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Income Inequality and the Welfare of Rural Households in Imo State, Nigeria

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Abstract: The study was undertaken to examine the impact income inequality has on the well being of rural households in Imo State. Multistage sampling technique was used in the selection of 200 household heads. Structured interview schedule was developed to obtain information from the respondents. The data collected were analyzed using descriptive statistics, Gini coefficient based decomposition, Sen's Welfare Index and Spearman's Rank Correlation and the Coping Strategies Use Index (CSUI). The findings shows that the average age of the household heads in the study area was 51 years with farming as major occupation. Indicators of well being used were: housing type, housing material, source of drinking water, health facility, lighting source and type of cooking materials. Results revealed that there was a low level of well being of households from the welfare indicators considered. The income inequality as reflected by the Gini coefficient (0.47) shows a moderately high level of inequality in income of the respondents. Income inequality is negatively correlated with welfare indicators. This implies that income inequality impacts negatively on the well being of members of the households.

Key words: Income inequality, welfare indicators, Gini coefficient, CSUI, Imo State, Nigeria

INTRODUCTION

World income distribution is doubtedly unequal between nations and people and this has resulted into broad North-South divisions of rich and poor countries. Based on this, the countries of the world can be grouped into three classes namely; low-income, middle-income and high-income countries. The middle income and low-income countries are mostly referred to as developing countries and the high-income countries as developed countries. Hence, a great disparity exists between income of the developed and developing countries.

This incidence of income inequality has been attributed to several reasons. These include the fact that developed countries have more access to technology and capital yielding asset than developing countries. Also, the fact that there are income transfer mechanisms such as progressive taxation, social security schemes and direct public expenditure installed in the developed society and hence accounting for the low level of income inequality.

In the developing countries, great differences exist between income in rural and urban areas. This can be attributed to the fact that urban dwellers have a higher literacy level (thus can engage in salary paying jobs or occupations), more access to basic infrastructures (motorable roads, portable water, electricity, health services) than those in rural areas.

A number of studies have tried to pinpoint the detrimental effects of income inequality on the economy. Aboyade (1974), worked on the 1966/67 household sample survey of 1,636 households covering wage earners, the self-employed and farmers in the whole country except the eastern region, cut off by the civil war. He estimated the Gini coefficient to be 0.58, which specifies a high level of inequality in income. Matlon (1979) in a survey of income distribution in rural Northern Nigeria, conducted a sample survey of three villages covering 135 households and estimated the Gini coefficient to be 0.316. Oyekale *et al.* (2006), compared rural and urban household in Nigeria and posited that as at 2004, income inequality is higher in rural areas than urban. Evidently, income inequality is higher in the rural areas than in the urban areas. This situation has been a persistent phenomenon in Nigeria.

Adams and Jane (1995), proved in their various studies that income inequality is closely related to poverty. Again, low absolute levels of income arising from income inequality can have serious consequences on the nutrition and health of individuals (welfare). The costs of treating various forms of malnutrition are trivial relative to the tangible damage done; therefore, prevention of the problem from occurring is beneficial to the welfare of the economy as a whole.

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Previous studies have shown that low income can lead to malnutrition, which prevents efficient working and healthy living (Felipe, 2003; Oluwatayo, 2008). This study examined the nature, extent and impact of income inequality on the well being of rural households in Imo State. It is being hypothesized that income inequality has no significant influence on the well being of household in the study area.

MATERIALS AND METHODS

Study area and data collection: This study was carried out in Imo State, Nigeria. Imo State is one of the states constituting the southeastern region of Nigeria. According to 2006 population figures, 3,934,899 persons resides in the state with 2,032,286 males and 1,902,613 females, giving a sex ratio of 106.8. The state was created in 1976 and was split off in 1991 as Abia and Ebonyi States. It is located between longitudes 6°50'-7°21' East of Greenwich Meridian and latitudes 4°45'-7°15' North of equator. It is bordered by Anambra State to the North, Abia State to the East and Rivers State to the South and West. Imo State has 27 local government areas and 3 Agricultural Development Project Zones. Imo State covers a total land area of 5,530.00 km^2. It has a population density that varies from 230 persons km^{-2}; it occupies the lower River Niger and the upper and middle Imo river. The state consists of coastal lowlands to the East of Niger River and most of the State is made up of original tropical rainforest vegetation. The major ethnic groups in the state are the Ibos. Although, some parts of the region are fairly urbanized, the greater majority of the population still lives in rural areas; the study was concentrated on the rural part of the state and data on socioeconomic characteristics of households, consumption, various income sources and welfare coping strategies was obtained from 200 respondents among the groups of residents in the study area, which were randomly sampled and interviewed with well structured questionnaires.

