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ANALYSIS OF RURAL INCOME INEQUALITY IN NIGERIA: BEFORE AND DURING THE DEMOCRATIC ERA

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Abstract

Income inequality is a global issue affecting all and sundry across the globe in both developed and developing economies. It could result in a high probability of revolution, high rent-seeking policies, a breakdown of social cohesion and a signal of low democracy. Democracy as a form of government was created to ensure that every citizen enjoys the dividends of government. If this is true, democracy should therefore serve to reduce income inequality in the world. The extent to which this is true for Nigeria is yet to get sufficient research interest. Therefore, this study examined the income inequalities in rural Nigeria before and during the democratic era and measured the contributions of different socio-economic factors to income inequality. This study utilized the General Household Survey Panel and the National Consumers Survey data. This study employed the Gini coefficient, theil index, Lorenz curve, and the regression-based inequality decomposition method as techniques of data analysis. The result revealed that income inequality had decreased by 6% from the pre-democratic era to the current democratic era. The proportion of middle-class population has increased by 1.35%. The years of education contributed the most to total inequality (23.5%), the dependency ratio contributed -15.3%, age contributed -0.59%, household size contributed 6.2%, gender of household head contributed 0.03%, and marital status contributed 0.1% to the total income inequality. There is thus a need to gear programmes and policies to boost the education system, empower women and strengthen democratic institutions to ensure income equality.

Key words*: *democracy, determinants, Gini coefficient, income inequality, rural Nigeria

INTRODUCTION

Income inequality is a global issue affecting all and sundry across the globe in both developed and developing economies. This makes it appear in the Sustainable Development Goals (SDG 10). The high rate of inequality globally, with its implications for macroeconomic stability and economic growth, is of great concern to academics and policymakers [1, 2]. Income inequality has a significant relationship with the incidence of poverty within a population. Omotola and Kabir [24] opined that the increasing rate of poverty and income inequality has been a major concern among economists and policy experts because they are the major factors hindering the development of any nation. Income inequality and poverty contributes to the halting of the globalization process [26].

Widening income inequality is a defining challenge that calls for urgent attention across the board as it has a significant effect on political and economic stability. Sub-Saharan African countries have recorded the highest income inequality level in recent years. The human development index (HDI) for Africa increased very marginally from 0.366 in 1980 to 0.561 in 2020, which has, however, been the worst since 1980 as compared to other regions [24, 30, 31]. Nigeria was categorized as a low human development country due to its low lifespan, education level, and gross national income per capita [14]. Evidence abounds that shows that income inequalities and poverty are at a high rate, especially in the rural areas where the majority are engaged in farming. In Nigeria, income inequality has been on the rise since as far back as the early 1980s, during the second republic. The trend was on a sharp rise between 1977 and 1985 and reached a peak index of 0.7391 in 1999 and 2004 [6, 22, 23]. The country also recorded a Gini index of 58.3% and 69% in 2005 and 2010, respectively [32]. In addition, Nigeria was ranked 161st in the world with an HDI of 0.539 in 2020 [31].

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Nigeria is regarded as Africa's largest economy, but more than 40% of the population lives in poverty, while a few high-income earners control a larger proportion of the wealth and are constantly increasing wealth [19, 21]. This shows a high level of income inequality in the country. A high level of income inequality could result in a low level of democracy, a high probability of revolution, and high rent-seeking policies [28]. Income inequality, which can break down social cohesion and cause an economy to fall into a vicious cycle, can also endanger democratic institutions [28]. Democracy as a form of government was created to ensure that every citizen enjoys the dividends of government. The dividend of democracy is expected to trickle down to every individual in the nation. If this is true, democracy should, therefore, serve to reduce income inequality in the country. The extent to which this is true for Nigeria is yet to get sufficient research interest as previous studies on Nigeria's income inequality did not show if democracy had reduced the level of income inequality in the country [5, 29].

