Does Income Diversification Reduce Poverty in Rural Households?

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Authors' contributions

This work was carried out in collaboration between both authors. Author NAAE designed the study, wrote the protocol and wrote the first draft of the manuscript. Author GEE managed the literature searches and analyses of the study performed the spectroscopy analysis. Author NAAE managed the experimental process and author GEE identified the species of plant. Both authors read and approved the final manuscript.

Original Research Article

ABSTRACT

A study was conducted to profile poverty in rural households based on income diversification. The effect of diversification of income sources on poverty was investigated. Multistage sampling procedure was employed to select the representative farming households for the study. Survey data from 150 households were obtained with the aid of questionnaire. Data were analyzed quantitatively using the Foster, Greer, Thorbecke FGT) weighted poverty measure. Results showed the non-diversity of income (sources by most farming households. Result of analysis revealed that poverty was negatively related to income diversification as the incidence of poverty was lower for households with diverse income sources whereas poverty gap and squared-poverty gap were higher for households with single income source. The t-value of only one of the decomposed sub-groups was significant ($P<0.1$). Providing enabling environment for meaningful agricultural production through the provision of inputs for rural households to embark on multi-agricultural enterprises would be a sensible policy decision.

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1. INTRODUCTION

Most of the poor in Nigeria are rural based and derive their livelihood majorly from farming as is the case in other developing economies [1,2], [3,4,5,6,7,8]. Although, there is poverty in urban areas of Nigeria, it is increasingly worrisome as reflected in the worsening trend in urban welfare indicators that rural poverty is a much broader issue than urban poverty [2].

The need to increase household income and ensure food security has propelled many rural families to diversify their sources of income. There is increasing diversification of income among households due largely for the desire to increase family income and insure against agricultural production risk [9]. The aim of any poverty reduction strategy is to increase income and improve wellbeing of rural households. But several poverty reduction strategies adopted by the Nigerian Government have not significantly increased income and improved living standards of the rural poor. However, [10] reported that exploiting off-farm opportunities could offer a pathway out of poverty for the rural poor. Several studies by [11,12,13,14,15,9] on livelihood diversification across the developing world have suggested the increasing role of non-farm incomes in poverty reduction. These studies have clearly shown that diversification provides additional source of income and employment while reducing poverty and improving welfare of the rural poor. Income diversification refers to an increase in the number of income sources or the balance among the different sources [16] and [17]. Income diversification is also the changing from subsistence food production to commercial farming [18]. According to [19], income diversification is used to describe enlargement in the importance of non-crop or non-farm income. Finally, [17] defined income diversification as the process of changing from low-value crop production to high-value crops, livestock, and non-farm activities. The first definition of income diversification by however adopted for this study.

A study by [18] which examined broad patterns of income diversification in Asia and Africa documented noted that African Farmers often have highly diversified crop mixes as a strategy to reduce risk associated with weather. In contrast, crop diversity in Asia is associated with farmers diversifying away from rice into higher-value crops and activities, such as horticulture, livestock and aquaculture. [20] studied the relationship between income diversification and household welfare in Zimbabwe. The study measured income diversification with respect to the number of income sources, the shape of non-farm income, and Simpson index of diversity. The study revealed that in rural areas, income diversification sources were more among richer households whereas in the urban areas, the reverse was the case. Findings by [20] also showed that households residing in rural areas with highly variable rainfall were more likely to have a large number of income sources. A study conducted by [19] in arid village in Burkina Faso showed that rural households have very diverse income sources, relying on crop income, livestock income, local non-farm activities and migrant labour in roughly equal proportions. There is paucity of information on the diversification of income sources by households in rural Nigeria. This study therefore attempts to fill this lacuna by empirically profiling poverty based on the decomposition of income diversification by rural households in Akwa Ibom State.

2. METHODOLOGY

2.1 Study Area, Sampling and Data Collection Procedure

This study was carried out in Akwa Ibom State, Southern Nigeria. The state lies between at latitude 4°33' and 5°53' and longitude 7°25' and 8°25' East and occupies a total land areas of 7,246 km^2. The state has an estimated population of about 3.9 million [21], and is bounded to the North by Abia State, to the East by Cross River State, to the West by Rivers State and to the South by the Atlantic Ocean. The state has 31 Local Government Areas and 6 Agricultural Development Project (ADP) Zones comprising Abak, Oron, Ikot Ekpene, Eket, Uyo and Etinan.

The state is in the rainforest zone and has two distinct seasons viz: the rainy and the short dry season. Agriculture in the area is mostly rain fed and annual precipitation ranges from 2000 – 3000mm. Farming is the predominant occupation of most inhabitants in the study area and the crops commonly cultivated include maize, cassava, water-melon, oil palm, yam, cocoyam, fluted pumpkin, water melon, okra, pepper, waterleaf, bitter-leaf, etc. in addition to raising

micro livestock at backyards of most homesteads.

