

**INCOME DISTRIBUTION AMONG RURAL FARMERS IN IMO STATE, SOUTH EAST,  
NIGERIA.**

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### ABSTRACT

The paper investigated how income was earned and distributed among the selected rural farmers in Imo State of Nigeria. It further compared the income of the rural farmers and those of the civil service. Using cross sectional design, a total of 100 rural farmers were randomly selected in the study, which was carried out in the Year 2011. Use was made of Gini Coefficient, Slope Index and Multiple Regression tools in the analyses. The paper asserted the existence of income inequality and the extensive use of family labor/resources among the selected farmers. The resulting Lorenz Curve depicted the existence of inequality; and the Gini and Slope Indices of 0.460 each and Kuznet index of 0.50 confirmed this. The paper further revealed that the lowest paid civil servant earned 2.27 times more income than the average rural farmer while the figure for the highest paid civil servant was 25 times higher than the average farmer. Level of technology, farm size, loan size and incidence of pests and diseases were among the factors affecting the level of the farmers' income. The study therefore affirmed that this picture portended great danger in respect to food security, raw material production and its concomitant macro economic problems, notably inflation, unemployment and urban congestion. It further noted that it was vitally important to enhance the income status of rural farmers through the use of subsidies, financial leverages, intensive educational technology and use of improved varieties and cultural practices in the farming system.

**Keywords:** Income Distribution of Rural Farmers Imo State

### INTRODUCTION

Income is the reward for the use of labor, management, capital and land. According to Blanchard, O (1997), it is what you earn from working or from rental income or from interest and dividends. Household or family income is the stream of resources including: money, goods, services and satisfactions that come under the control of the family to be used by them to satisfy needs and desires and to discharge obligations (Nickel & Dorsey, 1976). Income distribution therefore relates to how these resources are shared between individuals, occupations, and various income groups and classes in a society within a given period of time.

#### Income can be grouped into:

- Money income –which is the purchasing power in Dollars or Naira and Kobo {Nigerian currency} that goes into the

family treasury in a given period of time, say monthly,

- Real Income- is income in kind and is the flow of goods and services used or available for any given period of time. In purely economic sense, it is income in terms of goods and services it will buy.
- Psychic Income- is that flow of satisfaction that arises out of our everyday experiences, derived largely from the use of money, real income and other types of income and making for psychic and physical well-being.
- Other types of income include:
  - + Unrealized income-for example capital gains, and
  - + Income from non-farm source-for example gifts, pensions subsidies.

The need for the study has become imperative to determine how income is distributed between rural small-scale farmers and the other occupations in the country. This is to x-ray how national policies are skewed in relation to these farmers who produce the bulk of food and raw materials consumed locally and for exports.

Many authorities are of the view that the rural farmers receive an “unfair” share of the national wealth and therefore belong to the low income earners. This agrees with the World Bank (1996) report which asserts that about 43% of the Nigerian population was living below the poverty line of US Dollars 345 a year in 1985 prices. In 1988, Nigeria's GNP per capital fell to USD 290, which relegated the nation to low income status below India, Pakistan and Ghana (<http://countrystudies.us/nigeria/55.htm>). According to the United Nations Development Programme (UNDP) Human Development Index (HDI) Report (2001) the percentage of Nigerians falling below the US Dollar 1.00 per day poverty line is 70.2%. For a country with an estimated population of 124 million people, it implies that over 90.28 million Nigerians are poor. The UNDP HDI Report (2004) shows that, Nigeria was ranked 151 out of 175 countries and therefore falls within the low human development group; notwithstanding that she earns about 18 billion US Dollars per year from crude oil sales alone. Over 60% of Nigerians live in rural areas, which are characterized with inadequate infrastructural facilities and poor social services, with farming as their main occupation (Federal Ministry of Environment, 2002).

Further, focus on the size and nature of income distribution would give an insight as to

reasons for mass exodus from the rural to the urban centers. This has far reaching economic consequences for both the rural and the urban centers especially in the area of food and raw material production as agriculture constitutes 43% of the GDP (Ukwu, 2000). The production of the farmer is essential for subsistence and the sustenance of the manufacturing sector, which requires raw materials as their input in production. In turn, some of the outputs of the manufacturing sector serve as inputs for these rural farmers in their primary production. This intertwined relationship would definitely be affected by income disparity and distribution, in terms of demand and supply. Moreover, the knowledge of income distribution of rural and urban areas is vitally important in comparative analysis and would assist policy makers in formulating appropriate fiscal and monetary policies or programmes such as poverty reduction.