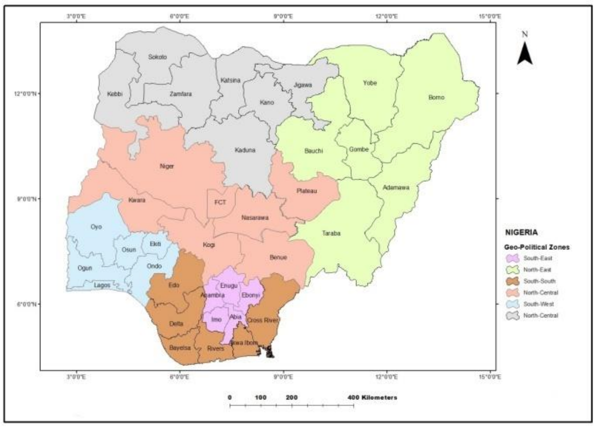
The present study, therefore, analysed the income inequality across regions in rural Nigeria before and during the fourth republic (democratic era) by providing insight into whether subsequent governments in the fourth republic have been implementing the right policies to stem the tide of income inequality. Specifically, the study: profiled the socioeconomic features of rural households in Nigeria; measured the income inequality and income shares in rural Nigeria before and during the democratic era; and decomposed the income inequality to measure the contribution of different socio-economic factors to income inequality.

Identifying factors responsible for income inequality is of great importance to addressing the issue of income inequality by tailoring policies and programmes towards them.

Thus, this research will be of great importance to governments and policymakers to reduce income inequality in the short run and eradicate it in the long run.

MATERIALS AND METHODS

The study area is Nigeria (Map 1). Nigeria is the most populous country and largest economy in Africa. The major livelihood of the larger population is agriculture and allied activities, especially among rural households [9, 15].



Map 1. Map of Nigeria showing the six geological zones
Source: EnvironReview [11].

This study used data from the recent General Household Survey (GHS) Panel, and the National Consumers Survey (NCS) contained in the Poverty Profile of Nigeria (1985–1996), both gotten from the Nigeria Bureau of Statistics (NBS). The GHS was used to represent the democratic era, while the NCS of 1996 was used because it was the last National Consumer Survey before the transition to the 4th republic (democratic era). The data usedin this study covered 3,112 rural households across the six geopolitical zones of Nigeria.

18.22% of the households surveyed were from the North-Central, 17.29% from the North-East, 23.17% from the North-West, 17.99% from the South-East, 16.42% from the South-South and 6.91% from the South-West.

In this study, the Gini coefficient and theil index were employed to measure income inequality before and during democracy.

A regression-based inequality decomposition method was used to measure the contribution of socioeconomic factors to income inequality.

The Gini coefficient measures inequality based on the Lorenz curve. It is the ratio of the area between the equality line and the Lorenz curve, and the total area under the equality line.

It has values ranging from 0 to 1. 0 signifies absolute equality in income distribution while 1 signifies perfect income inequality. Values closer to 0 indicate more income equality distribution while values closer to 1 indicate higher income inequality distribution. The Gini coefficient is the most commonly used economic measure of inequality. It has been widely used by researchers in measuring income inequality [5, 12, 13, 27, 29]. It is expressed as:

$$\mathrm{G} = 1 - \sum(\mathrm{Hh_i} + 1 - \mathrm{Hh_i})(\mathrm{Inc_i} - \mathrm{Inc_i} + 1) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(1)}$$

where:

$\mathrm{Hh_i}$ is the cumulative percentage of households, $\mathrm{Inc_i}$ is the cumulative percentage of income and G is income Gini.

Following Usman et al. [32], the theil index was also used to measure income inequality. It is important for group decomposition by measuring the deviation from perfect income equality. It is represented as:

$$E(1) = \frac{1}{n}\sum_i \left(\frac{y_i}{y}\right) ln \left(\frac{y_i}{y}\right) \ldots\ldots\ldots\ldots\ldots \text{(2)}$$

where:

E(1) is the theil index, y_i is the income of the individual, y is the mean income, i is the average income, $\sum_i$ is the summation of income, ln is the logarithm of the geometric mean of the ratio, and n is population size.

