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Size Distribution of Income Among Rice-Based Farming Households in South Eastern States of Nigeria

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Abstract

The study was designed to investigate the income distribution among rice-based farming households in Okigwe Agricultural Zone of Imo State, Nigeria. A sample of 120 rice-based farmers was selected by multistage sampling technique. Data were collected with a well structured questionnaire administered to 120 randomly selected rice farmers. Data collected were analyzed using descriptive statistics and inferential statistics. Gini-coefficient model was also employed. The socio-economic characteristic of the farmers revealed that majority of the farmers were educated. Besides, majority of them also had appreciable experience in rice farming which makes them better rice farmers. It was revealed that income share percentage of the richest households was 17.65% followed by the second richest group with income share percentage of 13.27%. Those in the twelfth decile represented the poorest group with a cumulative share percentage 2.82%. The Gini-coefficient of distribution of 0.32 showed that incomes were not highly concentrated but varied around the low per capita of N1442,859 per household. It becomes imperative therefore to enhance farmers' income through a sustainable improved technology in rice farming.

Keywords:
Income distribution, Rice-based farmers, Gini coefficient, Sustainable.

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INTRODUCTION

Rice is a very important primary food source and this is drawn from the understanding that rice-based systems are essential for food security, poverty alleviation and improved livelihoods by enhancing the status of the farmer (FAO, 2004). It is a staple food and a good source of income for the growers. Rice production occurs in all agro-ecological zones in Nigeria. Hawk Worth (1985) estimated that half the world's population subsists wholly or partially on rice. In the early 60's in Nigeria, the local production of rice was meeting consumption demand but from 1990's till date the decline in local production made demand for rice to exceed supply. This led to an increase in the importation of rice in Nigeria. This situation between 60's and 90's created a serious drain on Nigeria foreign exchange reserve. This also led to an increase in rice production bill from a level of US $60 Million in 1994 to US $160 Million in 2003 (FAO, 2003). As a result of this, majority of rural dwellers have fallen below the poverty line and a greater gap had continued to exist between the rich and the poor. One striking issue was that income levels among rice farming households was considered to be one of the major factors for sustained improved rice production. Meanwhile, in recent years, the introduction of new packages like Fadama projects to Nigerians farmers was expected to bridge the gap between demand and supply of rice but local production has however not been enough to meet the consumption demand of the growing Nigerian populace. One of the reasons for this trend is the issue of rice farmers' return which is becoming very low (CBN, 1997). This however is expected to boost local production of rice for the farmers thereby improving their income sustainably. This therefore, will ultimately reduce the gap in the distribution of income between the rich and the resource poor farmers.

The distribution of a nation's income indicates the proportion of the income that goes to the rich and that which goes to the poor. It also shows that the rich can purchase many, rather than few goods and services. Hence, the more shares a person gets as his/her purchasing power and consumption pattern. The size distribution of income determines how the total income earned by a specified population is distributed among members of that population (Ibekwe and Eze, 2002). The trend of income distribution has been a big concern to economists for a long time (Clarke et. al., 2003). Specifically, the 1990's witnessed an increased empirical attention by economists in the study of income and wealth (Atkinson and Bourguignon, 2000). Their interest became high because it was observed that high incidence of income inequality was unfavorable for political and socio-economic growth. However, previous studies have shown that over the last two decades, income inequality has risen in many developing countries like Cameroun and Nigeria (Kanbour and Lesting, 1999). The rapid economic growth that occurred between 1965 and 1974 in Nigeria was followed by a serious income disparity which has continued to widen substantially (Aigbokan, 1997; Ipinnaye, 2001; Ibekwe, 2001). Despite the past policy intervention to correct the abnormality, the problem has continued to increase among the nation's farming zones (Ibekwe, 2001). One of the aims of agricultural policy is to increase the economic and social standard of living of the farming households. Standard of living implies a broad definition of quality of life of the agricultural population which includes their happiness, utility, income, purchasing power etc (Hills, 1989). Poverty in the form of low income affects households in terms of consumption, production and investment. Poverty however is the lack of income needed to acquire minimum necessities of life (Ibekwe, 2001). It is most damaging where it affects the entire farming zone. Poverty in the form of low income reduces the operation of safety nets for farm households and cuts off entire farming communities from access to benefits of modern developments (Ibekwe, 2001). The widening dimension of income and poverty arouses serious humanitarian concerns and fears of political instability. Despite considerable progress made in recent decades, the world still falls short of the goal of adequate food supply as well as other amenities. Food and agricultural organization (1992), estimated that more than

790 millions of people in the developing countries are chronically undernourished, consuming too little food to meet even minimal energy and protein needs. They therefore advocate equitable, participatory rural development as the key to eradication of poverty. This is the major cause of low income, under nutrition and food insecurity. It also recommends the promotion of rural development that helps to increase the purchasing power of the poor as well as improving the consumption pattern. Since the millennium declaration was adopted in September 2000, the goals and targets it contains have become essential benchmark for assessing development all over the world. Given the importance of meeting the goals, progress towards them must be consistently monitored and particularly aimed at identifying potential problems. This aim is not easily achieved due to uncertainties associated with agriculture especially among rice farmers.