The central goal of this paper therefore, is to investigate the magnitude of income and the nature of income distribution among the rural farmers in Imo State, Nigeria, with the view of making appropriate recommendations for policy formulation. In specific terms, the study endeavored to; determine the magnitude of the farmers income; investigate the existence and the nature of income inequality among the farmers; identify factors which affect their income; and compare the income of the farmers with those of the civil service workers (Harmonized Public Service Salary Structure (HAPSS)) for the Federal Public Service. Apart from the Introduction, the paper discussed the topic from the following perspectives: Research Methodology; Results and Discussion; and Conclusion and Recommendations.

## RESEARCH METHODOLOGY

The study was carried out in Imo State, Nigeria. The State is one of the 36 states of Nigeria and is located in the South-eastern part of the country. It is made up of three Agricultural zones, namely; Owerri, Okigwe and Orlu. Two of the zones, Owerri and Okigwe were purposively selected because they are richly endowed with both minerals and agricultural resources, with high intensity of agricultural activities.

The monthly temperature of the area ranges between 18<sup>o</sup> –25<sup>o</sup>c while the annual rainfall is about 2463mm. The areas are therefore suitable for the cultivation of a broad spectrum of tropical crops such as yams, cassava, cocoyam, vegetables as well as economic trees like; oil palm, cola, cashew, mango, plantain, banana, bamboo, Iroko, gmelina, mahogany and rubber. The population of the state is 3,724,108 people a population density/km<sup>2</sup> of 704 (National Population Commission/Imo State Planning Economic Development Commission, 2007).

Data were collected from both primary and secondary sources. Primary data were collected from a sample survey of 100 rural farmers, 50 each from

the two agricultural zones selected. This figure was made up of cassava (36), yam (28), vegetable (3), oil palm farmers (3) and poultry farmers (30) and they came into the sample by chance. The sampling technique used was the stratified random method. Four sub-zones were crafted out from each agricultural zone and from which four communities were purposively selected based on cultural affinity. The sub-zones from Owerri were; Aboh/Ahiazu/Ezinihitte Mbaise, Egbema/Ohaji, Egbu/Oguta, Mbaitoli/Ikeduru and Owerri West/North; and five of the communities randomly selected were; Amumara, Awara-Assa, Ihitegbu, Amimo and Obibezena, respectively. The sub-zones from Okigwe were; Mbano, Etiti, Otanchara, Okigwe Suburb, Otot; and the communities randomly selected were; Agbaja, Amainyi Ukwu, Ezinachi, Ubahu, and Okwelle; respectively. From each of these villages 10 respondents were selected. Thus, giving a total of 100 respondents for the two zones. The list of the farmers, were obtained from the extension agents and local government councils, which constituted the sample frame. Collection of data was done with the use of questionnaire which was completed with the use of interview schedule by the researcher and trained field assistants. The data for income was collected from male-headed households in addition to the wife's income especially monogamous family. Also, estimates of income from non-agricultural sources were made and added to the farm incomes. The secondary data were obtained from annual reports, books, journals, periodicals, seminar papers, etc.

In data analysis, three statistical techniques used were: **Income Inequality Measurement, Profitability Index, and Multiple Regression Analysis.**

There are two measures of income distribution; the personal or size distribution of income and the functional or factor share distribution of income (Todaro and Smith, 2009). The size distribution was employed in this analysis. The three tools used in this respect were; Gini, Slope and Kuznet Indices.

Gini index measures the area between the Lorenz curve and the line of perfect equality and the total area of the triangle below the diagonal. It is the quotient of the area between the 45<sup>o</sup> line and the Lorenz curve and the total area under 45<sup>o</sup>line. Gini coefficient measures the degree of inequality of income distribution among families and a lower coefficient indicates greater equality, i.e. the more equitable the distribution of income. In otherwards, Gini can vary anywhere from 0 (perfect equality) to 1 (perfect inequality) (Todaro and Smith, 2009). This suggests that the more nearly equal the income distribution, the closer its Lorenz curve to the 45 degree line and the lower the Gini coefficient. On the other hand, the more unequal the income distribution, the farther its Lorenz curve from the 45 degree line, and the higher the Gini

index. (<http://www.indexmundi.com/Nigeria/distribution>). To perform the necessary calculations, use was made of trapezoidal method (Spencer, 1973). In this For a triangle  $A = \frac{1}{2}bh$  .....(1)  
For a trapezoid  $A = \frac{1}{2}b(h_1+h_2)$  ... (2)

dispensation, area (A) in terms of the base (b) and the height (h) was calculated as follows:

