

The Dynamics of Income Inequality in Rural Areas in Nigeria

ABSTRACT

The main aim of this study is to measure rural income inequality and assess its disparities across zones, planting periods and socioeconomic characteristics and also to determine the defining factors of income inequality in rural areas. The study employed descriptive and inferential statistics to assess rural households' socioeconomic characteristics, income inequality measurement and its variations across planting periods and socioeconomic characteristics. The study covers 3,164 rural households across the six geopolitical zones in Nigeria. They include; North West, North East, North Central, South West, South East, and South South. In addition, the study designs also features classification based on the two main planting periods in Nigeria which are post-plant periods and post-harvest. Data were extracted from the 2012/2013 General Household Survey under the Living Standard Survey Measurement programme of the World Bank was used for this study. **This study focuses on the wave 2 data released in March 2015.** Data analysis approach include the use of descriptive statistics, Gini and Theil index methodology, regression based decomposition analysis. The result shows that income inequality among rural households in Nigeria is 0.3460 and 0.2500 Gini and Theil index respectively. Among the geographical zones, inequality is highest in the North West with Gini and Theil indices of 0.3726 and 0.4338, and lowest in the North East with Gini and Theil index of 0.2972 and 0.1516 respectively. While the result concludes that rural households are more income insecure in post-plant periods; gender, rural household size and number of dependants are identified contributing factors to rural income inequality in Nigeria. The study however concludes on persisting overdependence on agriculture by rural households, non-exploration of rurality concept to create rural job opportunities as a succour for post-plant income spell, possible inequality in access to skills and educational opportunities across age group and gender.

Keywords: *Income inequality, rural, Nigeria*

1. INTRODUCTION

Income inequality has been described as the defining challenge of our time [1] and has a significant relationship with poverty incidence in a country [2]. On a global view, income inequality is continually on the increase implying a scarce amount of income available for the populace. A recalculated view reveals global income inequality to be about 70 Gini points [3]. Its widening effects in the world today is a necessary evil and becomes more important due to its palpable impact on rural households; not because they constitute majority of poor populace in the world today, but are as well drivers of primary economic growth. Increasing income inequality substantially dispossess people of enough income to have access to proper education and good health services, consequently depriving them of physical and human capital accumulation [4] which can have huge effects on the macroeconomic view of a country. This has been stressed by the International Monetary Fund (IMF) studies of impact of income inequality in emerging and developing countries between the periods of 1980 to 2012 which significantly revealed the negative impact of income inequality on the Gross Domestic Product [5]. Global alertness of inequality has led to building strategies that are inclusive, examples are the EURO 2020 strategy which aims at inclusive approach to benefit the largest possible number of people.

Income inequality in Nigeria has been on the increase since early 1980s [6]. Between 1977 and 1985, trend in inequality was on a sharp increase, and reached a peak of 0.7391 index in 1999 and 2004 [6].

While countries with relative inequality falls between 0.29 and 0.35, Nigeria still lies between 0.50 and 0.70 [7]. At the regional level, inequality is explicitly shown to be above national average of 0.488 in 2010 in the Southern region compared to the Northern region. Regional inequality across the six geopolitical zone between 1985 and 2004 rose from 0.48 to 0.51 (South South), 0.44 to 0.45 (South East), 0.43 to 0.55 (South West), and 0.39 to 0.47, a decrease in North Central 0.41 to 0.39 and North West 0.41 to 0.37 [8]. Comparing rural and urban areas, rural and urban inequality exhibits trend between the same periods, the rural areas consistently increased from 0.39 in 1985 to 0.519 in 2004 [8]. The disparities created by inequality approbate the low income group to poor housing, poor or no access to health, poor educational status etc. While the high income group shares the opposite of the low income group scenarios, the middle class characteristics is between both. Additionally, of growing concern in research is the bipolarization of the income class in Nigeria setting, that is the disappearing of the middle class, this occur as a result of income concentration in two ends or tails [9], in this case, the high income and the low income tail. Clementi *et al.*, (2014) observed a sharp increase in polarization between the six geopolitical zones in Nigeria with a higher reflection in the upper income class in the South-South and South West zone region and a higher concentration in the lower income class in North East and North –West zones. [10] established a slightly differential levels in urban and rural areas, 0.25 and 0.24 respectively, with identified increasing polarization in the country caused by increasing unemployment, number of retirees and number of secondary school leavers.

