



Analysis of Households' Income Inequality in Fufore Local Government Area, Adamawa State, Nigeria

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Abstract

The study analysed income inequality among households in Fufore Local Government Area of Adamawa State, Nigeria. Multistage sampling procedure was used to collect primary data from 399 household heads using structured questionnaire. Data collected were analysed using descriptive statistics, Gini coefficient, Lorenz curve and multiple regression analysis. The result revealed that the average age of the respondents was 49.8 years, and predominantly (70.9%) males, 70.7% were married with an average household size of 8 persons. Majority (90%) were farmers with mean farm size of 2.53 hectares. Findings of the study also indicated that 68.4% of the respondents do not have access to any credit facility. The computed Gini coefficient of 0.84 indicates high income inequality in the area. In explaining the factors that affect income distribution among the respondents, nine independent variables were used. Based on the result, income earnings in the study area is positively influenced by all the independent variables except age and household size that showed negative coefficients. The study recommended that agriculture being the main income earning source of the respondents should be made more lucrative through the provision of affordable farm inputs and extension services.

Keywords: Income distribution, inequality, rural, households

JEL Code: 015, D63, 018, H31

Contribution/Originality:

Income inequality is one of the major impediments to socio-economic growth and development in Nigeria particularly in the rural areas where majority of the populace dwell. The situation reflects on the poor and vulnerable condition of the rural people. The Empirical evidence from the current study will serve as a guide for policy and institutional reform geared towards enhancing rural economy

1.0 Introduction

Increasing poverty and income inequality continue to be the most challenging economic trend facing most developing countries over the years, particularly Nigeria. The Nigerian scenario is paradoxical, the country is endowed with enormous resources, however it has majority of its populace living below the poverty line (Oxford Committee for Famine Relief-OXFAM, 2017). A country experiences income inequality when not every member of its population gets exactly the same share of the income the economy is generating (Food and Agriculture Organisation-FAO, 2020). Inequality in income and asset distribution, unequal access to basic infrastructure and services and socio-cultural norms are key drivers of poverty and vulnerability in the country (United Nations Development Programme-UNDP,

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2009). The scale of economic inequality has reached extreme levels, and it finds expression in the daily struggles of the majority of the population in the face of accumulation of obscene amounts of wealth by a small number of individuals. According to National Bureau of Statistics-NBS (2019) 83 million people in Nigeria live below the country's poverty line of 137,430 naira per annum.

According to Dabla-Norris, Kochha, Suphaphiphat, Ricka & Tsounta (2015), greater income inequality reduces economic growth. This suffices that fair income distribution in the economy is a motivating factor for legalisation, effective employment and business activities and consequently for the social and economic development of the state or region (Bilan, Mishchuk, Samoliuk, & Yurchyk (2020). Inequality is the cause and consequence of the failure of the market system as well as the political system, and contributes to the instability of the economic and political systems, which in turn contributes to increased inequality. It is also a cause of entrenched uncertainty and vulnerability (FAO, 2020). Extreme inequality can instigate conflicts, thereby discouraging investments. Conflicts are particularly prevalent in the management of common resources whereby inequality makes resolving disputes more difficult. For example, the unending militancy in Nigeria's Niger Delta region and *Boko Haram* insurgency in the north mirrors the deep wounds of extreme poverty and inequality. In a situation where young and energetic persons suffer social and economic exclusion, they have nothing to lose than unleash terror on the nation (Udoh & Ayara, 2017). This predisposes the eminence of the objectives one and two of the sustainable development goals (SDGs) of reducing poverty and inequality and hunger among the citizenry (Federal Government of Nigeria-FGN, 2016).