Slope index compares the nature of all possible slopes at different points on the Lorenz curve with that of the diagonal or the line of equal income distribution. The slope ratio (SR) is defined by:

$$SR = \sum_{i=1}^n \frac{(G_i-1)}{r_i} \quad i = 1,2,3,\dots,n;\dots(3)$$

$r_i$  = Proportion of income recipients in group  $i$   
 $G_i$  = Proportion of income received by recipients in group  $i$

Kuznet Index is the ratio of the incomes received by the top 20% and the bottom 40% of the population.

Profitability Index (P.I.) was used to measure the profitability of the respondents' enterprises. It was measured by gross income per ₦1.00 input cost. Statistically, this is represented by:

$$P.I. = \sum_{i=1}^n \frac{Y_i}{C_i} \quad i = 1, 2, 3, \dots, n; \dots(4)$$

Where  $Y_i$  = Gross income  
 $C$  = Expenses incurred  
 $n$  = Number of respondents.

The Multiple Regression Analysis was used to establish the relationship between the income of the farmers and the explanatory variables, such as farm size(ha), loan size, profitability, age(years) and number of dependents. The general form of the (unstandardized) regression is:

$$Y^1 = A + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k; \dots(5)$$

Where  $Y^1$  represents the estimated value for  $Y$   
 $A$  = the  $Y$  intercept (a constant)  
 $\beta_{1-8}$  = non standardized regression coefficients.

The Coefficient of Determination ( $R^2$ ) gives the goodness of fit and elicits the proportion of variation in income explained by the variables included in the regression equation. In the Multiple Regression analysis, four functional forms: Linear, Semi-log, Double log, and Exponential were fitted to the data. The linear function was selected on account of its highest Coefficient of Multiple Determination ( $R^2$ ), and signs of the coefficients of the explanatory variables vis-à-vis the *a priori* expectations.

## RESULTS AND DISCUSSION

### • Summary of Socio-Economic Characteristics:

The main occupation of the respondents was farming. Of the 100 respondents interviewed 70% were involved in crop farming while the remaining 30% were involved in poultry farming. Trading was the next important occupation of the respondents. Income accruing from these two sources to the family was put together. Males dominated in both crop and poultry farming. Sixty four percent (64%) of the crop farmers were males while 73% of males were involved in poultry farming. Generally, the farming operations were jointly carried out by family members, children inclusive. The average number of dependents (children and relations) per respondent was 8.2 while the average number of children per respondent was 6.8. The average age of the

respondents was 46.05 years. The mean age of food croppers was 49.2 years while that of the poultry farmers was 40.8 years. The mean number of years spent in school by the respondents was 6.6 years. The figure, for crop and poultry farmers were 4 years and 7.8 years respectively. The average farm size for crop farmers was 0.75 hectare (14.92 plots) while the mean stock of birds was 104. The major problems of the farmers were; financial assistance in the form of working capital and start-up capital. Others were lack of necessary infrastructural facilities like roads, transportation, improved seedlings and inputs. Only 20% of the farmers belong to co-operative societies even though they were essentially small and subsistence farmers.

From the above, it is obvious that the participation of youths in farm operations was minimal although relatively higher in poultry than crop farming. This may be due to the fact that poultry farming is more demanding, technical and riskier than crop farming in terms of input requirements and operations. Also, it was observed that the literacy level of the respondents was low. This means that our graduates of agriculture from tertiary institutions are yet to step into the activities of this preferred sector. The average farm size of 0.75 hectare and mean stock of birds of 104 confirmed the smallness of the scope of their operations.

- **Profitability Index**

Evaluation of the farmers performance based on annual income per se (that is without cost) is likely to beclouded and misleading. Therefore, considerations were accorded production costs to determine the level of profitability, which served as an index of the management ability of the farmers. Thus, the farmer's profitability was measured by income per unit cost. The mean profitability of the crop farmers was 1.38 as against 1.25 for poultry farmers. This low profitability of the poultry farmers despite their relatively higher income could partly be attributed to the high cost of feeds, day old chicks, incidence of pests and diseases and size of operation, which adversely affected their income.