The regression-based inequality decomposition was used to examine the factors contributing to income inequality following Akin-Olagunju and Omonona [5] and Usman et al. [32]. It is important in explaining the structure and distribution of income. It shows how much individuals/households or groups have a different impact on income inequality [32]. The coefficients obtained from the OLS regression (Equation 3) were used to find the percentage contribution of the variables to the level of inequality (Gini coefficient), also known as the factor inequality weights,Sj (Eq. 4).

The OLS used is explicitly specified as:

$$IN_i = \beta_0 + \beta_1 A + \beta_2 G + \beta_3 E + \beta_4 H + \beta_5 M + \beta_6 D + \varepsilon_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(3)}$$

where:

IN = Rural households' annual income (Naira)

A = Age of rural household heads (years),

G = Gender (dummy: male = 1, female = 0),

E = Education (years),

D = Dependency ratio (number of people depending on household head),

H = Household size (number),

M = Marital status (married = 1, otherwise = 0),

ε_i = Error term.

The factor inequality weights, S_j, is expressed as:

$$S_j = \frac{Cov(\beta_j X_j, InY)}{\sigma(InY)} = \frac{\beta_j * \sigma(X_j) * cor(X_j, InY)}{\sigma(InY)} \ldots \text{(4)}$$

where:

β_j represents the estimated coefficient from the OLS regression of the jth characteristic of an individual, X_j represents the value taken on by the jth characteristic, lnY is the natural logarithm of income, $\sigma(X_j)$and $\sigma(InY)$ are the standard deviations of X_j and of InY, respectively, $cor(X_j, InY)$ is the correlation between factor j and InY. Therefore, $S_j(InY)$ indicates the share of jth characteristic in inequality (Gini index), because X_j is unequally distributed among the households. A positive S_j implies that j is an inequality-increasing factor whereas the negative S_j means that factor j decreases income inequality.

RESULTS AND DISCUSSIONS

The percentage distribution of respondents by household head and marital status

Table 1 shows the percentage distribution of respondents by the household head and marital status. The majority of the households in rural Nigeria were headed by a male, with the highest regional occurrence found in the North West (95.01%) and the lowest in the South-South (71.62). While only 19.18% of rural Nigerian households are headed by a woman, the South East has the highest regional occurrence (36.61%) and the North West has the lowest (4.99%). This result corroborates the findings of Usman et al. [32] that most household heads in rural Nigeria were male. This implies that the males dominated the household heads in rural Nigeria, which might have made them have a say over their female counterparts in decision-making. The majority of the respondents were married (90.5% of the males and 78.9% of the females) and were mostly monogamists. This implies that the rural areas were dominated by married people. Thus, married people have dependants and have the task of providing for their household needs. About 13 per cent of the females were not married and 8 per cent of the males were not married (Table 1). This suggests that single females were more common than single males in rural Nigeria. This could be a result of the larger proportion of females in rural Nigeria. Similarly, widows (7.9%) were more than widowers (0.8%) among the rural population in Nigeria. This could be due to mental and physical stress imposed on the male as the head of the household, which disposed them to illness at an older age.

Table 1. Percentage distribution of respondents by household head and marital status

Variables	Category	North Central	North East	North West	South East	South-South	South West	Total
Gender	Male	81.13	91.08	95.01	63.39	71.62	73.95	80.82
	Female	18.7	8.92	4.99	36.61	28.38	26.05	19.18
Married (Monogamy)	Male	51.6	51.3	44.2	77.3	71.4	62.3	51.9
	Female	54.9	59.6	38	53.7	60.3	53	55.8
Married (Polygamy)	Male	39.9	39.3	45.4	18.3	23.8	29.4	38.6
	Female	26.5	16.7	42.7	26.7	24.4	29.9	23.1
Never married	Male	7.1	8.7	9.6	1.8	2.5	4.9	8
	Female	9.8	18.5	15.7	1.5	3.4	5.4	12.5
Divorced	Male	0.1	0.1	0.1	0.3	0.2	0.6	0.2
	Female	0.2	0.4	0.1	0.3	0.9	0	0.3
Separated	Male	0.3	0.3	0.2	0.7	1.1	1.2	0.5
	Female	0.6	0.1	0.1	0.7	1.1	1.9	0.5
Widow	Male	0.9	0.3	0.5	1.7	1	1.5	0.8
	Female	8.1	4.6	3.4	17.2	9.8	9.7	7.9

Source: Authors' Computation based on GHS (2019) and NCS (1996).