Sampling technique: A multistage random sampling technique was adopted: the first stage involved identifying the three agricultural zones in the state; the second stage was followed by delineation of the three zones into communities. The third stage was the selection of 10 communities and finally respondents were selected proportionate to size on the basis of the population of each zone to make it representative. Households in the delineated zones were randomly selected and a total number of 200 questionnaires were distributed to the members of these households.

The various economic activities from which respondents were selected included farming, trading, civil service, teaching, private entrepreneurs just to mention a few in Table 1.

Methods of data analysis: A number of statistical tools were employed in this study in order to address the stated objectives. The tools include: Descriptive statistics, Gini coefficient based decomposition, Sen's welfare Index and Spearman's rank correlation.

- Descriptive statistics such as frequency distribution tables and measures of central tendency was employed to determine the socioeconomic characteristics and sources of income of respondents
- Gini coefficient based decomposition was employed to determine the extent of inequality in income in the study area

This is given by:

$$G = \frac{2}{n\mu} C_{ov}(y,r)$$

Where,

G = The total income
n = The number of observations
y = The series of total income
r = The series of corresponding ranks

The Gini coefficient of each (ith) source of income can be shown as:

$$G_i = \frac{2}{n_{\mu i}} C_{ov}(y_i r_i)$$

y_i and r_i refer to the series of income from ith source and corresponding ranks, respectively.

The total income Gini coefficient can be expressed as a function of the Gini, since it is the combination of source incomes. It is given as:

$$G_i = \sum_{\mu i/\mu} = R_i G$$

Where,

R_i = The correlation ratio expressed as:

$$R_i = \sum_{\mu i/\mu} (y_i r)/(y_i, r_i)$$

Co_v (y_i, r_i) gives the covariance of the ith source of income and corresponding rank. Co_v (y_i, r_i) gives the covariance of total income and corresponding rank.

Table 1: Distribution of respondents by agricultural zones

Agricultural zones	Frequency of respondents
Okigwe	65
Orlu	65
Owerri	70
Total	200

Field survey (2006)

From above equations, Gini coefficient based decomposition can be expressed as follows:

$$\sum_{wigi} = 1$$

$$w_i = \mu_i / \mu$$

$$g_i = R_i G_i / G$$

Where,

Σ_{wigi} = The factor income inequality weight of the ith source of overall income inequality

g_i = The relative concentration coefficient of the ith source in overall income inequality

w_i = The source income weight

Sen's welfare index and Spearman's rank correlation: Correlation analysis was employed to analyze the impact of income inequality on the well being of households in the study area.

Sen's welfare index is an important measure of well-being. It requires data on mean household income and the Gini coefficient.

Sen's Welfare Index (W) is calculated;

$$W = \alpha (1 - G)$$

Where,

α = Mean household income

G = Gini coefficient of overall income inequality

Spearman's rank correlation was used to determine the co-variation between the welfare index and the income distribution variables.

This is given as;

$$P = 1 - \frac{6\sum \delta_i}{N(n^2-1)}$$

Where,

δ_i = Difference between each rank of corresponding values of X and Y

n = The number of pairs of values

RESULTS AND DISCUSSION

About 77.5% of the respondents had family size of 4-7, while only 15% had family size of 8-11. The average household size was 6 persons. This result indicates that the household size in the area is moderate. Previous researches confirmed that household size has significant effect on income generation. It was observed that inhabitants preferred large family size and this is a characteristic of farming communities as the large size is used as family labour on the farms (Akinbile, 2002).

Majority of the respondents had formal education, while very few had informal education. This has the tendency of affecting the level of adoption of improved farm practices, as previous studies have shown a relationship between farmers' level of education and their level of adoption (Fawole and Fasina, 2005).