- **Income Distribution Pattern of the Survey Farmers:**

**Intra Occupational Comparison:**

The respondents were categorized into ten different groupings (deciles) as depicted in Table 1. The mean annual income for the lowest group was N9, 750 while that of the highest was N94, 500 (USD1.0=N152). The mean annual income of the survey farmers was N52, 255. If this is decomposed into major enterprises – crop and poultry farming, the figures are N40, 071 and N86, 200, respectively. The lowest group, which was made up of 5% of the total respondents controled about 1.02% of the income while the highest which was made up of 5% of total respondents controled 11.63% of total income earned.

A comparison of the share of total income by the lowest three groups (42% of the respondents) to the income of the two highest groups (10% of the respondents) revealed this income disparity of the farmers. In the former, the share of income was 19.81% of total income earned. In other words, one farmer in the lowest income group earned an annual income of 0.47% of total income or N19, 949.61. In the two highest groups, the share of total income was 21.89% of total income or N92, 586. This implies that the low income farmers are having a less than “fair” share of the total income as opposed to the “high” income farmers who earn more than “fair”

share of total income in purely relative terms. A fair share of total income would mean that each farmer earns about N52, 755 (mean income) per annum. This suggests that it is in the middle income group (5<sup>th</sup> to 6<sup>th</sup>) that incomes of the farmers were reasonably proportionate. In this group, 22% of the farmers earned about 26% of the total income. As expected, the mean annual income of the survey farmers is found in this group.

From the foregoing analysis it was observed that income inequality exist among the survey rural farmers and this was confirmed by the existence of the Lorenz Curve (Figure 1), which is a deviation curve from the 45<sup>0</sup> line or line of equality obtained in the “Income Earned and Earner’s box” and the low Gini coefficient and slope index.

The results of the various indices calculated were as follows:

Gini Coefficient (GC) = 0.460

Slope Index (S1) = 0.460;

Kuznets Index = 0.50 (See Appendices 1 and 2).

These results appeared consistent with the CIA World Fact book Statistics as at December 30, 2010. It reported the Nigeria Distribution of Family Income; Gini Index of 0.437 (2003) and 0.506 (1997) (<http://www.indexmundi.com/nigeria/distribution> of family income).

The mean annual income of N52, 755 of the survey farmers appears moderate but worrisome. This may be attributed to the predominance of both yam and poultry farmers (who constituted 58% of the respondents) and whose incomes were relatively higher. In addition, the farmers also obtained about 21% of their income from non-farm sources. This is at variance with the non-farm income share of 42%-50% for Africa as reported by several studies (Reardon et al, 1998; Little et al, 2001). Thus, bringing to question, over generalization of research results.

Further, about 68% of both cassava and yam farmers were consumed by their families whose average size was 8.2. This suggests that the farmers are essentially subsistence farmers.

**Table 1: Income Distribution among Survey Rural Farmers in Imo State, Nigeria.**

<b>Income Groupings (N)</b>	<b>Total Income Received (N'000)</b>	<b>% of Income Received (Earned)</b>	<b>Cumulative Frequency %</b>	<b>% of income Earners</b>	<b>Commulative Frequency %</b>	<b>Mean Income (N'000)</b>
0 – 10,000	43.20	1.02	1.02	5	5	9.75
10,001-20,000	266.00	6.28	7.30	16	21	18.20
20,001-30,000	528.60	12.50	19.81	21	42	28.10
30,001-40,000	461.60	10.91	30.70	13	55	39.00

40,001-50,000	540.00	12.77	43.49	12	67	48.00
50,001-60,000	559.60	13.23	56.72	10	77	58.10
60,001-70,000	441.20	10.43	67.15	7	84	66.80
70,001-80,000	463.40	10.96	78.11	6	90	77.10
80,001-90,000	434.00	10.26	88.37	5	95	88.00
90,001-100,000	492.00	11.63	100.00	5	100	94.50
	4,229.60	100.00		100.00		Y=52.755 (mean)

Source: Field Data, 2011. Exchange Rate: USD1.00=N152, CBN Annual Report & Statement of Accounts (2010).

#### Inter Occupational Comparison:

An inter occupational comparison between farming and public service sector's income indicated that the lowest paid and highest paid civil servants earn income of 2.15 and 29 times, respectively more than the average farmer's income (N52,755).