Rural household size and percentage distribution of individuals by age group and gender

Table 2 shows the distribution of average household size and individuals by age group and gender in rural households. The average household size in rural Nigeria was six people. Rural households love to have a larger household size, which serve as cheap farm labour and enhance farm output. This is because large household size contributes significantly to agricultural output in Nigeria. This corroborates Usman et al. [32], who found that the rural households in Nigeria had a larger household size of 6 people on average. The highest household size was recorded in the North East region (8 people), and the lowest was found in the South West (4 people). This could be a result of the practice of polygamous marriage, which was higher in the North East than in the Southwest. The highest dependency ratio was recorded in the North West (1.17), signifying a dependent population higher than the working population, while the lowest was recorded in the South-South region (0.68), which signifies that the working population was higher than the dependent population (Table 2). Rural Nigeria, in general, had a dependency ratio of 0.94, which shows a slightly higher proportion of the working population as against the dependent population.

The working population (age 15–64) represents 51.6% of the rural population, with 24.7% of the 51.6% being males, while the remaining 26.9% were females (Table 2). The dependent population (age 0–14 and 65+) represents 48.4% of the rural population. This suggests a relatively high level of the dependent population, which may reduce the per capita income in the households. Generally, in rural Nigeria, 7.7% of males and

7.2% of females were between 0 to 5 years of age; 6.3% of males and 6.1% of females were between the age group of 6 and 9 years; 7.9% of males and 6.9% of females of the rural population were between 10 and 14 years of age (Table 2). This suggests that a significant proportion (43.1%) of the entire rural population were children (less than 15 years old), while more than half of the population were adults. In total, 50.3% of the rural population were males, while 49.7% were females. Thus, males dominated the rural population in Nigeria.

Table 2. Household size and individual percentage distribution by age group and gender

Age	Category	North Central	North East	North West	South East	South-South	South West	Rural Nigeria	Nigeria
	Average Household size	5.7	7.9	7.4	4.3	4.9	4	5.9	5.5
	Dependency ratio	0.81	0.94	1.17	0.72	0.68	0.78	0.94	0.88
0-5	Male	6.1	8.4	9.9	5.5	5.6	5.8	7.7	7.3
	Female	5.8	7.1	9.4	5.1	5.1	6.3	7.2	6.9
6-9	Male	7.1	7.5	7.6	4.7	4.8	4.8	6.8	6.3
	Female	5.4	6.7	7.6	4.4	5.6	5.3	6.2	6.1
10-14	Male	8.4	8.5	9.4	6.2	6.9	6.6	8.3	7.9
	Female	7.4	7.6	6.9	5.3	7.1	6.5	6.9	6.9
15-64	Male	26.4	25.9	22.5	25.6	29.1	26.6	24.7	25.6
	Female	28.9	25.6	23.5	32.7	30.5	29.5	26.9	27.7
65+	Male	2.5	1.8	2.3	4.7	2.6	4.1	2.9	2.9
	Female	2	1	0.9	5.8	2.9	4.4	2.4	2.5
Total	Male	50.5	52	51.7	46.7	49	47.9	50.3	49.9
	Female	49.5	48	48.3	53.3	51	52.1	49.7	50.1

Source: Authors' Computation based on GHS (2019) and NCS (1996).

Distribution of respondents by education and income

Regarding educational status, the majority (77.80%) of the respondents had 11–16 years of education (Table 3). This implies that the majority had secondary school education, while only 22.20% can be said to have tertiary education. Education plays a vital role in raising rural income, meeting food needs, and addressing sustainable livelihoods [16]. The larger proportion (60.28%) of the rural dwellers sourced their income mainly from agriculture and allied businesses, while the least (8.61%) were salary earners from the private sector.

