3	2952	73.8	3016	75.4
Non-poor	1156	28.9	1228	30.7	1048	26.2	984	24.6
Per Capita Food Expenditure								
Poor	2784	69.6	2940	73.5	2376	59.4	2964	74.1
Non-poor	1216	30.4	1060	26.5	1624	40.6	1036	25.9

Source: Author's Computation, 2023

3.2 Dynamics and Magnitude of Poverty

The FGT measures poverty with three indices, the Poverty Headcount (P0) which is those who fall below the poverty line; the Poverty Gap (P1) which measures how deep people are in poverty; and the Squared Poverty Gap (P2) which measures how severe the magnitude of poverty on the people. Table 2 shows the tabulated results from these three measures. The per capita total expenditure is the first presentation. The poverty headcount varied for the four waves as had been discussed. Its lowest value was in Wave I, at 0.517 or 51.7% while its highest value was in Wave III at 0.634 or 63.4%. The poverty depth followed a similar pattern. It had a depth of 0.205 or 20.5% in the first wave, rose moderately to 0.221 or 22.1% in Wave II, and reached its deepest point of 0.265 or 26.5% in Wave III before improving in Wave IV to 0.227 or 22.7%. The poverty severity measure, P2, started at 0.106 or 10.6% which showed moderately high severity, but then it worsened to 0.112 or 11.2% and got to the lowest depth of 0.142 or 14.2%. The poverty line increased in all four waves suggesting inflation as well as growth in available resources. The poverty line, which was computed at $\frac{2}{3}$ of the mean of expenditure, after Smith started at 55873.28 in Wave I, increased to 79918.47 in Wave II, then 110847.80 then it decreased to 100913.10. This is suggestive of higher resources in the economy. In 2010 the minimum wage was increased from ₦7,500 to ₦18,000; the economy was rebased in 2014 and the minimum wage increased again from ₦18,000 to ₦30,000 in 2019

The per capita education expenditure showed high figures in all the indices. For P0, P1 and P2, Wave III was the inflexion point. The P0 figures were over 70% on average, with a peak of 88.9% in Wave III and the least being 69.0%. The poverty gap was high throughout. The least dispersal from the poverty line was 51.8% in Wave IV 2018. The worst result was in Wave III when the dispersion from the poverty line was 0.816 or 81.6%. The poverty severity was highly severe. In Wave I, it was 0.475 reduced slightly to 0.455 then increased sharply to 0.779, that is 77.9%, which is very high severity. This shows that poverty not only increased in number but

also in its depth and severity. These figures validate the global outlook for poverty which shows that poverty is increasing in sub-Saharan Africa. In all the indices, P0, P1, and P2, Wave I showed the best result while Wave III showed the worst result. As discussed earlier, this was because Wave III was an election year. The high educational poverty rate is worrisome but it has been noted that Nigeria is the world capital for out-of-school children. In 2010, 7.5 million children were out of school but by 2020, a year after the end date of this study, the number had grown to 9.6 million and by 2022, it had reached 20 million. Guardian (2022). UNICEF (2023) stated that "One in every five of the world's out-of-school children is in Nigeria." Guardian (2022) quoting a UNESCO report stated that the out-of-school population was concentrated in the north with Bauchi (1,239,759), Zamfara (883,952), Kebbi (877,677), Katsina (873,633), Kano (837,479), Jigawa (784,391), Kaduna (652,990), Gombe (567,852), Adamawa (489,855) and Niger (478,412) as the top ten most affected states.

Insecurity, kidnapping, and school closures were identified as factors fuelling out-of-school and school disruption experiences. Guardian (2022) reported that on April 14, 2014, 276 schoolgirls were kidnapped in Chibok, Borno State; on other different dates, 110 pupils were kidnapped from Dapchi, Yobe State; 444 pupils from Kankara, Katsina State; 276 pupils from Jangebe, Zamfara State; 140 students from Chikun in Kaduna State and 102 pupils from Yauri, Kebbi State. The frequency and the magnitude of the kidnap are alarming and this led to the closure of many schools thus compounding the already bad situation. UNICEF (2023) had it that 11,536 schools were closed for different periods resulting in the disruption of schooling for 5,330,631 students. Given these circumstances, it is understandable that the education spend of households in such areas would be very low and below the educational poverty line when compared with the educational spend of households in relatively safer places and where education is highly valued. The problem of out-of-school children is both cultural and structural, and any policy to solve it must take these realities into account.