According to 15% Increase Salary Scheduled for Imo State Public Service of 18<sup>th</sup> June, 2008, the total annual emolument of Grade Level 01 Step 1 (lowest salary) is N115, 475 and Grade Level 17 Step 9 (highest salary is N1, 529,196.52). This is undesirable. Its economic implications in terms of exodus to urban centers, high cost of food and fiber and crime rates have far reaching consequences.

#### • Governing Variables and Regression Results

It was postulated that the income among the rural farmers had:

- a positive relationship with:

Farm size ( $X_4$ ), Level of education ( $X_3$ ), Size of loan ( $X_7$ ), Profitability ( $X_8$ ), and Level of technology ( $X_5$ ).

Level of Technology was measured (on a cumulative basis) on a 5 point scale as follows:

\*Use of hoes and cutlasses only.....0 point

\*Use of wheel barrow, shovels and higher implements in addition to the above.....1 point

\*Hire of tractor .....2 points

\*Use of improved inputs (such as cassava stems –TMS 3057) .....3 points

\*Use of improved cultural practices e.g. use of cover crops and organic manure..... 4 points

- a negative relationship with

Farmers age ( $X_1$ ), Numbers of dependants ( $X_2$ ), Incidence of pests, diseases and natural disasters e.g. flooding, and erosion ( $X_6$ ).

Incidence of pests, diseases and natural disasters were measured (on a cumulative basis) on a 5 point scale as follows:

\*Major attack of pests (e.g. mealy bug, locusts and ticks) .....4 points

\*Major attacks of diseases (e.g. cassava blight and Newcastle) .....3 points

\*Major flooding of farm.....2 points

\*Serious gully erosion of the farm.....1 point

\*Absence of any of the above.....0 point

These were all regressed against income (Y) i.e. the dependent variable for both crop and poultry farmers. The result of the regression analysis for gross farm income  $Y_1$ , for crop farmer was shown in Table 2, while that of the poultry farmers,  $Y_2$  was shown in Table 3.

The following functions define the result of the regression analysis:

#### For crop ( $Y_1$ ):

$$Y_1 = -597.3215 + 0.04609 X_1 + 0.06634 X_2 + 0.02731 X_3 + 0.29533 X_4 + 0.23027 X_5 - 0.24634 X_6 + 0.22275 X_7 + 0.07298 X_8$$

$$R^2 = 0.55844$$

$$\text{Standard Error} = 853.29291$$

The coefficient of Determination ( $R^2$ ) implies that 55.84% of the differences in Gross Income  $Y_1$  were as a result of variations in the independent variables  $X_1$  to  $X_8$

#### For poultry ( $Y_2$ )

$$Y_2 = 1038.135 - 0.04851 X_1 + 0.16030 X_2 + 0.10702 X_3 + 0.30466 X_4 - 0.02102 X_5 - 0.48275 X_6 - 0.22862 X_7 + 0.24215 X_8$$

R<sup>2</sup> = 0.73538%  
 Standard Error = 774.384

The coefficient of Determination, R<sup>2</sup>, suggests that about 74% of the differences in gross income Y<sub>2</sub> was explained by variations in the independent variables X<sub>1</sub> – X<sub>8</sub>, which suggests that there are other factors too. As stated in the methodology, the linear functional form was preferred to the other functional forms namely Semi-log, Double log and Exponential, based on their high R<sup>2</sup> among other criteria.

The data in Table 2 showed that Level of Education (X<sub>3</sub>), Farm Size (X<sub>4</sub>), Level of Technology (X<sub>5</sub>), Size of Loan (X<sub>7</sub>), Profitability (X<sub>8</sub>), were positively signed while Natural Disaster (e.g. flooding and erosion) (X<sub>6</sub>) was negatively signed with crop farmers' income (Y<sub>1</sub>) in conformity with *a priori expectations*. Farmers Age (X<sub>1</sub>) and Number of Dependents (X<sub>2</sub>) related positively contrary to the prediction. However, the coefficients of Farm Size (X<sub>4</sub>), Incidence of Disease and pests (X<sub>6</sub>), Size of Loan (X<sub>7</sub>) and Level of Technology (X<sub>5</sub>) were significant at 5% level, and hence exert considerable influence on crop farmers' income in varying degrees. The policy implication is, to achieve any increase in crop income, efforts must be made to increase areas cultivated as well as use of improve seedlings and implements. Also, size of loan