Few researchers have worked on income inequality in the eastern part of the country, hence the relevance of the study. The paper seeks to address the following objectives: to analyze the socio-economic characteristics of the rice farming households and to determine the size distributions in income of rice-based households in the study area. This would lead to the formulation and implementation of policies that would enable them to improve on their performance and productivity such that their income will be enhanced sustainably.

MATERIALS AND METHOD

The study was conducted in Okigwe Agricultural Zone of Imo State. This zone is located on the North Eastern part of Imo State and bounded on the South East by Abia State (Imo Diary, 1992). The topography is flat and gently undulating (MFO, 1999). Okigwe zone was purposively selected, being the main rice farming zone in Imo State. Multistage sampling technique was adopted in the study. First stage involved the purposive selection of two local government areas (based on the highest concentration of rice farmers). Second stage involved the random selection of four communities from the 2 local government areas from which a list of rice farmers was compiled. From this sampling frame, 5 female headed rice farmers and 10 male headed rice farmers were selected using proportionate sampling technique, giving a sample size of 120 respondents. Primary data collection was by a bi-weekly interview with the aid of a questionnaire for a period of 12 months (March 2004 to February 2005). Field workers were trained to keep detailed information on the following; farm labour, inputs, purchases of crops and livestock, transport costs, sales of rice outputs etc. The secondary data were sourced from websites, journal articles and other relevant literature.

Data collected were analyzed using descriptive statistics such as average, percentage, frequency distribution. Also, Gini Coefficient model as specified by Gini, Matlon (1979), Adelman and Morris (1991) as shown below were used to analyze farm income distribution. The income distribution model used is specified as:

A value equal to 0 corresponds with perfect

$$G = \frac{1}{2n^2u} \sum_{i=1}^{n} \sum_{j=1}^{n} \left| Yi - Yj \right|$$

Where,
n = number of observations
U = mean income
Yi = income observation i
Yj = income observation of all other observations

equality while 1 corresponds with perfect inequality (Matlon, 1979).

RESULTS AND DISCUSSION

Socio-economic characteristics of the farmers

Table 1 showed that 7.5% of male headed households and 25% of female headed households had no formal education, this are likely to be those who are advanced in age. Secondary education has the highest percentage for male headed households (53.75%) and female headed households had (42.50%). Tertiary institution had (21.25%) for males and 12.50 for female headed households. The implication is that farmers in the area are educated. This is likely to influence the adoption behavior of the farmers

Table 1: Socio-economic characteristics of the respondents

Characteristics	Male-headed		Female-headed	
	Frequency	Percentage	Frequency	Percentage
Educational level				
0	6	7.50	10	25.00
1-6	14	17.50	7	20.00
7-12	43	53.75	17	42.50
Above 12	17	21.25	6	12.50
Age				
25-39	18	22.50	12	30.00
40-54	37	46.25	18	45.00
55-69	15	18.75	7	17.50
70 and above	10	12.50	3	7.50
Farming experience				
1-5	19	23.75	13	32.50
6-11	16	20.00	11	27.50
12-17	9	11.25	12	30.00
18-23	21	26.25	3	7.50
24 and above	15	18.75	1	2.50
Farm size (Ha)				
0.20-1.59	26	32.50	23	57.50
1.6-2.90	35	43.75	8	20.00
3.0-4.39	10	12.50	5	10.00
4.40-5.79	7	8.75	4	-
5.8 and above	2	2.50	-	-

positively which has a strong bearing on the income and investment of the farmers. Education contributes to increase earning from agriculture and non-agricultural wage employment (Escobal, 2001).