Expenditure on health portrayed a high level of underspending for health. At Wave I, 62.4% of respondents spent below the poverty line on health. This oscillated to 58.8 in Wave II, then 61.6% in Wave III, and 56.1% in Wave IV. The P1 measure showed a big gap oscillating from 52.2% to 33.8% then 51.1% and 35.5% in Waves I to IV respectively. The severity followed a similar pattern. Many Nigerians resort to herbal remedies and faith-based healing, and they only resort to medical attention when their situation becomes critical. Poverty manifests when they abandon their treatment courses due to a lack of enough money to see them through. The introduction of the health insurance system at the Federal level and in many states of the Federation is helping to bring the cost of accessing healthcare down to within the reach of people. The analysis of per capita non-food expenditure revealed a high rate of non-food poverty headcount average of over 70%. The poverty depth was very significant. It started with 55% (0.550) in Wave I, reducing slightly to 52.5% (0.525) before rising to the highest rate of 63.6% in Wave III then reducing to 60.9% by Wave IV. The poverty severity was high as well. The severity rate in Wave I was 48.6% (0.486), it reduced slightly to 45.8% (0.458) before rising to the highest value of 56.0% (0.560) in Wave III before closing at 54.7%. These severity figures portray a situation of intense non-food poverty meaning that the lowest rung of the society was struggling to meet their non-food obligations like transportation. The implication of this is that they spent a lot on necessities, like food and shelter, such that they had little to spend on non-food items. A situation like that can be caused by high inflation. The inflation rate in Nigeria in 2018 was 12.1% and 11.4% in 2019. World Bank (2024). The double-digit inflation priced many

things beyond the reach of many households. Gill and Nagle (2022) stated that "Higher prices can erode the value of real wages and savings, leaving households poorer. But these effects are not felt equally: Low- and middle-income households tend to be more vulnerable to high inflation than wealthier households." Recession could also contribute to this as the Nigerian economy became recessed in 2016, which had a ripple effect on Wave IV. Page et al (2023) stated that "Generally, when we enter recessions, persons with low earnings are hit hard, and poverty—which is measured as the share of persons with income under a threshold thought to provide enough resources to thrive—rises, as does inequality." These would explain the variability experienced in non-food expenditures.

The per capita food expenditure showed mixed results. The per capita food poverty figures were high averaging 68.75%, almost 70%, experienced food poverty. The figure started at 69.6% in Wave I rising to 73.5% in Wave II, then reduced to 59.4% in Wave III then rose to 74.1% in Wave IV. The poverty depth and severity paint the same despairing situation. The poverty depth in Wave I was high at 53.6% and the severity at 47.1%, almost 50%. This worsened in Wave II when the depth deepened to 68.4% and the severity heightened to 67.0%. This could be traced to the rise in the consumer price index which was double digits, 12.2%, in 2012 (World Bank, 2024), that is, at the inception of Wave II. This was observed by Bitler in Page et al. (2023) "Another reason that some groups may be more affected than others is that when inflation occurs, prices do not increase uniformly for all goods or across all places. In the current period, food and oil prices have increased substantially more than prices for many other items." This suggests that food prices may increase more than prices for other items. Bitler also stated that "Households with fixed incomes, such as retirees, also tend to suffer disproportionately during inflation because, unlike wage and salary workers, their incomes cannot adjust to inflation." There was a remarkable recovery in Wave III when the poverty depth improved to 33.5% and the severity to 25.3% showing a more equitable distribution. However, the situation worsened in Wave IV when the depth declined to 68.7% and severity to 67.2%, which was a concerning portrayal of poverty. These acute poverty figures were ripple effects of the 2016 recession in Nigeria. Recession always affects low-income people adversely. Page et al. (2023), said recessions usually hit hard at people with low income thus worsening poverty and inequality.