**Table 2: Determinants of Income for Crop Farmers**

Explanatory Variables	CoefficientsB	STD ERRORS B	T (t-cal)
X <sub>5</sub> Level of Technology	367.5301	196.46380	1.87*
X <sub>4</sub> Farm Size	45.66672	16.37551	2.79**
X <sub>7</sub> Size of Loan	387.5462	185.35986	2.09*
X <sub>6</sub> Incidence of Diseases, Pests & Disasters	479.2787	205.92315	2.33*
X <sub>2</sub> Number of Dependents	13.15580	22.70643	0.58
X <sub>8</sub> Profitability	0.1138447	0.14765	0.78
X <sub>1</sub> Farmers age	5.324712	13.93374	0.38
X <sub>3</sub> Level of education	7.487663	31.47537	0.24
(CONSTANT)	-597.3215		
R <sup>2</sup> = 0.55844			
F-Value = 9.64334			
Std. Error = 853.29291			
N = 61			

Source: Extracts from Computer print-out (2010).

\* 5% LOS \*\* 1% LOS

**Table 3 Determinants of Income for Poultry Farmers**

Explanatory Variables	Coefficients B	STD ERROR B	T (t-cal)
X <sub>6</sub> Incidences of Diseases, Pests & Disaster.	-868.6024	333.06294	2.61**
X <sub>4</sub> Farm (Size) Stock	2.737379	1.69734	1.61
X <sub>7</sub> Size of Loan	-728.5088	431.90404	1.69
X <sub>8</sub> Profitability	0.2745792	0.21756	1.29
X <sub>2</sub> Number of Dependents	65.69207	56.55942	1.16
X <sub>3</sub> Level of Education	30.53031	58.26382	0.52

extended to the small-scale farmers should be enhanced for effective operations of farm activities and results. Further, the incidence of pest, diseases and natural phenomenon (e.g. erosion) which have not received appropriate attention in most government policies and programs should be given priority consideration in order to enhance food security. This has become necessary as most of the areas of the study are prone to serious erosion problems and gross inadequate infrastructural facilities..

Similarly, Table 3 indicated that apart from Loan Size (X<sub>7</sub>) all other variables predicted for positive relationship with the poultry farmers' income were as postulated. Further, poultry farmer's income (Y<sub>2</sub>) had negative relationship with Farmers Age (X<sub>1</sub>) and Incidence of Pest and Diseases (X<sub>6</sub>) as postulated. Incidence of Pests, Diseases and Natural Disaster (X<sub>6</sub>) only exerted considerable influence on the poultry farmer's income than other variables as it was significant at 5% level. It is interesting to note that Incidence of Pest and Diseases and Natural Disaster (X<sub>6</sub>) have negative relationships with both crop and poultry farmers. This suggests that due attention must be given to these determinants in order to enhance farm income.

X <sub>1</sub>	Farmers age	-5.645688	19.71193	0.29
X <sub>5</sub>	Level of Technology	-46.16516	389.91991	0.12
	(CONSTANT)	1038.135		
<hr/>				
	R <sup>2</sup>	=	0.73538	
	F-Value	=	7.29485	
	Std. Error	=	774.38400	
	N	=	21	

Source: Extracts from Computer print-out (2010)

\* 5% LOS                      \*\* 1% LOS

### CONCLUSION AND RECOMMENDATIONS:

It is apparent that the average annual income of N52, 755.00 for the survey farmers is relatively low. This became even glaring when compared with the annual earnings of N113, 475 for the lowest paid public servant in the state harmonized salary structure. The ratio of the average income of the survey farmer to the lowest paid public servant was 1:2.15. The ratio was 1:29 when the average farmer's income was compared with the highest paid public servant's income (N1,529,195.52). This portends great danger for our agricultural production, in terms of food and fibers, as it is capable of triggering off mass exodus from the farm or rural areas to the already congested urban centers. The ratios are expected to be higher when compared with the Federal Public Sector, whose salaries are usually higher and possibly worst with the recent negotiated increase in public salary structure, which was recently released.

Among the selected farmers, income inequality existed although it could be regarded as moderate. This was depicted by the Lorenz curve and confirmed by the average Gini and slope indices of 0.460 each; and Kuznets Index of 0.50. These suggest that the selected rural farmers can be grouped into the same subset for policy formulation.