Policies and programmes such as the Structural Adjustment Programme (SAP) of 1980s, the National Economic Empowerment and Development Strategies (NEEDS) in 2004, the green revolution, Operation Feed the Nation (OFN) among others have failed to achieved targeted aims. As a result, incidences of poverty and inequalities have been prevalent, prominent ones were recorded in 1985 – 1992 and 1996 – 2004 [11]. With a record of 36.2% Human Poverty Index (HPI) in 2009, Nigeria was rated the 7th poorest country in the world [12], with prior history of worsening indices of income inequality between the periods of 1980, 1985 and 1996 were stated as 28.1, 46.3 and 65.6 percent. It worsened after the Structural Adjustment Programme in 1986 [12] with a ginii points of 65.6, 58.3 and 69 percent in 1996, 2005 and 2010 respectively [13]. However a record of 42.9 was made in 2004 which further increased to 44.7 in 2010 [13]. Of important causality of persisting rural income inequality, the failure to embrace the changing roles of rurality in Nigeria. Rurality concept has been solely attached to primary activities like agriculture. Policies have been defined to aid agricultural development with the hopes that the rural areas are as well developed. However, over the years, increasing income inequality in rural areas in Nigeria brings to light the need to redefine the concept of rurality as certain rural households engage in varying non-farm income activities. This further revealed the underutilization of the rural resources and the need to redefine the rurality concept, this study justifies this opinion by assessing income inequality in post-plant and post-harvest seasons and further addressing the need to redefine rural concept to solve the problems of inequality in the rural areas in Nigeria. Most significant is that the rural households constitute the largest share of the populace in most developing countries like Nigeria involve in primary activities. In Nigeria, the rural households constitute 53% [14]; the largest share of the populace in Nigeria and agrarian community. The rural households highly depends on agriculture which contributes about 40% to the country's GDP and thus serves as a means of income to a wider range of its populace [15]. In this vein, income variation at the rural level portends great danger to the economic status of the country [16].

The multiplier effect of poverty has prompted various studies on income inequality. In order to understand the basis on which to lay this study, there is need to review related literatures based on their various approach in the methodology, data usage and application. Gini coefficient is one of the measurement of income inequality in Nigeria, this was used in [17], in the study of measurement and sources of income inequality in rural and urban Nigeria using secondary data from the household survey data of the Nigeria Bureau of Statistics. It was discovered that the total income recorded a Gini inequality index of 0.58 for rural and 0.52 for urban which showed that income inequality in Nigeria is on the high ends. It was also discovered that income inequality increased poverty between 1998 and 2004 in Nigeria. By [18], a higher Gini coefficient of 0.67 is illustrated in rural household study in Abia state which is in the South-Eastern geo-political zone of Nigeria. [16] employed descriptive statistics, Lorenz curve and Gini coefficients to examine rural households' income distribution and level of inequality in Ekiti State in South Western part of Nigeria. The result was an unequal distribution with a Gini coefficient of 0.3570. However, income and household size are positively significant factors of unequal income distribution, while marital status and

primary education are negatively significant. [19] characterized the structure of inequality of rural areas in Nigeria by the household per capita expenditure. Using household as the unit of analysis, households were decomposed into a 'within group' and between group' components. It was argued that decomposability allows the partitioning of inequality into sub-groups [19].

In measuring inequality, the expenditure based approach was employed due to the variation of income at the level of rural households. The study discovered that age, gender, education and level of household head as determinants of inequality in the country. Certain socioeconomic attributes has been discovered to be persistently significant sources of income inequality, one, two or more can include age, gender and educational level of household head, household size, income source, and seasonality as determinants of inequality in the country ([19]; [18]; [20]). On the basis of gender, female rural households head have more evenly distributed income compared to male household head, higher, however, the number of dependants and household size are culpable of putting more households below the poverty line [21]. In order to bridge the knowledge gap on the present level and determinants of rural income inequality in rural areas, a study of income differentials in rural households in Nigeria becomes more important, it is also required for rural economic development.