Table 2: Distribution of Households by the Magnitude of Poverty in the Area

Variable	P₀	P₁	P₂	Poverty line
Per Capita Total Expenditure				
Wave I	0.517	0.205	0.106	55873.28
Wave II	0.574	0.221	0.112	79918.47
Wave III	0.634	0.265	0.142	110847.80
Wave IV	0.585	0.227	0.115	100913.10
Per Capita Education Expenditure				
Wave I	0.711	0.547	0.475	4336.61
Wave II	0.708	0.533	0.455	4269.47
Wave III	0.889	0.816	0.779	2407.77
Wave IV	0.690	0.518	0.440	4752.14
Per Capita Health Expenditure				
Wave I	0.624	0.522	0.484	734.52
Wave II	0.588	0.338	0.259	2964.56

Wave III	0.616	0.511	0.482	592.61
Wave IV	0.561	0.355	0.299	2803.49
Per Capita Non-Food Expenditure				
Wave I	0.711	0.550	0.486	1006.04
Wave II	0.693	0.525	0.458	992.77
Wave III	0.738	0.636	0.560	1603.57
Wave IV	0.754	0.609	0.547	1579.37
Per Capita Food Expenditure				
Wave I	0.696	0.536	0.471	5727.96
Wave II	0.735	0.684	0.670	1028.68
Wave III	0.594	0.335	0.253	3423.05
Wave IV	0.741	0.687	0.672	1027.61

Source: Author's Computation, 2023.

3.3 Income Inequality Severity among the Households

Africa, particularly Nigeria, witnessed a lot of economic growth in the period under study, 2010 to 2019 leading to the slogan, Africa rising (Wu et al., 2024); as highlighted in the background to this study, going by the GNI per capita of Nigeria during this period, Nigerians do not have any reason to be poor if the incomes were distributed more equitably. DFID (2008) stated that economic growth fuels poverty reduction if used well. Wu et al (2024) found that not only does economic growth contribute to poverty reduction, but it also helps in several areas of human development, hence economic growth is central to poverty reduction. Yet, it has long been known in the literature that there can be growth without development. Economic development is about how economic growth impacts the lives of the people in the country that witnesses such growth. In short, it is a measure of the level of structural distortions in the distribution of the wealth generated by growth. It is a reflection of the income inequality in the society. Wu et al (2024) observed that Sub-Saharan Africa, SSA, has a low growth in poverty reduction transmission which is why poverty in SSA has remained inelastic and intractable. This view was validated by Ecker et al. (2023) whose 160 countries study showed that a third of the countries experienced poverty in the middle of phenomenal economic growth. They said "Despite experiencing economic growth post-2020, a third of 160 countries analysed witnessed a surge in extreme poverty. Sub-Saharan Africa is the most adversely affected region, with an average of 130,000 individuals per country moving into extreme poverty per percentage point of GDP growth each year. At the same time, the carbon intensity of GDP (tonnes of CO₂ per US\$1,000) is projected to have increased during 2021-2023 in a third of countries, which are thus failing to decouple emissions from growth." Their submission was that not only did economic growth not translate to poverty reduction, but instead it destroyed the environment in the course of generating such growth. By breaching two of the three legs of sustainable development - social inclusion and environmental preservation, the third leg, that is economic growth is not sustainable. SSA, particularly Nigeria, has therefore witnessed unsustainable growth. In short, there is widespread concern that economic growth in Sub-Saharan Africa is not sufficiently translating into poverty reduction.