It was noted that farm size and incidence of pests and diseases exerted considerable influence on crop farm income than other factors and are therefore, the main determinants of income for these group of farmers. For the poultry farm, the incidence of diseases and pests also had considerable influence than other factors.

Given the above situation and to avoid escalating food security problems, raw materials scarcity and their concomitant inflationary pressures as well as possible urban congestions resulting from exodus from rural areas, it has become imperative for government to put in place effective support programs to assist the rural farmers. Incentives such as subsidized inputs (like fertilizer, improved seedlings), capacity building, appropriate technology, storage facilities and measures to minimize the incidence of diseases and pests should be provided. Further, incentives and programs to attract young and educated men into accepting the challenges of modern farming should be invested in. Such supports as training programs and fiscal incentives should be given due attention. As a perforce, is the

provision of financial assistance in the form of "activation loan" or start-up loans for kick-starting and expansion of agricultural projects especially for young school leavers and graduates. Of vital importance is the urgent need for the Nigerian government to address the gross inadequate infrastructural facilities (such as pipe-borne water, electricity, poor transportation system and road networks) characteristic of the rural areas, which harbor over 60% of Nigerians and where a greater proportion of the food and fibers are produced. Provision of improved and resistant varieties/stocks to the small scale farmers would in no small measure reduce the incidence of pests and diseases. It is also advocated that farmers should form combines and co-operatives to work together. To encourage others to follow suit, incentives in the form of soft credits and subsidized inputs should be channeled to such combines. Furthermore, environmental and erosion control measures should be put in place or strengthened, if there are existing ones.

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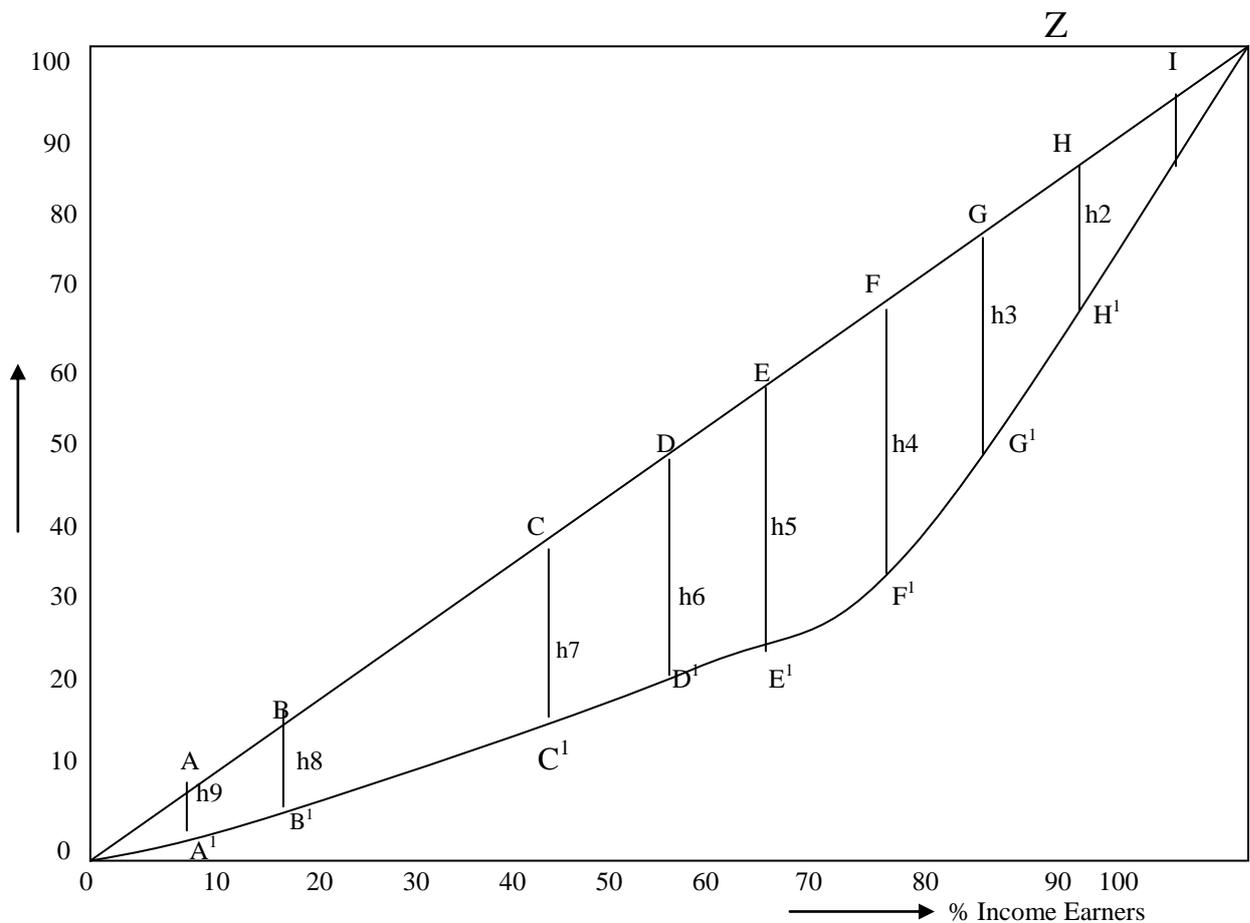
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**Figure 1**