Policies and programmes failure at the rural level can be traced to the concept of rurality in Nigeria still tied to agriculture. To a very large extent, the concept of rurality is yet to be redefined to clarify its differing functions from sole agriculture. From time past, policies for agricultural development have been assumed to as well develop the rural areas and improve rural socioeconomic status, but these policies have failed severally and the rural areas still lacks basic social, economic and environmental needs. Additionally, certain rural households have found succour in engaging in off/non-farm activities, this can be attributed to rural farm households needs to spread risk, ensure income security especially in post-plant periods. It is however important to keep an update on corroborating past studies on measurement of income inequalities in rural areas in Nigeria with specific target on variation in post plant and post-harvest periods. This study will make recommendations to policy makers to restructure the rural sector. Policy makers will see the need to redefine the concept of rurality as encompassing and not agriculturally dependent. This will enable them to promote non and off-farm activities by improving the agricultural value chain for better rural economic structures. It will also contribute to government, non-governmental and NGOs policies in modelling rural inclusive socioeconomic policies, separating rural activities from agricultural activities. Also, an important focus is creating policies to harness regional integration for equal income opportunities among regions in Nigeria. The objectives of the study are as follows:

1. To profile the socioeconomic characteristics of rural households in Nigeria;
2. To measure income inequality of rural households in general and based on plant seasons;
3. To decompose income inequality according to regions (Geo-Political Zones), plant season and socioeconomic characteristics;
4. To estimate rural socioeconomic determinants of income inequality in Nigeria.

2.0 MATERIALS AND METHODS

2.1 Scope of the Study

This study covers rural areas in Nigeria. Nigeria is located in the Western region of Africa (see figure1) and occupies a land area of 923, 768 square Kilometres. It is bounded by Benin Republic, Niger republic, Cameroun and the Atlantic Ocean to the West, North, East and South respectively (see figure 1). There are six regions known as geopolitical zones (North West, North East, North Central, South West, South East and South South) with 36 states (see figure 2) and 774 local governments in total. Across the geopolitical zone, Nigeria has varying agro-climatic zones which makes it suitable for production of varying agricultural crops and livestock. The mangrove and rainforest is found in the Southern region of Nigeria, existing towards the Northern region is the savanna (Guinea, Sahel and Sahel Savanna). The climate is arid in the extreme North East, semi-arid in some parts of North West and North East, sub-humid and humid climatic conditions can be found in the southern region. The Southern region has high humidity with mean temperature of 30°C to 32°C and 33°C to 35°C in the North. The population of Nigeria is about 177.5 million.



Figure 1: Map of Africa showing the location of Nigeria.[22]
Source: <http://catalog.flatworldknowledge.com>

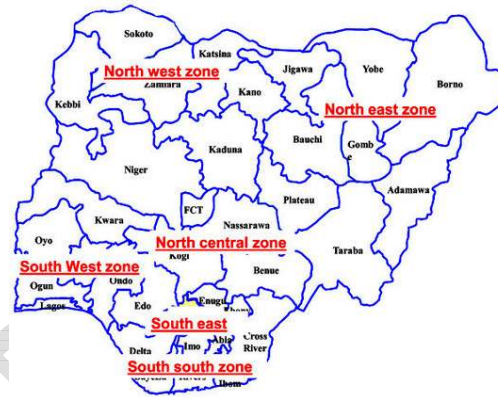


Figure 2: Map of Nigeria showing geographical zones and states [23]
Source: <http://www.africaprimenews.com>

2.2 Data

The data used in this study were extracted from the Living Standard Measurement Survey-Integrated Surveys on Agriculture (LSMS-ISA). The LSMS-ISA is a project that foster innovations and efficiency in statistical research on the links between agriculture and poverty reduction. The LSMS-ISA survey is established by Bill and Melinda Gates Foundation and implemented by the LSMS team in Burkina Faso, Ethiopia, Malawi, Mali, Niger, Nigeria, Tanzania and Uganda. In Nigeria, the LSMS-ISA works with the national representative which is the Nigeria Bureau of Statistics to implement General Household Survey (GHS) Panel. The data consists of two phases described as waves, the Wave 1 data was released in June 2011, while wave 2 data was released in January 2015. The objective of the GHS panel which is key to this research is to improve the production of household level agriculture statistics linked with non-agriculture dimensions of household welfare and behavior. And also to foster the dissemination of this data. The GHS covers for 22,000 households and it is carried out annually in February to March 2013 (5,000 panel and 17,000 non-panel households). The GHS is representative at the national level and for

the six geopolitical zones in Nigeria, but not representatives at the state level. This study used 2012/2013 GHS panel data (Wave 2), released in 2015 with focus on the rural domain. The reason for using this data is that, it is a comprehensive report suitable for research and serves as the main national data for the country, also due to the reliability of the data. Most importantly it captures waves of income flow which is important for this study. Each Wave also comes in two seasons, the post plant collated in November 2012 and post-harvest, February – April 2013. The Wave 2 purpose built on re-interviewing the households and individuals interviewed in Wave 1. To suffice for inadequacy like movement of households after Wave 1 survey, the team either tracked households that moved to a new dwelling or communities, but no tracking of individuals that moved out. In total, 4716 households (1465- urban and 3251 rural), inclusive is 126 and 90 tracked urban and rural households as shown in the table 1 below. After data cleaning, 3164 rural households constituted the sample size for this study.

