

ANALYSIS OF INCOME INEQUALITIES AND FOOD SECURITY AMONG FARMERS IN ABIA STATE, SOUTH EASTERN NIGERIA

Nnanna M. AGWU¹, Ogbonnaya Ukeh OTEH²

¹Michael Okpara University of Agriculture, Department of Agribusiness and Management, Umudike, Abia State, Nigeria; E-mail: agwu.nnanna0613@gmail.com

²Michael Okpara University of Agriculture, Department of Marketing, Umudike, Abia State, Nigeria, E-mail: ogboteh@gmail.com

Corresponding author: ogboteh@gmail.com

Abstract

The study analysed income inequalities and food security status of farmers in South Eastern Nigeria, using Abia State. Specifically, the study accessed the income inequalities of the farmers; determine the food security status of the farmers; estimate the factors that influence food security among the farmers in the study area. Multi-stage sampling technique was adopted in the selection of location and 180 respondents used for the study. The study employed Gini-coefficient, food security index and multiple regressions in the analysis of the data collected. Result shows that Gini coefficient value was 0.67, showing that there was high income inequality in the study area. Majority of the respondents, constituting about 68.57 percent were food insecurity in the study area. The regression results showed that age of the household head, educational attainment of the household head and monthly income of the head were the major determinants of food security status in the study area. The study recommends that government policies targeted at farmers should be strengthened, in order to bridge the gap in farmers' income. Government should also create opportunities for small scale businesses to flourish in rural areas. This will provide the people the much needed income, amongst other things.

Key words: farmers, food security, Income, inequalities, South Eastern Nigeria

INTRODUCTION

Income distribution pattern over the years has been a major concern in the determination of the level of economic growth and development of any country. Specifically, the 19th century witnessed resurgence in theoretical and empirical attention by economists to the distribution of income and wealth [13]. In Nigeria, between 1965 and 1975 serious income disparity widened substantially [22, 11, 18]. This means that though the economy seemed to be performing strongly, the gap between the lower income households and the upper income households widened, which was an indication that the rapid economic growth experienced had only resulted in further concentration of national income in the hands of few proportion of the population [22, 16]. The level of income inequality according to [11] worsened after the Structural Adjustment Programme (SAP) of 1986.

Using the National Living Standard Survey

(NLSS) data, [32] found out that the overall Gini-index for Nigeria was 0.580. Sectorically, income inequality was seen to be higher in the rural areas when compared with the urban areas; and that employment income increases income inequality while agricultural income decreases it. Income inequality has been known to be closely related to poverty [5, 2, 1]. As a result, income inequality can be detrimental to economic growth and development of any country.

Although predicted poverty reduction scenarios vary greatly depending upon the rate and nature of poverty related policies, actual evidence suggests that the depth and severity of poverty is still at its worst in Nigeria [27]. This situation is very disturbing and worrisome given the huge human and material resources that have been devoted to poverty reduction by successive governments and yet no noticeable success has been achieved in this direction. Furthermore, despite the commitments already shown by many countries including Nigeria

and the global approach as enshrined in the Millennium Development Goals towards the achievement of the goal of reducing income inequality, efforts geared at achieving this have been greatly hindered by insufficient knowledge of how to design appropriate policies that would call for broad participation, the modality of their implementation procedures and measurement of the overall impact on the economy.

A high level of income inequality exists between Nigerian rural and urban area [32]. There also exists variations in the level of income obtained by people in the rural areas is on the increase which could very much be linked to the growing dimension of poverty even among the rural households, as high level of income inequality produces an unfavourable environment for economic growth and development [31]. This differential between rural and urban incomes, most times, accounts for the rural-urban migration and hinders food security.

Food security is defined as when all people at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and for food preference for an active and healthy life [6]. Food as a basic necessity of life is seen in the fact that it is a means of sustenance and an adequate food intake in terms of quantity and quality, is a key for a healthy and productive life [29]. The importance of food is also shown in the fact that it accounts for a substantial part of a typical household budget. The concern for food security and nutritional well-being in an economy is predicted by role of human element in economic development [26]. The economic development of a nation in turn is dependent on its factor endowment. This includes the non-human and human resources. The productive capacity of the human resources is however, a function of how well they are fed.