It is these ideas that this study examined in the four waves, with the use of the Lorenz Curve and Gini Coefficient as presented in Table 3 and Figures 1 - 4. It has been seen that there was considerable expansion in expenditure in the study period but it was also obvious that poverty

was on the rise. The Lorenz Curves give a visual representation of inequality in the four waves. The Curve has a diagonal line to the origin as the plumbline standard measure. This line is called the Equidistribution line or line of perfect equality. If all the respondents were to fall directly on this line, then it would mean that they all have the same income. The vertical line at the end of the X-axis measures perfect inequality and is called the line of perfect inequality. If all the statistics were to be on that line, then that would mean just one person has all the income and all others have none. The closer the curves are to the diagonal line, the more equitable the distribution; while the farther they are to that line but nearer to the line of perfect inequality, the more unequal they are.

Wave I shows moderate bowing of the curves and therefore represents moderate inequality. The total expenditure bow is the closest to the line of equidistribution, followed by health. Most of the curves clustered close to the line of perfect inequality. Education showed the greatest proximity to perfect inequality. In Wave II, the total expenditure bow was still the least bowed of all the curves. The curves were more dispersed from one another. In Wave III, the curves were even more dispersed with education almost depicting perfect inequality. Wave IV shows a closer total revenue bow. Food and non-food were greatly bowed. An inspection of the curves reveals large-scale and widespread inequalities showing that there were steep inequalities during the study period. It is possible that these inequalities fuelled the pronounced poverty. Policies should be geared towards addressing inequalities as a way of solving widespread poverty.

The Gini coefficients from Table 3 reveal substantial disparities in income distribution across various essential and non-essential expenditure categories among Nigerian households. These insights are crucial for policymakers aiming to design more effective social and economic strategies to reduce inequalities and improve overall welfare. The results offer insights into income inequality within these dimensions: education, health, food, non-food, and total expenditure. The Gini coefficient is a measure of inequality where zero (0) represents perfect equality (everyone has the same income) and one (1) represents perfect inequality (one person has all the income). The Gini coefficient for education exhibits high inequality in all waves, with a peak in Wave III (0.938), suggesting significant disparities in educational investment or access among the households. This peak could reflect either a rise in educational fees or deeper economic disparities affecting educational access at that time. Inequality in health expenditures was relatively lower in Waves II and IV compared to Waves I and III. The lower figures in Wave II (0.581) and Wave IV (0.590) may indicate more equitable access to healthcare services or the effects of health policy reforms aimed at reducing out-of-pocket expenses for the poor. Food inequality was most pronounced in Wave II (0.857) and Wave IV (0.836), with Wave III showing the least inequality (0.569). These fluctuations could be linked to changes in food prices, agricultural output, or subsidy policies affecting food accessibility across different income levels. Inequality in non-food expenditures remained relatively high across all waves, indicating persistent disparities in expenditures on goods and services outside of basic needs. This might include varying access to luxury goods, transportation, and other non-essential services. Total expenditure inequality was considerably lower than the specific categories, suggesting a more balanced distribution of overall spending power despite disparities in specific sectors. Therefore, the varying levels of inequality reflected by the Gini coefficients across different waves and categories underscore the need for targeted policy interventions. Education and non-food expenditures show particularly high levels of inequality, highlighting areas where government policies could focus on improving access and affordability. Additionally, the

significant fluctuations in food security inequality suggest that agricultural and food pricing policies need to be closely monitored and adjusted to ensure more equitable food access.

Table 3: Gini Coefficient Values Across the Waves

Variable	Wave I	Wave II	Wave III	Wave IV
Education	0.780	0.769	0.938	0.758
Health	0.719	0.581	0.746	0.590
Food	0.733	0.857	0.569	0.836
Non-food	0.766	0.723	0.816	0.790
Total expenditure	0.387	0.421	0.443	0.394