Table 1 also showed that the mean age of the farmers fell within the productive age range of 40 – 54 years indicating that majority of the respondents were middle aged farmers who were still active, vibrant and dynamic and are more likely to adopt innovations better and faster than their elderly counterparts. Age range of (31-50 years) is innovative, motivated and active individuals. The table further revealed that the respondents were reasonably experienced in rice production as mean years of experience in rice production were 19 years. It is expected that the longer a person is in a business, the more skilled and experienced he becomes in its management. Although the males had more years of experience, majority of the male headed households had farm size of (43.75%) and female (57.50%) fell within the range of 0.2 to 2.9ha. This is attributed to the land tenure system obtainable in the state. This has a serious effect on mechanized farming (Idiong 2007) and also has an indirect effect on their income.

The Size Distribution of Income

The size distribution of income determines how the total income earned by a specified population is distributed among members of that population. This size distribution is normally shown by disaggregating the total income into deciles (Ahearn, et al., 1985). The individual units are first ranked in ascending or descending order of income and then put into deciles with each decile consisting often 10 households. Here the entire sample population is said to be ranked in order of degree of income concentration (Miguel and Centeno, 2003; Ibekwe, 2001). The size distribution of aggregate income by

household population decile is presented in table 2.

Table 2 shows the average income of 10 households in each decile with the corresponding cumulative percentage of income. Each decile consist of 10 households with the richest households represented in the first decile and the poorest in the twelfth decile. The table shows that income share percentage of the richest households was 17.65% followed by the second richest group with income share percentage of 13.27%. Those in the twelfth decile represented the poorest group with a cumulative share percentage 2.82%. Comparatively speaking, when the structure of income distribution is inequitable, it takes different forms depending on the study in question. It is also worthy to note that that fact that the richest decile has a large share does not necessarily mean that the poorest household and the richest household was found to be1:6. The ratio between the average income of groups at the top and bottom of income distribution also served to illustrate the wide disparity in access to monetary resources in the study area. Incomes were not highly concentrated but varied around the low per capita of N1,442,859 per household. This finding is consistent with what is obtainable in a population whose mean income do not greatly exceed the subsistence level (Ibekwe, 2001). According to Miguel and Centeno, 2003, the relative income level percentile shows the relative income levels of households at certain percentiles or fraction (for instance two – third) compared to the median income. By taking a fraction of the average as a relative threshold, instead of the average itself, it is also possible to determine the relative poverty or the approximate proportion of the population whose income does not afford them access to goods regarded as essential in the society (Lipton, 2001). This cumulative proportion below the percentile of the median income provides a useful information on the incidence of low income (ECLAC, 2003). The percentage of people whose income falls short of a given relative threshold such as median income also helps to illustrate the pattern of income. The Gini-coefficient of distribution of 0.32 was determined. This showed a lower level of income distribution when compared to World Bank determination of income distribution in Nigeria which was 0.45 in 1996. This Gini value of 0.32 showed that income disparity was not wide; therefore it was closely more concentrated. This has implication for income redistribution policy. Income distribution values depend on the area under study as well as the scope. For instance, Matlon (1979) studied income distribution among farmers in Northern Nigeria and found a Gini-coefficient value of 0.28 which was much lower than World Bank (2006) estimated value while Ibekwe (2001) found a ratio of 0.488 for farm households in Orlu agricultural zone of Imo State. This finding is consistent with what is obtainable in a population whose mean income do not greatly exceed the substance level (Aigbokhan, 1997; Ipinnanye 2001; Ibekwe 2001).

Table 2: The distribution of aggregate income by household population deciles

Decile	Income (N)	Income share (percentage)
	726,211.6	17.65
	546,063.8	13.27
	454,963.0	11.06
	408,621.9	9.93
	372,638.6	9.05
	348,342.9	8.47
	299,699.1	7.29
	255,809.7	6.22
	230,699.1	5.61
	192,136.9	4.67
	163,320.8	3.96
	115,852.6	2.82

CONCLUSION

The result from the study showed that there were different levels of income unevenly distributed in the study area. Income levels varied among the entire Okigwe Agricultural zone creating a gap between the rich and the poor. Though the distribution was not very wide, yet it had some policy implication in the area. The distribution of incomes in the study area is important for farm credit support programmes and farm credit recovery. This is relevant for effective poverty alleviation programmes of the Federal and State governments in Nigeria. The socio-economic characteristic of the farmers revealed that majority of the farmers were young, educated had appreciable experience in rice farming which makes them better rice farmers.

RECOMMENDATIONS

In order to improve the income of rice farmers, State Ministry of Agriculture in conjunction with Federal government should encourage the use of new and improved technology in farming to boost yield and income of the farming populace. This way the disparity in income distribution will be reduced. The effect of such policy intervention would depend on the structure of relevant institutions (Research Institutes, State Agricultural Development Programmes). There is also the need for farmers to have increased access to improved and subsidized inputs and credit facilities.

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