As already revealed by some studies across Adamawa State (Girei & Dire, 2014; Tashikalma, Aletogbe, & Michael, 2016), income inequality is on the increase. Adamawa State (an agrarian State in the Northeast) had a negative change in Gini over the years and this has worsened the issue of poverty in the area (Udoh & Ayara, 2017). Fufure is the second largest local government Area in the State. Majority of its residents' dwell in rural areas and are into agriculture and its related activities. As opined by Oyekale, Adeoti and Oyekale (2006); Ayinde, Muchie, Babatunde, Adewumi, Ayinde, & Ibitoye (2012), income inequality and poverty are most prevalent in rural areas, being majorly agrarian with majority of them owing just a small piece of land on which they grow crops which are hardly sufficient to feed themselves let alone to sell in other to generate income. This has placed rural residents in a condition of having dire poverty due to inadequacy of income.

Generally, there is a dearth of information on income inequality across households in Fufure Local Government Area of the State. Hence, considering the prominence of the study area in terms of population, land mass and other economic activities, the study becomes imperative. Understanding income inequality and its consequences on the affected persons is significant for poverty reduction. Therefore, the paper examines income inequality and factors affecting income distributions. The paper is divided into five sections. Section one is introduction, while section two presents the literature review. Section three dwelled on methodological issues while section four presents the results and discussion. Finally, section five concludes the paper and gave policy recommendations.

2.0 Literature Review

2.1 Conceptual Review

Inequality is termed as the state of not being equal, especially in status, rights, and opportunities. This concept is very much at the heart of the social justice theories (United Nations-UN, 2015). Income inequality is defined as an extreme disparity of income distribution with a high concentration of income usually in the hands of a small percentage of the population (Kopp, 2019). Development

theory has largely been concerned with inequality in standard of living such as inequalities in income/wealth, education, health and nutrition. Inequality in income distribution comes in various forms. The economic literature considers such differences in economic system (Alvaredo, Chancel, Piketty, Saez, & Zucman, 2018), differences between knowledge and skills, wage levels in the sectors of economic activities and age among individuals (Duc, Hong Vo, Nguyen, Tran & Vo, 2019). However, the relative importance of each factor depends on how and over what time period inequality is measured (Congressional Research Services, 2021). Income inequality can be analysed through a variety of segmentations such as occupation, historical income, gender, ethnicity and geographical location.

2.2 Empirical Review

Several tools such as Granger Causality, Inequality Index, Gini Coefficient and Lorenz Curve can be used to measure income inequality. For instance, Ogbeide & Agu (2015) in their study on poverty and income inequality in Nigeria used Granger Causality approach and found that there is a two-way causality flow between inequality and poverty in Nigeria. Similarly, another study on income inequality and poverty among farming households in south west Nigeria by Akinlade, Adejolu & Carim-Sanni (2015), found that farmers income level was higher during the rainy season than dry season, while income inequality was higher during dry season compares with rainy season. In another study by Brown & Ogbonna (2018), they examined the relationship between income and poverty in Nigeria within a period spanning 1980-2017. The study employed the Error Corrective Model (ECM) and the Granger Causality techniques using the variables of inequality, poverty, unemployment and life expectancy at birth. Their findings revealed that national poverty index increased inequality but was however statistically insignificant.

In another study by Lucky & Achiebelema (2018) where they examined poverty and income inequality in Nigeria using National Bureau of Statistics 2010 survey, in which case food poverty line, absolute poverty line, subjective poverty measure and the dollar per day poverty line were used to measure poverty and while Gini coefficient was used to measure income inequality. Their findings revealed that significant proportions of Nigeria population are living below poverty line, and that there is a gap between the rich and the poor in Nigeria.

In the same vein Nwosu (2019), examined the relationship between income inequality and economic growth in Nigeria and its implication for economic development. The study covered the period of 1981-2017 and employed the autoregressive distributed lag estimation technique. The result showed that economic growth had positive but significant impact on income inequality in Nigeria. In more recent study on income inequality and poverty in Nigeria by Taiga & Ibrahim (2020), the findings revealed that income inequality significantly contributed to the rising poverty in Nigeria, increasing poverty by 75%.