Table 3. Distribution by Education and Income

Variable	Categories	Frequency	Percentage
Education (years)	6-11	691	22.20
	11-16	2,421	77.80
Source of income	Agriculture and allied activities	1,876	60.28
	Artisans	672	21.59
	Private sector	268	8.61
	Public Sector	296	9.51
Annual income (₦)	≤ 150,000	1,711	54.98
Mean = 505,722.70	150,001 - 750,000	1,236	39.72
Minimum = 13,502.91	750,001 - 1,350,000	85	2.73
Maximum = 5,814,709.21	≥ 1,350,000	80	2.57
Annual per capita income (₦)	≤ 25,000	1,677	53.89
Mean = 85,715.71	25,001 - 125,000	1,267	40.7
Minimum = 4,286.21	125,001-225,000	87	2.80
Maximum = 1,256,014.07	≤ 225,000	81	2.60

Source: Authors' Computation based on GHS (2019) and NCS (1996).

About 22 per cent of the rural dwellers were artisans, and 9.5 per cent were civil servants. This implies that agriculture is a major source of livelihood in rural areas of Nigeria and has contributed significantly to their economic status.

Regarding the annual income in rural Nigeria, the majority (54.98%) of the rural dwellers received an annual income below ₦150,000 (USD 449.10), while the least had an annual income of ₦1,350,000 (USD 4,041.92) and above, as shown in Table 3.

The average annual household income in rural Nigeria was ₦505,722.70 (USD 1,514.14) with a minimum of ₦13,502.91 (USD 40.43) and a maximum of ₦5,814,709.21 (USD 17,409.31). This signifies a wide variation in rural household income. The rural households had an average annual household per capita income of ₦85,715.71 (USD 256.63), which suggests a low annual per capita income in rural Nigeria. The minimum annual per capita income of rural households was ₦4,286.21 (USD 12.83) and a maximum of ₦1,256,014.07 (USD 3,760.52), which also suggests a wide variation in their income.

Income inequality and income shares of rural households before and during the democratic era

Table 4 shows the estimated values of the Theil index and Gini coefficient, which compare the income inequality before and during the democratic era in rural Nigeria. The Gini coefficient of 0.5 implies an extremely high-income inequality among the rural populace in Nigeria before democracy, while 0.44 implies a high inequality during democratic era. Also, the theil index of 0.39 before democracy and 0.32 during democracy showed some level of high-income inequality among rural households. Although these values are still on the high side, there is a tremendous improvement in rural household income inequality as the Gini coefficient and theil index reduced by six per cent and seven per cent, respectively. Thus, both indexes agree that inequality was higher before the democratic era than during the democratic era, which indicates the contribution of democracy to reducing income inequality. The high-income inequality reported in this study corroborates previous findings that rural households, both in developing and developed countries, had a high-income inequality [1, 3, 8, 20, 24, 26, 27, 32].

Table 4. Gini index and theil index before and during the current democratic era

Metrics	Pre democratic era	Democratic era
Gini index	0.50	0.44
Theil index	0.39	0.32

Source: Authors' Computation based on GHS (2019) and NCS (1996).

Table 5. Income shares (%) before and during the current democratic era.

Metrics		**Pre democratic era**		**Democratic era**	
Decile	**Class**	**Decile share**	**Share of classes**	**Decile share**	**Share of classes**
1st decile	Lower Class	1.86		2.76	
2nd decile	Lower Class	2.84		3.90	
3rd decile	Lower Class	3.91	8.61	4.78	11.35
4th decile	Middle Class	5.45		5.72	
5th decile	Middle Class	6.79		6.83	
6th decile	Middle Class	7.51		7.96	
7th decile	Middle Class	9.16	28.91	9.75	30.26
8th decile	Upper Class	12.05		11.76	
9th decile	Upper Class	16.16		15.54	
10th decile	Upper Class	34.27	62.48	31.09	58.39

Source: Authors' Computation based on GHS (2019) and NCS (1996).