Income sources and level of inequality among respondents: The main source of income of the household is agriculture (44%) as revealed in Table 2 and there is relatively low incidence of specialized skills, which will earn them extra income from other lucrative jobs which could give them high income. Results in Table 3 shows that the mean income of respondents in the study area was ₦108,711.8. About 24% of the respondents were in the lowest income group, while only 2.5% were in the highest income group. A greater majority made up the moderately, low income group.

Table 2 shows that 44% of the respondents earn their income from agriculture those, who earned income from non-farm sources constituted 27% of the respondents. This is followed by livestock, transfer and rental sources, which were 16, 8.5 and 4.5%, respectively.

The distribution indicates that the major sources of income in this study area were agriculture and non-farm sources.

Results of the study shown that a Gini coefficient for overall income of households in the study area was computed as 0.47. This indicated a moderately high inequality in income among the households. This conforms to other studies showing that a few portion of the population had the greater share of income. (Aboyade, 1974; Adams and Jane, 1995). Table 4 revealed the computed Gini coefficient of the 10 communities surveyed in order to compare the level of income inequality among the different communities.

It was observed that there was a general low Gini coefficients in all the communities surveyed, but the communities nearer to the urban areas recorded higher level of income inequality than those in the core remote areas. These general low inequalities in income might be due to similar socio-economic characteristics of the households.

Table 5 shows that transfer income has the greatest income source inequality shown by the Gini coefficients, indicating that transfer income is the most unequally income increasing source.

However, agricultural income had the greatest source income weight and therefore, made the largest contribution to total income accounting for 68% of total income. Rental income contributes the least, accounting for 0.45% of total income.

Income inequality and welfare of respondents: Results shown that welfare index was calculated for each of the 10 communities surveyed, with their corresponding mean household incomes and Gini coefficients. Then the Spearman's rank correlation was used to determine the co-variation between the welfare index, mean income and the Gini coefficient (measure income inequality).

Table 6 shows that the welfare index for all the communities had positive coefficients. Consequently, research shown that for all welfare measures a positive coefficient implies that an increase in the corresponding variables reduces welfare, while a negative coefficient indicates that the variables had an equalizing effect. This implies that as Gini coefficient (a measure of income inequality) increases, welfare decreases.

Table 7 reveals that Gini coefficient (measure of income inequality) negatively correlates with welfare. This implies that an increase in the levels of income inequality leads to low levels of welfare.

Table 2: Distribution of respondents according to their household income sources

Income sources	Frequency	Percentage
Agriculture	88	44.0
Livestock	32	16.0
Non-farm	54	27.0
Transfer	17	8.5
Rental	9	4.5
Total	200	100.0

Table 3: Distribution of households according to level of income (n = 200)

Total income (₦)	Frequency	Percentage
<50,000	48	24.0
50,000<100,000	83	41.5
100,000<150,000	34	17.0
150,000<200,000	10	5.0
200,000<250,000	5	2.5
250,000<300,000	5	2.5
300,000<350,000	3	1.5
350,000<400,000	7	3.5
400,000 and above	5	2.5
Total	200	100.0

Table 4: Communities and their corresponding Gini coefficients

Communities	Gini coefficient
Ihiagwa	0.160
Eziobodo	0.356
Ogbe	0.341
Oru	0.192
Ihitte uboma	0.161
Umuokirika	0.200
Lude	0.218
Nguru	0.229
Otulu	0.104
Obowo	0.390

Table 5: Decomposition of overall income inequality using the Gini coefficient

Measure/income source	Gini coefficient
Gini coefficient of overall income	0.47
Gini coefficient of source incomes	0.28
Agriculture	0.45
Livestock	0.37
Non-farm	0.25
Transfer	0.57
Rental	
Source income Weight (W_i)	
Agriculture	0.68
Livestock	0.10
Non-farm	0.20
Transfer	6.9×10^{-3}
Rental	4.5×10^{-3}

Field survey (2006)

Ranking of coping strategies based on frequency of use: In ranking the coping strategies used in the study area, a number of strategies (formal and informal) were considered based on the responses from the sampled households (Table 8).