Food scarcity is currently both a fundamental objective and an expected outcome of development policies in Nigeria as the country faces a challenge in meeting the basic food needs of its over growing population. Available data from the NBS (2003) [23] and the NDHS (2003) [24], showed that, the

Nigerian population especially women and children lived in severe social desperation, with many households being food insecure, with poor access to resources to meet basic needs, resulting in nutritional deficiencies.

Over the years, a lot of programmes have been instituted to ameliorate the problem of food security in Nigeria. Among the programmes are, the establishment of the Rural Integrated Agricultural Development Programme (ADP), Green Revolution Programme (GR) Agro-service Centre Programme (ASC), National Seed Service (NSS), Operation Feed the Nation (OFN), Directorate of Food, Road and Rural Infrastructure (DFRRI), National Agricultural Land Development Agency (NALDA), National Accelerated Food Production (NAFP), National Special Food Production (NSFP), Family Support Programme (FSP), Family Economic Advancement Programme (FEAP), Better Life Programme (BLP) and more recently presidential initiatives on cassava, yam, cocoa yam, rice, vegetable oil etc. all these are aimed ensuring food security and reducing income inequalities in Nigeria.

Despite, all these attempts, Nigeria have had a varied history of both good and bad of the food production, sustainability and food security [30]. Government at various times through various programmes has intervened, but the food deficit argument by food imports have remained and seem to be on the trajectory that is up and down of increase. Food security is also on top of the Millennium Development Goal of the United Nations and Federal Government development agenda. However, the goal of food security seems increasingly elusive because the formulation and implementation of agricultural policies alone are not yielding the desired results [33]. The consequences are that more Nigerians live below poverty line and are food insecure. This is exacerbated by the wide disparities i.e. the differences that are increasing between the urban and rural areas.

Given the high rise in prices, food importing nations like Nigeria will face increased costs in meeting domestic food demands. The implication is that the already existing hunger, malnutrition and food insecurity will re-double.

This emerging scenario in Nigeria has engendered a bloat in the percentage of food insecure households, especially those residents in the rural areas where the effect of government policies are rarely felt and as such inequalities will continue to widen. Statistically, the percentage of food insecure households was reported to be 18 percent in 1986 and over 40 percent in 2005 [33]. This figure seems to be increasing by the day; because of inequalities in income and poverty status of majority. Many studies have indicated the relationship between income and food consumption [4, 14, 7, 8, 9].

Over 70 percent of the population lives in the rural areas. Often in conditions of chronic poverty, characterized by subsistence production, limited access to markets, distribution network and opportunities for income generation [21]. While overall socio-economic development has taken place, disparities i.e. there are difference between rich and poor, are increasing among urban and rural areas [21]. The causes and implications of changes in inequality in many societies remain unclear [34]. The components that make up the acceptable standard of living can be represented as a composite whole by the real income expressed in currency values, in this case naira. Since, poverty can be linked to the income level of individuals of households and their standard of living is a measure of income obtained or received by them. It then becomes necessary to analyse income inequalities and food security of farmers in Abia State, Nigeria, where the occupation of majority, especially those in the rural area is farming. Specifically, the objectives of the study are to: access the income inequality of the farmers; determine the food security status of the households; determine the factors that influence food security among the farmers in the study area; and make recommendations based on the findings.

MATERIALS AND METHODS

The study area is Abia State. Abia State is one of the 36 States in Nigeria. The State lies

between Longitude $04^{\circ} 45'$ and $06^{\circ} 07'$ North and Latitude $07^{\circ} 00'$ and $08^{\circ} 10'$ East. It is situated in the South-East geo-political zone of Nigeria and is bounded by Imo State on the West, Ebonyi and Enugu States on the North, Cross Rivers and Akwa Ibom States on the East and Rivers State on the South. The State has a population density of 580 persons per square kilometer and a population of 2,833,999 persons (NPC, 2007) [25]. It has three senatorial zones namely Abia North, Abia South and Abia Central with seventeen Local Government Areas (L.G.As). Agriculturally, the State is divided into three agricultural zones also. They are Umuahia, Ohafia and Aba Zones.