3.0 Methodology

3.1 Study Area

The study was conducted in Fufore Local Government Areas (LGA) of Adamawa State (Figure 1). Fufore is situated South-East of Girei, and lies between latitude 9°13' North and longitude 12°39' East (Adebayo, Tukur & Zemba, 2020). The LGA shares boundary with Jada LGA in the South, Mayo-Belwa LGA in the South-West, Yola





South LGA in the West, Girei LGA in the North-West, Song LGA in the North, Maiha LGA in the North-East and Cameroun Republic in the East. The Local Government has a land mass of 4,972 km², making it the second largest LGA in the State. It has a population density of 56.30/ km². Fufore is predominantly rural, ethnically diverse and physically dissected (having substantial land mass on both sides of rivers Benue and Ine). The major occupation of the people is farming (which include: crop production, livestock husbandry, vegetables/irrigation farming and fishing). Crops such as maize, sorghum, millet groundnuts, bambara groundnut, cowpea, root and tuber crops, and tree crops are grown in the area. Livestock such as cattle, sheep and goats, and poultry are produced in the area. Local trading such as crop processing, cattle and small ruminants fattening and trading to a lesser extent also form part of their occupation. The major tribes in the LGA includes: Fulani, Batta, Hausa and Verre, while Chamba, Kanuri, Laka are among few others. Fulfulde (Fulani language) is the most widely spoken language followed by Hausa.

3.2 Sample Data Collection

The study population of the survey was the household heads in Fufore Local Government Area of Adamawa State. The Local Government has an estimated population of 304,964 in 2019 (NBS, 2019). Primary data was used for the study, and were collected through the administration of questionnaires to the respondents. The study used 399 out of 102,355 households from the sampled communities in the study area as sample size. Three reasons informed the decision; first the researcher is constrained by time frame and finance at the time of the study; secondly, 10-15% of any population is considered as a good representative for any judgment in social sciences (Smith, 2015). Thirdly, a sample of 399 can fit well in the selected analytical tools for the study (Eboh, 2009).

The multi-stage random sampling procedure was used in selecting respondents for the research. In the first stage of sampling, three out of the seven districts of the Local Government Area were randomly selected. In the second stage, twelve communities were selected at random from the selected districts. In the third stage, 399 respondents were selected from all the communities selected proportionate to the size of each of the community. The sample size was guided by the Yamene (1967) formula. The formula is presented thus;

$$n = \frac{N}{1 + N(e)^2} \quad (1.1)$$

Where: n = sample size

N = Total number of populations under study

e = signifies the margin error at (0.05 %)

1 = constant

Therefore, based on the above formula, the sample of this study is calculated as follows:

$$n = \frac{279,900}{1 + 279,900(0.05)^2}$$

$N = 399$

3.3 Methods of Data Analysis

Gini coefficient and Lorenz curve were used to assess income inequality in the study area. The Gini-coefficient is a measure of statistical dispersion most prominently used as a measure to show the degree of income distribution or inequality of wealth distribution between different households in a population. It measures the extent to which household or individual's income in a country deviates from perfectly equal distribution (United Nations University, 2017). According to Ayinde *et al.* (2012), Gini-coefficient is defined as a ratio with values between zero and one (0-1). A low Gini-coefficient indicates more equal income or wealth distribution, while a high Gini-coefficient indicates more unequal distribution. Zero (0) corresponds to perfect equality while one (1) corresponds to perfect inequality. The Gini coefficient was computed as:

$$G = 1 - \sum XY \quad (1.2)$$

Where;

G = Gini coefficient,

$\sum$ = Summation sign,

X = Percentage of household heads

Y = Cumulative percentage of household income.

The Lorenz Curve of various incomes of the respondents with their population was plotted. Income inequality is worked out by measuring the ratio of the area between the Lorenz curve and the 45-degree line to the whole area below the 45-degree line. If the Lorenz curve is the 45-degree line, then the value of the Gini-coefficient would be zero. In general, the closer the Lorenz curve is to the line of perfect equality, the less the inequality and the smaller the Gini-coefficient. Where it shows for the horizontal; X- cumulative proportion of household and for the vertical; Y-cumulative proportion of income. that is:

$$Y \text{ against } X \quad (1.3)$$

Where;

Y = Cumulative Proportion of household income

X = Cumulative proportion of the households.