Table 5 shows the income shares of rural households before and during the democratic era. Before the democratic era, the lower class (lowest 3 deciles of the population) controlled

8.61% of the total income as opposed to 11.35% during the democratic era; the middle class controlled 28.91% before democracy but has increased to 30.26% during the democratic era; and the upper class controlled 62.48% before democracy as opposed to 58.39% during the democratic era (Table 5).
The nation, therefore, had an expanding middle class during the democratic era.
The reduction in income inequality could be a result of some policies and programmes put in place during the democratic era, such as the National Poverty Eradication Program, the National Economic Empowerment and Development Strategy, and the Presidential Youth Empowerment Scheme. Naseer and Ahmed [20] also reported that income inequality reduced due to government's policies and program.
The decrease in income inequality during the democratic era was also evident by the inward movement of the Lorenz curve towards the line of equality (Figure 2). The pink line in Figure 2 represents the inequality curve of the pre-democratic era, while the blue line represents the inequality line of the current democratic era. Thus, income inequality decreased by 6% between the pre-democratic and democratic eras. These results imply that the democratic era has reduced income inequality in the nation and also increased the share of income of the lower class and middle-class rural households, thereby reducing the high-income share among the upper class.

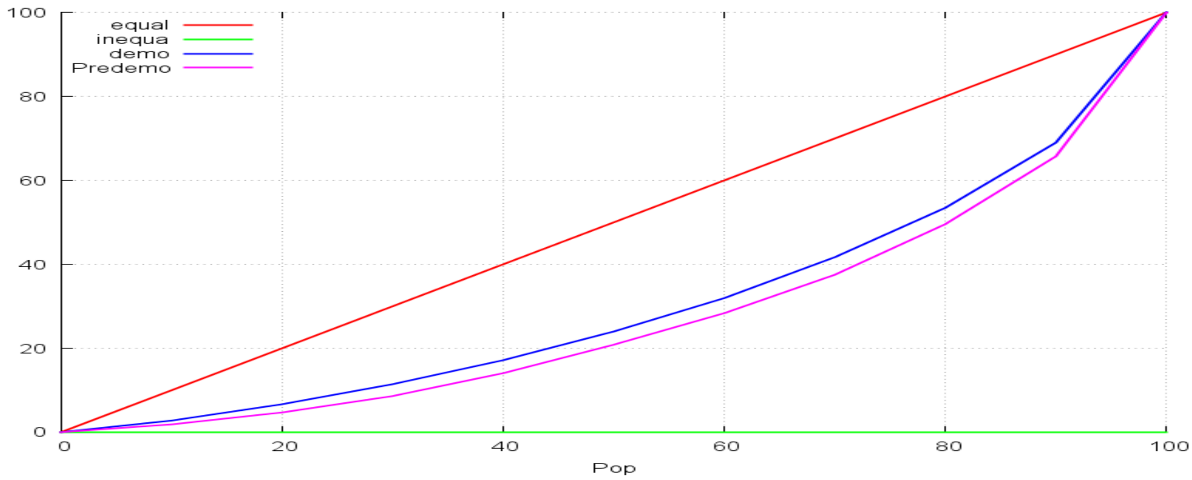


Fig. 2. Lorenz curve for the pre-democratic and democratic era
Source: Authors' Computation based on GHS (2019) and NCS (1996).

Contribution of socioeconomic factors to income inequality

Table 6 shows the outcome of regression-based inequality decomposition, which shows the contribution of socioeconomic factors to income inequality in Nigerian rural households. The result of the coefficient of determinants (R-square) was 0.548, which implies that 54.8% of the variations in income were explained by the independent variables included in the model. Among the socioeconomic factors in the model, the years of education contributed the most to total inequality (23.5%). The dependency ratio had a negative coefficient and contributed -15.3% to income inequality. Household size contributed 6.2% to income inequality, age had a negative coefficient, thereby contributing -0.59% to total inequality, the gender of the household head contributed 0.03% to overall income inequality, and 0.1% of income inequality was contributed by marital status.
Income flow to the household as a result of household head age and dependency ratio (which considers the household size with those within the income-earning range) contributed negatively to income inequality, thereby reducing the income inequality in rural households. Considering their major occupation, farming, which is energy-demanding, farmers' strength, productivity,

and income reduce as their age increases [17]. As a result, income inequality between young and old in rural areas exists.