The climate of the State is a tropical one and usually humid all year round; with two seasons, the rainy and the dry seasons. The rainy seasons starts from March to October while the dry season starts from November and ends February/March.

The major occupation of the people is farming and the major crops grown are Maize, yam, cassava, rice, vegetable, etc. Livestock kept include, goat, sheep. Pigs, etc. Plantain, palm oil, cocoa and rubber are some of the cash crops produced by the people.

Umuahia, Aba and Ohafia are the urban areas, while the rest are rural. Aba which is the commercial nerve centre of the State is home to many industrial outfits including agricultural processing firms.

Multi-stage sampling technique was adopted for this study. First, two Local Government Areas (L.G.As) were selected from each of the three agricultural zones. From these Local Government Areas, three communities were chosen. Finally, a random selection of twenty farmers was selected each from the three communities, bringing a total of one hundred and eighty (180) farmers/respondents. Primary source of data was used for the study. In order to realize the objectives, Gini-coefficient; food security index, and multiple regressions was employed. The model for the Gini-coefficient is specified thus:

$$Lgin(y) = 2 \sum_{i=1}^n i \left[-\frac{n+1}{2} \right] y_i$$

Where: n = number of observation
 μ = mean of the distribution
 y_i = income of the jth household
 IGINI = Income Gini

This model has been used in the past by [31].
 The food index formula is given as:

$$Fi = \frac{\text{per capital food expenditure for the } i\text{th households}}{\frac{2}{3} \text{ means per capital food expenditure of all household}}$$

Where Fi = Food security index
 When Fi ≥ 1 = Food secure ith household
 Fi ≤ 1 = Food insecure ith household

This model has been used in the past by [29].
 The implicit function of the multiple regressions is given as:

Q = f(X₁ X_n e)
 Q = expenditure on food and non food items
 X₁..... X_n = explanatory variables
 e = error term

The four functional forms of the model, linear, Semi-log, double log and exponential were tried and the one (double log functional form) that gave the best fit based on econometric considerations was chosen.

RESULTS AND DISCUSSIONS

Assessment of the Income Inequality among the Respondents

The Gini-coefficient has been used in the past to measure the level of inequalities in many other contexts besides income, including wealth, education, energy consumption, etc [19]. However, this study was based on income inequalities. Inequality decomposition is a standard technique for examining the contributions of inequality of particular characteristics and can be used to assess income recipient characteristics and income package influences [32, 10]. According to [15], inequality can be conceptualized as the dispersion of a distribution, whether one is considering income, consumption or some other welfare indicators.

In this study the Gini coefficient obtained using the formula as specified above was

0.67. This result means that there is a high income inequality in the study area. According to [17]; Gini coefficient higher than 0.35 indicates higher inequality. Poverty and income inequality are closely related and it has been argued that income inequality is a manifestation as well as strong cause of poverty [35]. Furthermore, [20] found that a high level of poverty in the late 1990s in Russia was due more to the rise in income inequality. Thus as income inequality increases, the incidence of poverty also increases. The result of the present study is in line with the findings of other researchers [eg., 3, 37].

Food Security Status of the Household in Abia State, South East, Nigeria

The Table 1 shows the food security status of the respondents in the study area. The results revealed that majority of the respondents are food insecure. The food insecure household constituted about 68.57 percent while food secure household constituted about 31.43 percent.