Multiple regression analysis was used to identify factors that affect income distribution in the area. The equation is mathematically presented as follows;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \mu \quad (1.4)$$

Where;

Y = Annual income (amount)

β_0 = Constant

X_1 = Age (years)



X_2 = Gender (male=1, female=0)

X_3 = Household size (number of people)

X_4 = Educational qualification (years spent in school)

X_5 = Income earning sources (number of livelihood activities)

X_6 = Primary occupation (farm=1, non-farm=0)

X_7 = Membership of social group (member=1, non-member=0)

X_8 = Access to credit (yes=1, no =0)

X_9 = Farm size (hectares)

4.0 Result and Discussion

4.1 Income Inequality

Income inequality is a problem affecting every nation of the world and they are parts of the greatest challenges facing mankind today (Akinlade, Adeyonu & Carim-Sanni, 2015). The analysis of household monthly income was computed using the Gini coefficient as presented Table 1. The result revealed that 59% of the respondents earned 16% of the total monthly income while 6% earned 43% of the total income generated. This presents a clear indication of income inequality among the respondents. Under normal distribution of income, each household supposed to earns ₦39,865 per month. Hence, the computed Gini coefficient of 0.84 it indicates high income inequality in the distribution of income in the study area.

This finding is in line with the views of Hellebrandt & Paolo (2015) who revealed that, despite the unprecedented economic growth in recent years, global income inequality is probably greater than it has ever been in human history. The Lorenz Curve in Figure 2 also buttresses the fact that there is high income inequality in the study area. This result is in line with a study conducted by OXFAM (2017) which indicated that the gap between the rich and the poor may be a worldwide problem, but in Nigeria the scale of inequality is extreme. It should be noted that high level of income inequality produces an unfavourable environment for economic growth and development (British Council, 2012).