TABLE 1: NUMBER OF URBAN AND RURAL HOUSEHOLDS RESPONDENTS IN EACH GEOPOLITICAL ZONE IN NIGERIA.

Geopolitical Zones	Wave 1			Wave 2		
	Urban	Rural	Total	Urban	Rural	Total
North Central	217	577	784	214	570	784
North East	138	659	741	117	624	741
North West	170	728	878	156	722	878
South East	204	590	763	197	566	763
South South	229	540	761	219	542	761
South West	611	253	789	562	227	789
	1569	3347	4716	1465	3251	4716

Source: LSMS-ISA Nigeria (2015)

2.3 Defining Variables.

In order to capture the rural households income effectively, income is proxied by expenditure, this is due to income variation especially at the rural household. This is also due to availability of data more on households' expenditures rather than a fixed source of income. The post plant and post-harvest data are proxied to indicate income flow differentials as a result of possible flow of income from non/off farm activities. The variables extracted include: Household total expenditure, household per capita expenditure, and household expenditure in post- plant period, household expenditure in post-harvest period, number of dependants, gender, household size, age of household head and marital status of household head.

2.4 Methods of Analysis

The method of analysis to be employed include descriptive statistics, Gini and Theil index and regression decomposition analysis. The first objective will be realized by using descriptive statistics such as frequency, percentages, mean and standard deviation to analyse households' socioeconomic characteristics. The second objectives will use the Lorenz curve, Gini coefficient and Theil index to measure income inequality and its distribution based on geo-political zones and post-plant and post-harvest periods. Gini and Theil index corroborates the decomposition of 'within' and 'between' groups. The second objective employed income inequality decomposition analysis based on socioeconomic characteristics such as household size, gender, age, and marital status.

2.4.1 The Gini Index

The Gini index (see equation 1.) which provides appropriate standard for measurement of inequality and it is as well the most commonly used economic measures. The model of Gini Coefficient is:

$$I_{gini}(y) = \sum_{i=1}^n a_i(Y)Y \text{ where } a_i(Y_i) = \frac{2}{n^2\mu} \left[i - \frac{n+1}{2} \right] y_i \dots\dots\dots \text{equation 1}$$

Where n = number of observation
 Where μ = mean of the distribution
 Y_i = income of the j th household
 I_{gini} = income Gini.

2.4.2 Theil Index

For this study, the two income inequality measures used are the Gini coefficient and the Theil Index. The Gini index is widely used and Theil index is important for group decomposition. In the decomposability form, it is represented as the 'between' and 'within'. Decomposability is an important feature of inequality measurement. It expresses the contribution of sub-groups to total inequality. While the within inequality captures the variability within each group, the between inequality expresses the inequality across groups. A general decomposed inequality index (equation 2.) consists of the within, between and a residual, it is represented as:

$$I = I_{\text{WITHIN}} + I_{\text{BETWEEN}} + K_{\text{RESIDUAL}} \quad \text{equation 2}$$

Theil index is referred to as an entropy measure. Literarily, it depicts the measurement of disorderliness, just like similar concept of inequality, it measures the deviations from perfect inequality. While the Gini index is able to compare between units and sizes of populations, it does not apply to grouped data, in situation where it does, it leaves a residual. The Theil index is able to split within and between group components of data, this is called perfect decomposability (equation 3.). It is defined as:

$$E(1) = \frac{1}{n} \sum_i \left(\frac{y_i}{\bar{y}} \right) \ln \left(\frac{y_i}{\bar{y}} \right) \quad \text{equation 3}$$

Where y_i is income of individual, ' i ' is the average income of the population, ' n ' is the number of population.

The decomposition form of the Theil index (equation 4.) is represented thus:

$$T = \underbrace{\sum_{k=1}^m \left(\frac{n_k}{n} \frac{\bar{y}_k}{\bar{y}} \right) T_k}_{\text{WITHIN}} + \underbrace{\sum_{k=1}^m \frac{n_k}{n} \left(\frac{\bar{y}_k}{\bar{y}} \right) \ln \left(\frac{\bar{y}_k}{\bar{y}} \right)}_{\text{BETWEEN}} \quad \text{equation 4}$$

Where y^k is the individual income and ' n ' is the number of population.