Source: Author’s computation, 2023

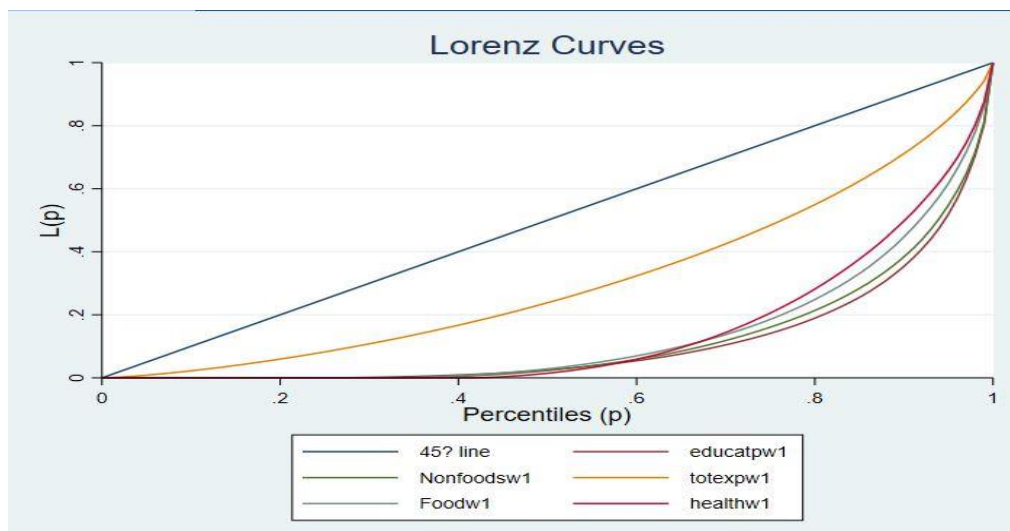


Figure 1: Wave I – the year 2010

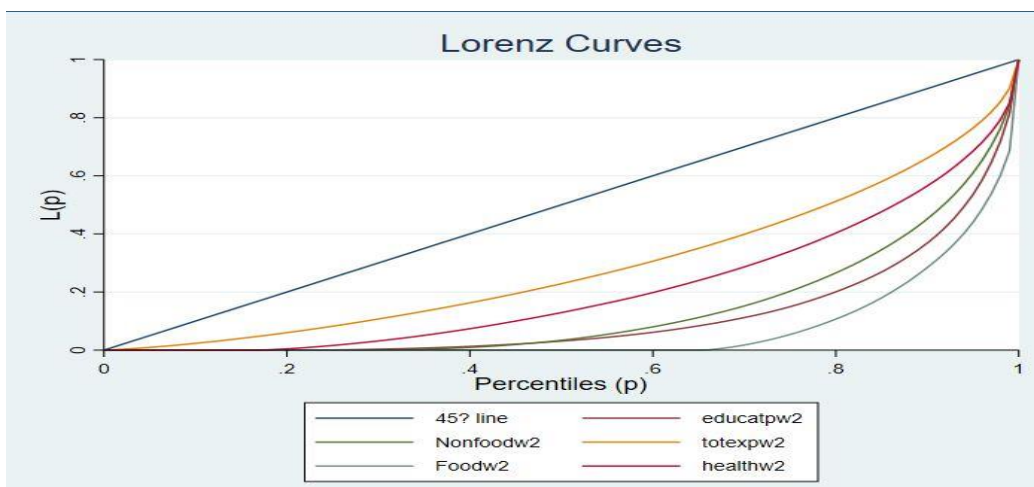


Figure 2: Wave II – year 2012

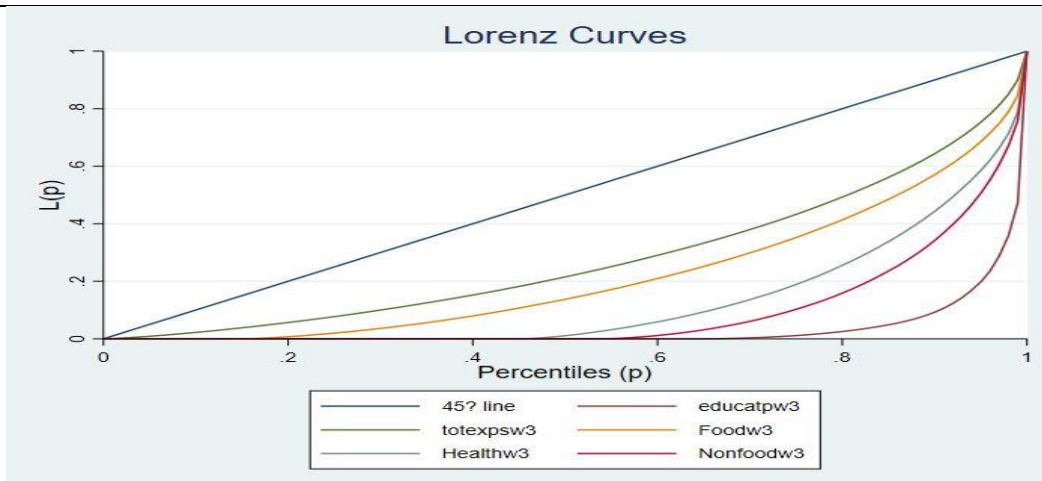


Figure 3: Wave III – year 2015

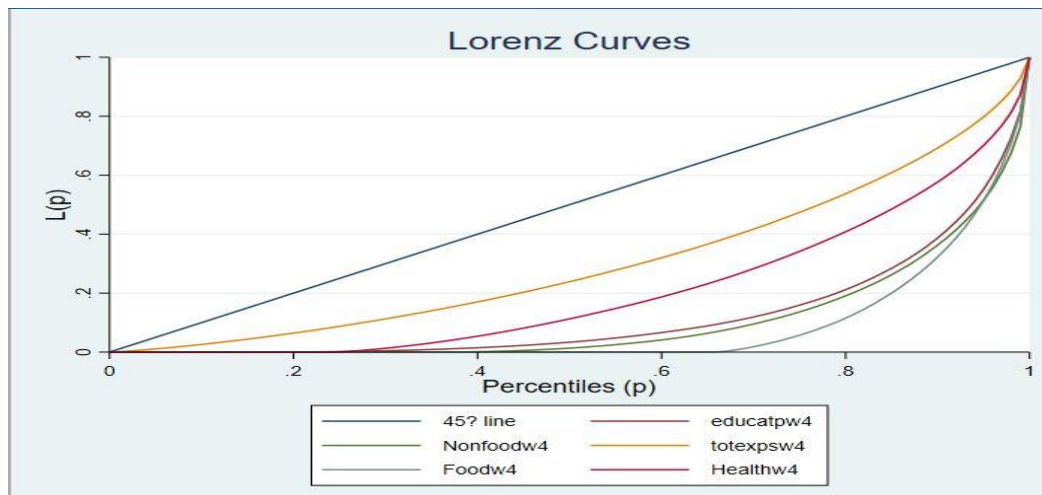


Figure 4: Wave IV – year 2018

4. CONCLUSION AND RECOMMENDATIONS

The high figures of the poor recorded in every wave suggested a high level of chronic poverty when the spell or counting method was used. This means that the poverty alleviation policies mix should be focused more on the chronic poor than on the transient poor. The government should do more than just ask the poor to step out, from time to time, to be registered as poor as this leads to deficient identification of the poor, where many nonpoor and transient poor are registered but chronic poor hardly get registered. A proper identification and documentation of the poor as was done in China should be done in Nigeria.

The P1 figures, at an average of 0.22, show a moderate depth of poverty, which, with appropriate policies and targeting can be reversed and many people lifted out of poverty. It also indicates the presence of many who are transient poor. With the right policy package, they can be assisted to stay out of poverty permanently by building the capacity to withstand economic shocks. The P2 figures, at an average of 0.12 suggest a moderate form of poverty severity, that is, the poor are almost moderately equally poor. This again suggests that Nigeria can tackle its poverty challenges with the appropriate policies.

Still, on a long-term approach to poverty eradication, Nigeria needs to boost agricultural productivity, especially for rural dwellers, and put in place strategies to enhance local business enterprises. Socioeconomic infrastructure like power, water, and roads, which are public goods should be stepped up. Since macroeconomic growth may sometimes translate to poverty reduction, therefore the government should pay attention to macroeconomic stability and growth. Corruption short-circuits the trickling down of economic growth to poverty reduction, therefore corruption should be tackled decisively.