Table 1: Households Income Inequality among the Respondents

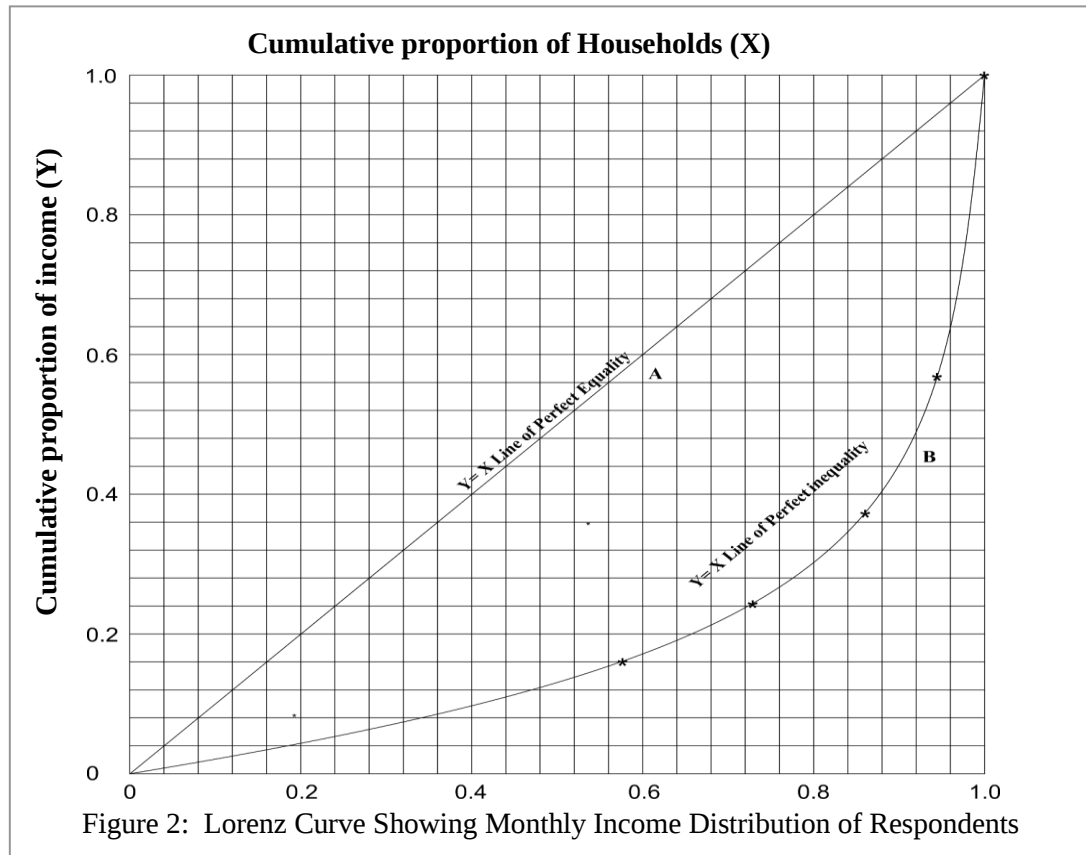
Amount (₦)	Frequenc y	%	Proportion of Population (X)	Total Monthly Income (₦)	% of Total Monthly Income	Proportion of total income (Y)	$\sum XY$
<40000	237	59.4	0.59	1,631,700	15.82	0.16	0.09
40000-79999	66	16.5	0.17	817, 500	7.92	0.08	0.01
80000-119999	43	10.8	0.11	1, 370, 250	13.28	0.13	0.01
120000-159999	29	7.3	0.07	2,046, 000	19.83	0.20	0.01
≥160000	24	6.0	0.06	4, 450, 650	43.14	0.43	0.03
Total	399	100.0	1.00	10316100	100	1.00	0.16
Mean 38,925							

Source: Field Survey, 2019

Gini coefficient (GC) = $1 - \sum XY$

$$= 1 - 0.16 = 0.84$$

$$GC = 0.84$$



4.2 Factors Affecting Income Distribution among the Respondents

The study used multiple regression analysis to identify factors affecting income distribution among the respondents. Based on the result presented in Table 2 the independent variables used were able to explain 60.69% of the variability in income distribution among the respondents. Similarly, the model used had a good fit on the overall considering, the fact that the F-value was 66.56 and was statistically significant at 1% (p-value =0.0000). The model met the selection criteria of statistical, economic and econometrics. In explaining the factors that affect income distribution among the respondents, nine independent variables were used, namely; age (X_1), sex (X_2), household size (X_3), education (X_4), income earning sources (X_5), primary occupation (X_6), Membership of social group (X_7), access to credit (X_8), and farm size (X_9). Based on the result, income earnings in the study area is positively influence by all the independent variables except age and household size that showed negative coefficients.

The result indicated that age of the household head (X_1) has a negatively significant (at 1%) relationship with income earning. This implies that the likelihood of earning higher income decreases with advancement in age and vice versa. This could be attributed to the fact that older household heads tend to earn less compared to younger household heads that may be more active economically with less social burden. Similarly, findings of this study revealed that sex (X_2) of the respondent influences income earning capacity. The result showed that the possibility of earning high income increases with being a male compared with being a female. This is because for certain cultural and religious reasons, persons of the male gender tend to have higher access to most economic resources compared to their female counterparts. Also, household size (X_3) was significant at 1% and has a



negative relationship with the probability of earning higher income in the study area. This is because an increase in family size would increase household consumption which will in turn affect the ability of the respondents to invest in other income earning ventures (Awoyemi, 2005). The study also showed that coefficient of years of formal education (X_4) was statistically significant at 1% level and has a positive relationship with the likelihood of earning higher income in the study area. This suggests that, increase in years of formal education increases the likelihood of households having multiple streams of income and vice versa. This is as expected, since the level of education should positively affect the income earning capacity and level of efficiency in managing the household's resources. This finding lends credence to the submission of Michael, Lumbonyi, Abdullahi, Olayiwola, Yaduma & Abdullahi (2016), who revealed that education enhances income earning capacity of people.