In regional decomposition, the first sub-groups will include two regions, the Northern region (North-Central, North-West, and North East) and the Southern region (South West, South East, and South-South). The second and third sub-groups will include gender (Male and Female). The fourth will include household size and number of dependants, age and marital status.

2.4.3 Regression Based Inequality Decomposition Method

The regression based decomposition is an important tool for explaining the structure of income and their distributions. It depicts the impact of individual/households or group differences on their inequality. It was proposed by Fields (2000) and Morduch and Sicular (2002) as cited Almas 2004 is stated below (see equation 5).

$$S^k = B^k \left(\frac{\sum_{i=1}^n a_i(Y) Y^k}{I(Y)} \right) \quad \text{equation 5}$$

Where a_i = weight attached to individual i income component k , Y^k

B^k = The estimated explanatory variables.

S^k = proportional contribution of the source k to overall inequality

This regression based decomposition analysis relies on linear regression functional form and also considers differences in mean outcomes which are its basic shortcomings.

2.4.4 The Lorenz Curve

The Lorenz curve shows the relationship between the percentage of income recipients and the percentage of the total income during a given year. The Lorenz curve shows the 45 degree ray represents the line of equality or line of perfection, it is a line at which all individual are at the same income level and the line of curvature shows the unequal income distributions.

The basic interpretation for this is that the closer the line of curvature to the line of perfection, the lower the inequality and vice-versa. The Lorenz curve is modelled to range from 0 to 1. The Lorenz curve has a shortcoming of not clearly identifying dominance relationships, these are quite apparent in the Generalised Lorenz curve. While the Lorenz curve measure from 0 to 1 the Generalised Lorenz Curve) measures from 0 to the mean as shown in equation 2.

$$GL(y, p) = \mu L(y, p) \quad \text{equation 6}$$

Where GL = Generalised Lorenz

L = Lorenz curve

y = income share and p = population share.

μ = mean of income

3. RESULTS AND DISCUSSION

3.1 DESCRIPTIVE STATISTICS OF SOCIOECONOMIC CHARACTERISTICS OF RURAL HOUSEHOLDS

Table 2 discusses the socioeconomic characteristics of rural households in Nigeria. It can be seen that the rural household is a typical large one with an average household size of 6. The mean age of rural household head is 52.25 years. While the average number of dependants is 3, with maximum of 16, household annual aggregated income is 476,082 Nigerian Naira (NGN) which is equivalent to 2,145.35 Euros with a percapita income of 91467.15 (412.18 Euros). Additionally, household income and percapita income varies seasonally; income in post-plant and post-harvest season is 677,138 (3,051.37 Euros) and 514,173 (2,317.00 Euros) with percapita income of 131, 464 (592.41 Euros) and 97,341(438.64 Euros) respectively.

What are the implications of some these results, particularly, the differences in post plant and post harvest incomes? There is every need to show this in your discussion.

Table 2 Summary Statistics of Socioeconomic continuous variables of rural households in Nigeria.

Variables	Mean	Standard Deviation	Maximum	Minimum
Number of dependants (persons)	3	2	16	0
Household Size (persons)	6	3	26	1
Age of Household head (years)	52.24	15.1	20	110
Annual aggregated household income (NGN)	476,082	590,190.2	27,800,000	14,300.39
Per-capita income (NGN)	91,467.15	105,607.40	4,639,410	7,150.20
Total Household income in post-plant season (NGN)	677,137.57	1,323,455.49	67,900,000	14,582.59
Total household income in post-harvest season (NGN)	514,173.09	396,215.71	5,911,873	13,728.54
Per-capita income in post-plant season (NGN)	131,464.23	224,939.28	11,300,000	3,952.18
Per-capita income in post-harvest season (NGN)	97,341.25	87,732.47	1,426,366	4,867.54
Continuous Variables	Frequency	Percentage		

Gender	2717	85.9
Male Household Head		
Female Household Head	447	14.1
Total	3164	100
Age		
20 to 40	798	25.2
41 to 60	1488	47.2
60 <	878	27.7
Marital status		
Married	2545	80.4
Never Married	58	1.8
Separated	54	1.7
Widowed	434	13.7
Divorced	21	0.7
Missing	52	1.6
Total	3164	100

NGN: Nigerian Naira. Euro equivalent uses March 2015 exchange rate.

Source: Computed by Author based on LSMS Data 2015.