Table 1. Distribution of food security status of the respondents

Food security index	Frequency	Percentage
< 1.00	48	68.57
> 1.00	22	31.43
Total	70	100

Source: Computation from Field Survey Data 2013

Determinants of Food Security Status among farming Households in Abia State, Nigeria

As shown in Table 2, the double log functional form was chosen as the lead equation based on some econometric considerations, like the number of significant variables, the R²-value and the F-ratio value. The results of the Ordinary Least Square (OLS) estimates showed that age of the household head, educational attainment of the household head and monthly income of the head were significant at various probability levels and therefore determinants of food security status in the study area.

Age of the household head was significant at one percent probability level with a positive sign. This implies that the older the household head, the probability of that particular

household been food secure. This result is in contrast with [29]. The possible explanation could be that with increasing age, household heads must have finished training some of their children and then depend mostly on these children to supply their food needs or household needs. The coefficient of educational attainment of the household was positive and significant at 10 percent probability level. This implies that the higher the level of education of the head, the more food secure that households will be. Education as it were has the tendency of exposing people and placing them in vintage positions over others who are not so much educated. This includes the knowledge of food combination among other things. This result disagrees with [28] but agrees with

[10].

Monthly income of the household head was positive and highly significant at one percent probability level. This means that as monthly income of the household head increases, there is 99 percent probability that the household will be food secure. Income had a positive sign and statistically significant at 99 percent confidence level. Increasing income means that households should be able to have access to food through affordability. This finding is consistent with [29, 36]. The R^2 as 0.646, meaning that 64.6 percent of the variability was explained in the model; while the F-ratio was 5.377 which are significant at one percent signifying the overall fitness of the equation.

Table 2. Estimates for the Determinants of Food Security Status among Households in Abia state

Variables	Linear	Semi-log	Double-log	Exponential
Constant	-0.348 (-0.312)	-8.169 (-2.167)*	-9.312 (-4.832)***	-2.412 (-2.844)***
Age (X_1)	0.003 (0.145)	0.306 (0.393)	0.660 (3.350)***	0.013 (1.313)
Educational attainment (X_2)	0.103 (1.098)	0.389 (0.249)	1.206 (2.117)*	0.129 (2.646)***
Monthly income (X_3)	2.130 (4.000)***	0.739 (3.492)***	0.369 (3.405)***	8.95E.007 (1.125)
Household size (X_4)	0.028 (0.300)	0.119 (0.307)	0.108 (0.546)	0.022 (0.449)
Gender of Household head (X_5)	-0.758 (-3.028)***	-0.474 (-1.401)	-0.564 (-1.523)	-0.100 (-0.551)
Dependency ratio (X_6)	0.036 (0.320)	0.180 (0.633)	-0.007 (-0.051)	-0.013 (-0.221)
R^2	0.065	0.204	0.646	0.212
F-ratio	2.515	2.601	5377***	2.736

Note. Figure in parenthesis are t-values; *, ***- denote 10 percent and 1 percent levels of significance respectively.
 Source: Computation from Field Survey Data, 2013.

CONCLUSIONS

The study has shown that there is high income inequality in the study area. The regression results have also shown that, age of the household head, educational attainment of household head and monthly income were the determinants of households' food security status in the study and that majority of the respondents, constituting about 68.57 percent were food insecure in the study area.

-The study recommends that efforts should be made to narrow down or close the gap of income disparities. Efforts should also be made to increase farmers' income. To this end, government policies targeted at farmers should be strengthened. This will in no small way boost farmers' income and thus closing up the gap.

-Employment opportunities should be created in the rural areas. To this end small scale business opportunities should be made

available. This will provide the people the much needed income.

-Enlightenment should be mounted to educate the populace on the cheap but available foods items within their localities. It is very possible that these items exist but due to lack of knowledge, the majority are not aware of it and often times really on expensive food stuffs which they cannot afford.

-Government on its part should try to reduce and stabilize the prices of food items. This will in no small way make them available to the people.