The study also revealed that income earning sources (X_5) has a positive and statistically significant (1%) relationship with income earning. This implies that, an increase in the number of income earning sources will increase the possibility of a household to earn more income and vice versa. This is due to the fact that increased income earning sources diversifies the income sources and reduces vulnerability to stress and shocks. In the same vein, the respondents' primary occupation (X_6) shows a statistically significant (positively) relationship with having higher income. In the study, access to credit (X_7) showed a positive and statistically significant (at 1%) relationship with increased income earnings. This signifies that for any rise in the amount of credit, the probability of earning higher income increases.

This is due to the fact that credit contributes to household income and can be invested in other economic ventures that can likely bring more funds to the respondents. Further, the study showed that membership of a group (e.g. cooperatives) (X_8) has a positive and statistically significant (at 1%) relationship with higher income earning capacity. This is because membership of such group enhances people's access to productive resources that can lead to higher income in the area and vice versa.

Also, the coefficient of farm size (X_9) was positive and statistically significant at 1% level. This means that as a household's farm size increases, the probability of earning higher income tends to increase. Specifically, households with larger farm sizes tend to earn more income compared to those with smaller sizes. This can be attributed to the greater efficiencies in the use of resources associated with the large farms than those with small farms. As a consequence, small farm holdings may result in low productivity and low income.

Table 2: Factors Affecting Income Distribution among the Respondents

Variable	Coefficient	Std. Error	t-statistics
Age(X_1)	-262.6516	101.5835	-2.585574***
Gender(X_2)	5220.984	2280.999	2.288902**
Household size (X_3)	-374.8170	214.5374	-1.747094*
Educational Level (X_4)	776.2591	221.2280	3.508865***
Income earning sources (X_5)	6976.774	884.7697	7.885413***



Primary occupation (X ₆)	9078.432	2257.248	4.021903***
Membership of social group (X ₇)	11882.00	2438.691	4.872284***
Access to Credit (X ₈)	18964.15	2746.260	6.905444***
Farm size (X ₉)	4598.220	762.5955	6.029698***
Constant	13266.12	6858.743	1.934191
R-squared	0.606927		
Adjusted R-squared	0.597809		
S.E. of regression	18482.70		
F-statistic	66.56598***		

Source: Field Survey, 2019

***, **, * Significant at 1, 5 and 10%, respectively

5.0 Conclusion and Policy Recommendations

Income inequality has remained a major source of concern to many developing nations. The analysis and findings in this study have shown that majority of the respondents undertake farming as their main sources of income. However, there is a very high incidence of income inequality in the area (0.84). The high incidence of income inequality has its attendant consequences on the people's economic, social, cultural and political wellbeing. Income inequality exacerbates poverty, which happens to be foremost among the country's developmental challenges.

The preceding analysis has brought out some findings that have important implication on policy formulation. Based on these findings, the following recommendations are proffered towards reducing income inequality in the study area:

- i. Agriculture being the main income earning source of the respondents should be made more lucrative through the provision of affordable farm inputs and extension services. This will go a long way in expanding the farm venture and enhancing the income of the respondents.
- ii. Residents of the area should be encouraged to form cooperative societies. This will assist the people in having wider social assets and accesses to resources that can enable them earn more income.
- iii. Financial institutions should be encouraged to make access to loans affordable for rural residents, this will enable the people invest into other income earning ventures that will lead to higher returns.
- iv. Agricultural extension service providers should integrate the promotion of diverse livelihood income activities into their extension messages. This can help to improve farmers' capacity to diverse their livelihood sources and to cope with any shock or stress such as food shortage which can lead to poverty.

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