3.2 INCOME INEQUALITY MEASUREMENT OF RURAL HOUSEHOLD IN NIGERIA.

Gini and Theil indices of rural households in Nigeria in 2013 are 0.3460 and 0.2500 respectively. This shows that rural income inequality though still high, has decreased compared to measures of 0.5808 as stated in Oyekale *et al.*, 2006. The relative Theil index depicts that income inequality in rural household constitutes 3.1 percent of the maximum inequality. The cumulative share of rural households' in Nigeria is depicted by the Lorenz curve in figure 3 below. From the Lorenz curve, one of the highest points of income inequality can be seen at the 0.6 percentile of which cumulative rural households' population have income share less than 0.4 percentile.

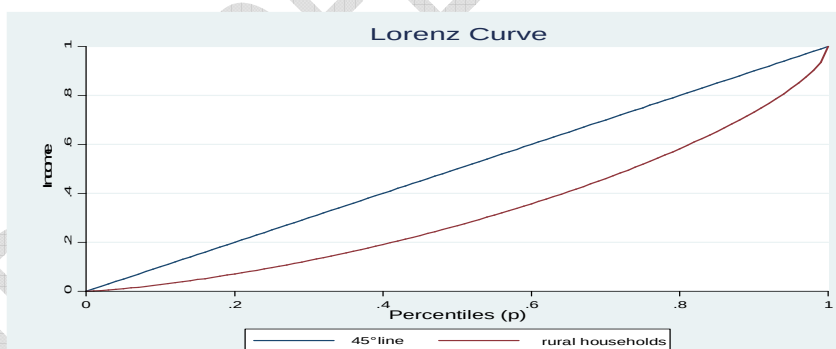


Figure 3: Lorenz curve of rural households' income (NGN) in Nigeria, 2013

Source: Computed by Author based on LSMS data, 2015

3.3 DECOMPOSITION ANALYSIS OF INCOME INEQUALITY

From the result of the study, both Gini and Theil indices gives the same interpretation. Among the zones, income inequality is highest in the North West with Gini and Theil indices of 0.3726 and 0.4338, and lowest in the North East with Gini and Theil index of 0.2972 and 0.1516 respectively. While the South West has the second lowest income inequality with a Gini and Theil index of 0.3191 and 0.1694 respectively; the South-South has the second highest income inequality with Gini and Theil index of 0.3626 and 0.2421 respectively (see figure 4).

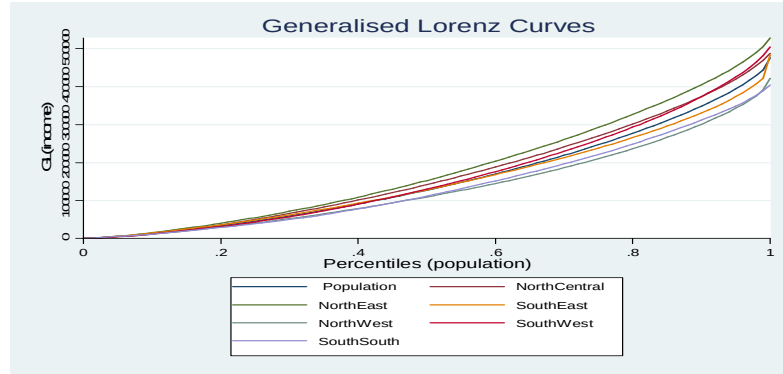


Figure 4: Generalised Lorenz curve of rural households head according to geopolitical zones.

Source: Author's computation based on LSMS data 2015.

However, only the North West, South-South and South-East are above the calculated Gini index of rural areas in Nigeria (0.3460). Additionally, while the North West has the highest population share of 22.38%, the South West has the lowest population share of 3.5%. However, the South West has the highest income share (29.5%), while the South-East has the lowest income share of 15.59%. The relative contribution of Gini and Theil shows that the Northwest contributes highest (5.5% for Gini, 6.6% for Theil) to the maximum inequality while the South West contributes lowest. From the generalized Lorenz curve, it can be seen that the zone with the lowest inequality index which is the North East is closest to the arbitrary 45⁰ line and the North West is the farthest. In assessing differentials in seasons, rural households have higher income inequality in post-plant periods (0.3824) than in post-harvest period (0.3694) (see figure 5).