Generally, about twelve different coping strategies were very conspicuous in their responses. The study reveals that fetching of firewood, an informal coping strategy is the most widely used coping strategy in the study area. This was closely followed by cutting down expenditure on food and non-food items and income diversification, respectively.

The respective percentages of households using these strategies are 20.17, 17.71 and 14.51%. However, the most widely used of the formal coping strategies was borrowing from banks/cooperatives (3.11%). The least used of all the formal strategies was the National Poverty Alleviation Programme (NAPEP) (0.56%) indicating that <1% of the households use this strategy.

Table 6: Welfare index for the surveyed communities

Community	Mean income	Gini coefficient	Welfare index
Ihiagwa	154,315.60	0.160	128945.00
Eziobodo	163870.00	0.090	141909.20
Ogbe	148140.60	0.340	97541.00
Oru	164350.00	0.190	132722.30
Ihitte Uboma	173820.00	0.060	163123.10
Umuokirika	170190.00	0.200	136086.50
Lude	149370.60	0.130	130173.50
Nguru	151740.60	0.230	116897.20
Otulu	164820.00	0.105	147591.40
Obowo	146490.60	0.390	89309.02

Field survey (2006)

Table 7: Correlation of Sen's Welfare index (W) with mean household income (α) and the Gini coefficient (G) using Spearman's rank correlation

Variables	Mean income	Gini coefficient	Welfare index
Mean income			
Correlation	1.000 (0.00)	-661 (0.38)*	879 (0.001)**
coefficient	-	-	-
Gini coefficient			
Correlation	-661 (0.38)*	1.000 (0.00)	-891 (0.00)*
coefficient	-	-	-
Welfare index			
Correlation	0.0 (0.001)	-891 (0.001)**	1.000 (0.001)
coefficient	-	-	-

Computer print- out of data analysis, 2006; Correlation is significant at 0.05 level (1-tailed); ** Correlation is significant at 0.01 level (2-tailed)

Table 8: Coping strategies based on frequency of use (CSUI)

Coping strategies	N_3 $F(X_3)$	N_2 $F(X_2)$	N_1 $F(X_1)$	N_0 $F(X_4)$	CSUI	Households (%)	Rank
Income diversification	49	54	58	20	313	14.51	3
Cutting down expenditure	79	49	49	5	382	17.71	2
Borrowing from friends/relatives	21	28	28	92	171	7.93	6
Fetching of firewood	108	15	15	10	435	20.17	1
Withdrawing from savings	-	54	54	82	144	6.68	7
Withdrawing children from schools	8	17	17	133	87	4.03	8
Selling assets	4	18	18	155	30	1.39	10
Engage in paid job as laborer	41	35	35	81	206	9.55	5
Reducing the quantity of food taken	60	63	63	30	289	13.40	4
Migration to urban centers in search of jobs	4	9	9	168	21	0.97	11
Borrowing from banks and cooperatives	5	18	18	141	67	3.11	9
NAPEP	-	4	4	156	12	0.56	12

Field survey (2006); CSUI = $N_1 F(X_1)+N_2 F(X_2)+N_3 F(X_3)+N_0 F(X_4)$; N = Weight attached to each coping strategy; F(X) = Number of households using each coping strategy

CONCLUSION

The study has its focus on welfare status and income inequality in the rural areas of Imo State. It was shown that the level of welfare in the area was low as depicted by the welfare index calculated in terms of the positive values it gave. Level of income inequality, which was moderately high in the areas, was seen to have a negative impact on the welfare status in the area. It was concluded that as the level of income inequality increases, the well-being of the people would be enormously affected. The study hence concluded that reducing the level of income inequality to improve the welfare status of people in the area calls for an integrated approach, which focuses globally on the livelihood and the entire ways of living of the rural people.

Based on the findings of this study, recommendations such as investing more in education to increase and enhance the potential of household adopting agricultural technology, as a way of increasing the productivity and consequently, the income of farmers derivable from this source. The government should make policies that will be aimed at ensuring the even distribution of income to check the overall level of income inequality. Furthermore, there should be development of a functional and efficient food marketing system that would encourage agricultural production and commercialization. These will help to combat abject poverty and improve the standard of living of the rural people.

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