Years of education was a contributing factor to income inequality. Highly educated people have a higher income than those with no or little education [17, 18]. Due to different educational level in rural households and because 18.1 per cent of the respondents were salary earners, the educational qualifications determined their income and caused disparities in their earnings, which led to income inequality. Similarly, education paves the way for information and adoption of innovation among farmers, therefore, leading to high yield and income among farmers with higher educational status and vice versa [4,10]. This thus led to income disparity among farmers of different levels of educational status. Naseer and Ahmed [20] found a similar result that the level of education contributed to income inequality in Pakistan.

Household size also played a significant role in income inequality. This is because larger household sizes impose a higher responsibility on the household heads, thereby reducing the per capita income in the household. Thus, a lower household size will reduce income inequality in rural areas. This corroborates Akin-Olagunju and Omonona [5] and Usman et al. [32], who reported that household size had a positive effect on income inequality.

Marital status also contributed to income inequality among rural households. Akin-Olagunju and Omonona [5] also reported that marital status contributed to income inequality in Nigeria. A married household head has more responsibilities than a single household head as a married household head has a relatively larger household size, which thus reduces the per capita income in such a household. whereas single household heads have a higher per capita income. This thus caused income inequality among rural households.

The gender of the household head had a positive influence on rural households' income inequality. This suggests that the gender differences in household heads increase income inequality. This could be a result of higher income among male-headed households than female counterpart, thus creating income inequality among them. This corroborates Oyekale et al. [25], Ayinde et al. [7], Naseer and Ahmed [20], and Usman et al. [32], who found that gender had a positive and significant influence on income inequality.

Table 6. Factor inequality weight of the variables for rural households

Variables	Coefficient (β_j)	Standard deviation of X_j	Correlation of (X_j, InInc)	Factor inequality weight of S_j
Age	-0.017	14.536	- 0.024	0.0059
Gender	0.042	0.385	0.047	-0.0003
Years of education	0.344	2.491	0.336	0.235
Dependency ratio	- 0.020	0.986	-0.288	0.153
Household size	0.001	3.225	0.264	0.062
Marital Status	0.013	0.52	0.003	0.001
R^2				0.548

Source: Authors' Computation based on GHS (2019) and NCS (1996).

CONCLUSIONS

With the current democracy, rural households' income inequality has been reduced by 6%, which could be as a result of some policies and programs put in place during the democratic era. This shows some improvement in income distribution and the enjoyment of the governance dividend by the citizens in rural areas of the country. Although income inequality in rural Nigeria is still relatively high, Also, the share of middle population has increased by 1.35% between the pre-democratic era and the democratic era. The electioneering process in democracy has forced politicians, especially lawmakers, to implement agricultural projects such as the distribution of farm inputs in their rural constituencies to garner the votes of the rural electorates. Whether done with good intentions or not, it has helped to reduce income inequality in rural areas when compared to the military regime when people have no say in who their leaders are. Furthermore, the income inequality contributing factors are years of education, household size, gender, marital status, age, and dependency ratio. It is worth noting that among the income inequality contributing factors, years of education contributed the most. The study also found the dependency ratio to have much more of an impact on inequality than household size.

For the government and development partners to achieve more of their aims, especially in reducing income inequality in rural areas, there is a need to gear programmes and policies in the rural areas to boost the education system and empower women so that they can contribute significantly to household income and needs. This can be achieved through the provision of incentives to rural dwellers to pursue education and by giving women access to production resources such as land, farming inputs and credit facilities. Empowering women will go a long way toward reducing income inequality in rural households. Deepening democracy in Nigeria has the potential to further reduce income inequality. Therefore, the government should further strengthen democratic institutions to ensure that the current democratic era yields more benefits to the populace and not truncate it.

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