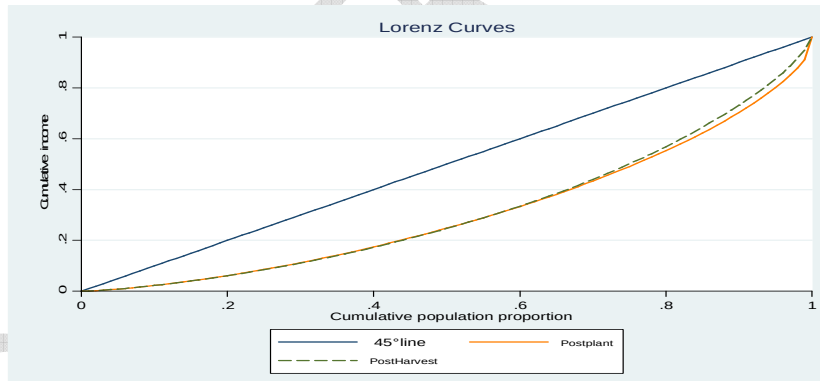


Figure 5: Lorenz curve of rural households in Post-Plant and Post-Harvest Season

Source: Author's computation based on LSMS data 2015

This could be due to shortage in farm income and possibilities of few farmers to engage in non-farm activities more in post plant periods. It is also important to note the possible impact of high dependency on sole agriculture of rural households in Nigeria. This is coherent with [24] findings, which indicated rural dependency on agriculture, underutilized resources and influence of political elites as rebuttal cause of inequality. To corroborate the result, few rural farm households who engage in non-farm activities can likely increase differentials in income distribution. This also suggests there is high possibility of certain rural households to fall below the poverty line in post plant periods. While source of income in both seasons is an indicator of increase or decrease in rural income inequality, this finding also depicts the possible impact of rural areas multifunctional activities on income distribution and equality assessment. It can be seen that sole dependence on agriculture can leave rural households more income insecure, exploring other functions of rural areas can increase their income level and close the inequality gap. This suggests that the Nigeria rural households are yet to move in full force with the wave of changing roles of rural areas to adjust for seasonal impacts on income.

Gender is a cogent issue in sustainable development, it is a key element of inclusive growth. However, in this study, female household head have a higher income inequality (gini index of 0.362) than the male household head (gini index of 0.3356)(see figure 6).

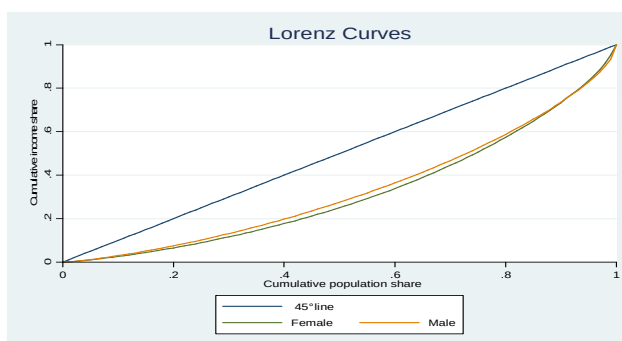


Figure 6: Lorenz curve of rural households head gender
Source: Author's computation based on LSMS data 2015

Additionally, the male household head have a higher income share; 90.28% than the female household head; 9.7%. From the relative theil index, it can be seen that the female household head contributes more (3.6%) to maximum income inequality than the male (3.0%). The between and within group inequality across gender shows that inequality within the gender group accounts for the greater proportion of observed inequality, while the differences between the groups accounts for 0.9%.

To decompose household size, the household size is grouped into two with reference to the mean rural household size. below shows that rural household size above the average has higher income inequality with Gini index of 0.3622 and Theil index of 0.2976 while rural households size below rural average have lower income inequality of 0.3356 and Theil index of 0.1619 This depicts that household size is a contributing factor to income inequality (see figure 7).

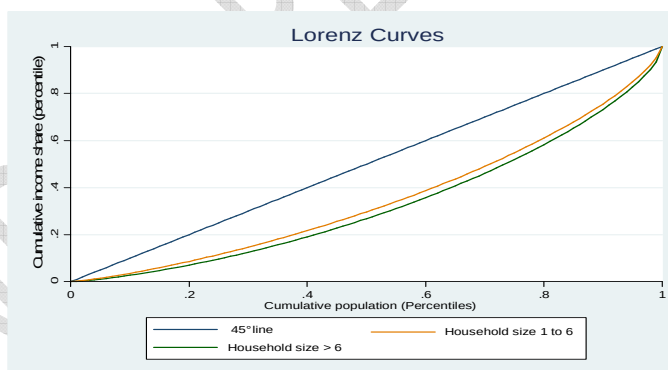


Figure 7: Lorenz curve of rural households' size
Source: Author's computation based on LSMS data 2015

Additionally, the within-between group analysis shows that income inequality is higher within group than between group. While the age group 20 to 40 have the highest income inequality (0.3745, 0.3945), age group 41 to 60 have the highest income share and relative inequality contribution. The inequality contribution within and between group is 0.3588 and 0.0649 respectively. The economic effect of marital status cannot be totally disregarded, marital status formed part of socioeconomic characteristics in this study. From the decomposition analysis, rural household head that are not divorced and separated have the highest income inequality. The never married status have the lowest income inequality, this study concludes that the factor of dependants might play a role in this. The Married group have the highest

income and population share. The Within-Between group inequality analysis shows that income inequality is highest between group.