**Lorenz Curve of Income Distribution Among Survey Farmers in Owerri and Egbema/Ohaji/Oguta LGAs, In Imo State**



**APPENDIX I**

Gini Coefficient Calculation:

From Figure I

Areas of a triangle =  $\frac{1}{2}$  base x height

Area of a trapezium =  $\frac{1}{2}$  base x height of the 2 parallel lines  
 =  $\frac{1}{2}$  (h1 + h2) x base

Calculation of base by Pythagoras theory

e.g.  $OZ^2 = 10^2 + 10^2 = 2000$   
 $OZ = 200 = 14.14$

<u>Height</u>	<u>Base</u>	<u>Area</u>
H1 = 7	ZI = 6.40	$\frac{1}{2}(ZI)hI = \frac{1}{2}(6.40)7 = 22.40$ (Triangle)
H2 = 12	IH = 7.81	$\frac{1}{2}(h1+h2) \times \text{base} = 74.20$
H3 = 9	HG = 8.49	$\frac{1}{2}(h2+h3) \times \text{base} = 89.15$
H4 = 20	GF = 9.90	$\frac{1}{2}(h3+h4) \times \text{base} = 143.55$
H5 = 24	FE = 14.14	$\frac{1}{2}(h4+h5) \times \text{base} = 311.08$
H6 = 24	ED = 16.97	$\frac{1}{2}(h5+h6) \times \text{base} = 407.28$
H7 = 24	DC = 18.38	$\frac{1}{2}(h6+h7) \times \text{base} = 441.12$
H8 = 13	CB = 33.94	$\frac{1}{2}(h7+h8) \times \text{base} = 627.89$
H9 = 4	BA = 19.80	$\frac{1}{2}(h8+h9) \times \text{base} = 168.30$
	AO = 5.66	$\frac{1}{2}(AO)h9 = \frac{1}{2}(5.66)4 = 22.64$ (Triangle)
		<u>2307.61</u>

Area of ZOY =  $\frac{1}{2}$  base x ht  
 =  $\frac{1}{2} \times 100 \times 100$   
 = 5,000

Gini Coefficient =  $\frac{2307.61}{5000} = 0.460$

APPENDIX II

**Slope Index Calculation**

$$\text{Slope Index (S.I)} = \sum_{i=1}^i \frac{(I_i - 1) r_i}{r_i}$$

(From Table 1)

$\frac{(1.02 - 1) 5}{5}$	=	-4.00	
$\frac{(6.28 - 1) 16}{16}$	=	-9.78	
$\frac{(12.49 - 1) 21}{21}$	=	-8.61	
$\frac{(10.91 - 1) 13}{13}$	=	-2.21	-24.58
$\frac{(12.76 - 1) 12}{12}$	=	-0.72	
$\frac{(13.23 - 1) 10}{10}$	=	3.20	
$\frac{(10.43 - 1) 7}{7}$	=	3.43	
$\frac{(10.95 - 1) 6}{6}$	=	4.92	
$\frac{(10.26 - 1) 5}{5}$	=	5.25	+24.12
$\frac{(11.63 - 1) 5}{5}$	=	<u>6.60</u>	

**-0.460**

**Kuznets Index (KI):** Is the ratio of the incomes received by the top 20% and the bottom 40% of the population.

$$KI = \frac{N463}{N919.7} = 0.50$$