The study:

(a) provided information on why global concerns about poverty, food insecurity, and income inequality have remained intractable in Nigeria. It showed that whereas Nigeria has a large population of chronic poor, yet government had been administering policies that would solve transient poverty and food insecurity but not the chronic ones. This is because there has been no real plan to identify the chronic poor in concrete terms. As a result, the long-term strategies that are required to stem the tide of chronic poverty have not been put in place. This work has shown that Nigeria needs to adopt a vastly different approach to tackling the three challenges of poverty, food insecurity, and income inequality than it currently does. Nigeria needs to adopt long-term solutions and practical steps of physically identifying the poor, then targetting policy solutions towards them as China did.

(b) provided a framework for assessing and intervening among Nigeria's underprivileged. This is the first concurrent study on the dynamics of the triple challenges of poverty, food insecurity, and income inequality in Nigeria over ten years of panel data; and

(c) provided useful insights into immediate practical steps to take to help those trapped in chronic poverty and persistent food insecurity to exit the trap.

The following policy recommendations are proffered based on the findings of this study:

1. The government should give top priority attention to eradicating extreme poverty as China did. Poverty reduction should be strategic and should be a complete comprehensive package. The government should draw up a strategic plan that targets the chronic poor especially. This would entail a change of strategy. The China model should be adapted to suit local circumstances. It should be noted that entrenched chronic poverty requires a long-term plan to eradicate it, not short-term methods.

2. The government should do proper identification and documentation of the chronically poor. After proper identification, short-term and long-term policies to combat chronic poverty should be crafted with inputs from the chronic poor.

3. There should be more initiatives to promote female access and participation in socioeconomic matters, especially in rural areas. In this wise, there should be policies that promote gender equity in economic participation and decision-making within households. Given the noted male preponderance in the study, efforts should focus on supporting female empowerment through education, vocational training, and legal reforms that ensure equal property and inheritance rights, right treatment of widows, anti-child marriage initiatives, and reduction in the high bridal price of marriageable female.

4. The government should enhance ongoing social safety programs to support households with large numbers and high numbers of dependents, which are shown to be more vulnerable to poverty than others. Such integrated intervention could include expanding access to free and comprehensive childcare for under five, basic and qualitative healthcare, and sound public

education, as well as giving targeted family support financial aid to reduce the economic burden on these households.

5. Poverty alleviation programs, like the ongoing National Social Investments Programme, should be programmed by the government to directly tie to economic and labour market conditions. Non-governmental organisations (NGOs) should be encouraged to intervene as well. Programs such as conditional cash transfers, job creation projects particularly in economically depressed regions, and training programs that align with market demands should be enhanced.

6. Comprehensive food security initiatives that stabilize food prices and increase food availability should be developed and implemented among households. The government should solve the insurgency problem which has reduced access to farms and productive enterprises. Support to rural farmers could involve subsidies for farmers, strategic food reserves to buffer against price spikes, and investments in agricultural technology, especially the use of artificial intelligence (AI) to increase productivity.

7. The government should ramp up its initiative to address the issue of out-of-school children and combat insurgency which is halting access to education. The government should invest more in education and make pro-poor policies that would ensure equitable access to quality education, possibly through scholarships, school meal programs, and transportation subsidies for students from low-income families.

8. The government should improve healthcare accessibility and affordability, particularly in rural areas. There is a need to do more in the area of public health insurance, building more healthcare facilities, and subsidizing healthcare costs for low-income households to prevent medical debt and enhance overall health outcomes. A system of social health trust funds should be established and strengthened.

9. There should be a program of integrated rural development that will include socioeconomic infrastructures like water, and energy; boosting agricultural productivity; promoting local businesses, and taking development closer to the rural areas.

10. Anti-corruption enforcement should be stepped up as corruption distorts the economy, promotes income insecurity, and reduces the access of the poor to public goods.

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