3.4 Assessing the impact of rural household socioeconomic characteristics on income inequality using the regression based decomposition analysis.

From this study, it was discovered that number of dependants, household size, and gender of rural household head are significant socioeconomic factors that influences rural income inequality. Household size is positively signed at 1% significant level. This depicts that a higher household size means a higher income inequality. Also, gender is positively signed and significant; this means that the gender of household head has a significant impact on rural income inequality. However, number of dependants is negatively signed and significant at 1%, its interpretation is economically weird as it means that a higher number of dependants decreases income inequality. One could look at this from perspectives of a higher income does not imply lower inequality. However could mean a lower share of income among the populace which is closer to equality. Although the model is fitted as shown by the significant F-statistics, the R-squared only explains 5.3% of the variation in the dependent variable which is quite weak. However, this further justifies the multidimensionality of income inequality and shows that there is a need for comprehensive data collection on exogenous and endogenous variables to actually define the main determinants of income disparities at the rural household levels.

Table 4 Assessing the impact of households' socioeconomic characteristics on income inequality

Variables	Coefficients	Standard Error	T-value	Sig. level
Age	-496.9597	709.8545	-0.70	0.484
Marital Status	6324.941	9868.467	0.64	0.522
Gender	57090.48	31737.26	1.80	0.072***
Number of dependants	-27019.44	7621.502	-3.55	-0.000*
Household Size	54712.29	5382.952	10.16	0.000*
Constant	191089.60	50034.26	3.82	0.000
R Squared : 0.053 Adjusted R-Squared: 0.0537 F-statistics: 36.32				
Prob > F : 0.000				

*1 percent, **5 percent, ***10%

Source: Author's computation based on LSMS Data 2015.

4. CONCLUSION

This study shows that income inequality changes within and across zones, socioeconomic groups and planting periods in rural areas in Nigeria. On a general ground, income inequality is still high, though has decreased compared to earlier studies. In this study, the North-West, South-South and South East have the next high income inequality indices in stated order. A further investigation shows a more in-depth income inequality higher between the zones than within. It is recommended that there is a need for the country to venture into regional integrational policies and programmes at the rural areas. Furthermore, the planting periods income inequality analyses depicts income differentials due to the reflection of the changing roles of agriculture and rurality. It shows that rural households have a high tendency of being income insecure in the post-plant period. It is however recommended that there is a need for restructuring rurality concept in the Nigeria system. For example, promoting rural tourism, creating off and non-farm employment. To accomplish this, integrating rural policies and programmes are needed across zones, and policies and programmes should be non-conflicting with agricultural policies. From the decomposition analysis across gender, this study concludes that female household head group have higher income inequality than the male household head. Also, between this groups, the within inequality contributes more to the overall inequality. It is recommended that disbursement of policies at grassroot levels should take gender into consideration. There is a further need to study important factors of inequality within gender groups. As important as household size is for family labour in the rural areas since time past, its

impact on rural income inequality has been stated by this study to be positive. Rural household with more than average household size have higher income inequality. Increasing household size tend to increase the number of dependants in a household. In the age group analysis, household head in the age group of 20 to 40 have the highest income inequality, of notice is that income inequality decreases with increasing age. The age group 41-60 have the highest population and income share. The within inequality contribution is quite high, this depicts a wide gap in income acquisition within age groups. This could mean traces of unequal experiences, skills, education etc. It is recommended that policies should create equal access to educational opportunities, skills and entrepreneurial activities across age groups. From the impact analysis using the regression based decomposition approach, the study concludes that gender, number of dependants and household size are important socioeconomic factors determining the rural income inequality. Policymakers need to strategically ensure the use of gender-aligned rural policies and programmes. Government policies to address population control mechanism, most importantly widen the concept of rurality in Nigeria beyond its parochial view, this is to encourage productivity in other rural sector such as tourism, local products making etc., With this the shock wave of insecure income in post-plant periods can be curb.. For further study, it is recommended to study comprehensively varying source of rural income effect on income inequality.

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