REFERENCES

- [1]Aboyade, O., 1983, *Integrated economics: a study of developing economies*; Addison- Wesley Publishers Ltd.
- [2]Adams, R.H. (Jnr), 1999, *Non-farm income, inequality and land in rural Egypt*. PRMPO/MNSED, unpublished report for comment, World Bank, Washington DC
- [3]Adejare, A.A., 1999, *Impact of soyabean consumption of food sufficiency in Ibadan metropolis*. M.Sc Thesis, Department of Agricultural Economics, University of Ibadan, Nigeria.
- [4]Adenegan, K.O., Oladele, O.I., Ekpo, M.N., 2007, *Impact of Agricultural Export on Food Security in Nigeria*. *Food, Agriculture and Environment* 2(1): 107 – 112.
- [5]Addison, T., Cornia, G.A., 2001, *Income Distribution Policies for Faster Poverty Reduction*. WIDER Discussion Paper No. 2001/93, World Institute for Development Economic Research.
- [6]African Union/New Partnership for African Development (NEPAD), 2006, *Progress Towards the Attainment of 1996 World Food Summit Commitments*. National Position Paper Presented at the African Food Security Summit held at Abuja, Nigeria. December, 4-7.
- [7]Agwu, N.M., 2008, *Comparative Analysis of the Demand for Beef and Chevon among Households in Enugu Metropolis of Enugu State, Nigeria*. *International Journal of Agriculture and Rural Development*, 11(1):61-66.
- [8]Agwu, N.M., 2009, *Economics of Processing Maize into Pap (Akamu) and Maize meal (Agidi) in Enugu State, Nigeria*. *Journal of Sustainable Development*, 6(1): 47-53.
- [9]Agwu, N.M., Nwachukwu, I. N., Okoye, B. C., 2011, *Worsening Food Crisis in Nigeria: A Discourse on Bailout Options*. *Sacha Journal of Environmental Studies*, 1(1):64-68.
- [10]Agwu, N.M., Orji, C. O., 2013, *Empirical Analysis of Income Inequalities and Welfare among Farmers in South Eastern Nigeria*. *Journal of Agricultural Sciences*, 8(1):36-42.
- [11]Aigbohkan, B.E., 1999, *The Impact of Adjustment Policies and Income Distribution in Nigeria: An Empirical Study*. Research Report No. 5. Development Policy Centre, Ibadan, Nigeria.
- [12]Aigbokhan, M.S., 1997, *Poverty Alleviation in Nigeria: Some Macroeconomic Issues*. NES Annual Conference Proceedings. Pp. 181-209.
- [13]Atkinson, A.B., F. Bourguignon, 2000, *Introduction: Income Distribution and Economics*. In A.B. Atkinson and F. Bourguignon (eds). *Handbook of Income Distribution*, Vol. 1, North Holland: Amsterdam.
- [14]Babatunde, R.O., Omotesho, O.A., Sholotan, O.S., 2007, *Socio-economic Characteristics and Food Security Status of Farming Households in Kwara State, North Central, Nigeria*, *Pakistan Journal of Nutrition* 6(1): 49 – 58.
- [15]Babatunde, R.O., 2008, *Income Inequality in Rural Nigeria: Evidence from Farming Households Survey Data*. *Australian Journal of Basic and Applied Sciences*, 2 (1):134 –140.
- [16]Clarke, G.L., Colin, X., Zou, H., 2003, *Finance and Inequality: Test of Alternative Theories*. World Bank Policy Research Working Paper 2984. Washington DC. World Bank
- [17]Dillon, J.L., Hardaker, J.B., 1993, *Farm Management Research for Small Farmer Development*. Rome: FAO
- [18]Ipinnaiye, A.O., 2001, *A Decomposition Analysis of the Sources of Income Inequality in Ibadan Metropolis*. Unpublished B.Sc Project, Department of Agricultural Economics, University of Ibadan.
- [19]Jacobson, A., Milman, A.D., Kammen, D.M., 2007, *Letting the (energy) Gini out of the Bottle: Lorenz Curves of Cumulative Electricity Consumption and Gini coefficients as Metrice of Energy Distribution and Equity*. *Energy Policy* 33:1825 – 1832
- [20]Kolenikov, S ., Shorrocks, A., 2003,. *A Decomposition Analysis of Regional Poverty in Russia*. Discussion Paper No. 2003/74. World Institute for Development Economic Research (UNU/WIDER), Helsinki.
- [21]Lapriorea, C., Muehlhoff B. E., 2005, *Food Security and Nutrition Trend in West Africa Challenges and Way Forward*. Theme. *Improving the year-round Availability of Nutritionally Adequate, Safe and Affordable Food Supplies at National and Community levels*. International Workshop Food-Based Approaches for a Healthy Nutrition, Quagadougou. Nov. 23-28.
- [22]Matlon, P., 1979, *Income Distribution among Farmers in Northern Nigeria: Empirical Result and Policy Implications*. African Rural Economy Paper No. 18. East Lansing, Mich, USA: Michigan State University.
- [23]National Bureau of Statistics, 2003, *Poverty Profile for Nigeria*; Abuja: National Bureau of statistics.
- [24]NDHS, 2003, *National Demographic and Health Survey (NDHS) for Nigeria calvaton, Md, United States: National Population Commission and ORC/Macro*

[25]National Population Commission, 2007, Results of the 2006 Population Census. National Population Commission, Abuja, Nigeria, 2007

[26]Okunmadena, F., 2001, Poverty Reduction in Nigeria: A Four Point Agenda. Annual Guest Lecture of the House, University of Ibadan, Ibadan.

[27]Okunmadewa, F. Y., Yusuf, S.A., Omonona, B.T., 2005, Social Capital and Poverty Reduction in Nigeria. Revised Report Submitted to Africa Economic Research Consortium (AERC) Nairobi, Kenya.

[28]Omonona, B. T., Agoi, G.A., 2007, An Analysis of Food Security Situation among Nigerian Urban Households; Evidence from Lagos State Nigeria. *Journal of Central European Agriculture*, 8(3): 397-406.

[29]Omonona, B. T., Oni, O. A., Akpan, E., 2007, The Determinants of Demand for Nigeria's Agricultural Export Commodities. *Pakistan Journal of Social Sciences*. 4(2), 247 – 251.

[30]Omotor, D.G., 2009, Food Security and Nutrition Trends in Nigeria. Munich Personal REPEC Archive. MPRA Paper No 22669 mpra.ub.uni-muenchen.de/22669.

[31]Oluwatayo, I.B., 2008, Explaining Inequality and Welfare Status of Households in Rural Nigeria: Evidence from Ekiti State. *Humanity and Social Sciences Journal*, 3(1):70-80.

[32]Oyekale, A., Adeoti, A.I., Ogunnupe, T.O., 2006, Measurement and Sources of Income Inequality among Rural and Urban Households in Nigeria, University of Ibadan. PMMA Working Paper No. 2006-20. Retrieved from http://papers.ssrn.com/so13/cf_dev/absbyauth.cfm

[33] Sanusi R.A., Adebukola, B.C., Oyindamola, Y.B., 2006, Measuring Household Food Insecurity in Selected Local Government areas of Lagos and Ibadan, Nigeria. *Pakistan Journal of Nutrition* 5 (1) 62-67

[34]Sewanyana, N.S., Okidi, A.J., Angemi, D., Barungi, V., 2004, Understanding the Determinants of Income Inequality Uganda. CASE Working Papers, 2004-29.

[35]UNU/WIDER, 2000,. United Nations University/ World Institute for Development Economic Research, *World Inequality Database*, Vol. 10, Helsinki.

[36]Waggins, S., Keats, S., 2009,. Current State of Food Security in African and Africa-Eu Partnership on the Millennium Development Goals. A paper for the 2nd Joints Experts Growing Meeting, Africa-EU MDGS Partnership, sub group on priority Action 2: Accelerate the food security targets of the MDGs. Pretoria south Africa. March, 24.

[37]World Bank, 2003, Development indicators for 2002. Washington DC: World Bank. pp. 74-75