Cross-sectional data from 150 rural farming households were obtained through deep survey in the study location. Data were obtained from farm households with the aid of questionnaire. Data on family income, socio-economic attributes of household heads and farm specific variables were used for this study.

In studying income diversification and poverty reduction, multi-stage sampling procedure was used for selecting the representative families used for this study. First, 3 out of the 6 Agricultural Development Project Zones in the State were selected randomly. Secondly, 5 villages were randomly selected per ADP zone to

sum up to 15 villages. Finally, a total of 10 households were randomly selected to make 150 farming households.

2.2 Analytical Techniques

Many poverty measures exist. These are: The head count ratio or index is otherwise called poverty incidence. This index is useful in testing the effectiveness, overtime, space or sub-group of policies meant to reduce the relative number of poor people. If the percentage of the population who are poor decreases, then poverty is said to reduce and vice versa. A major challenge with the head count ratio is that it does not show the degree of poverty intensity. Further weakness of the head count index is the homogeneity of income/expenditure distribution.
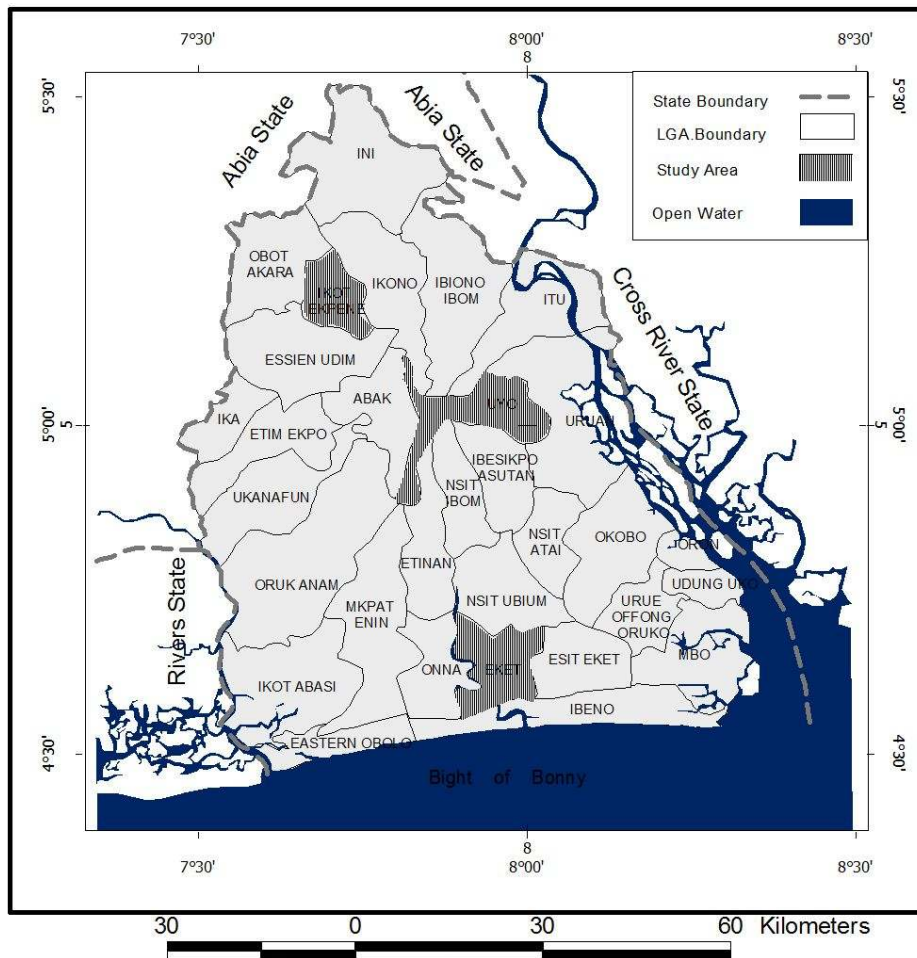
Fig. 1. Akwa Ibom State showing Agric. Devt. project Govt. areas

The poverty gap measure also known as poverty depth is useful in interpreting the average fraction of the poverty-line income which will be needed to be distributed in order to reduce poverty under the perfect targeting assumption. It reveals the extent of immiseration. The weakness of the poverty depth as a measure is that it does not show the severity of the poverty problem in terms of the number of people who are impoverished. It also does not reveal distribution of income among the poor.

A major setback of sen index is being more responsive to improvements in the headcount than reductions in the income gap or to improvements in income distribution among the poor. In order words, sen index is indicative that the efficient way to reduce poverty is to help the least needy first and the most needy last. This is antithetical to egalitarianism.

Foster, Greer and Thorbecke (FGT) weighted poverty index was used to quantitatively assess poverty [22]. The choice of this poverty measure is due to its decomposability of the overall population into mutually exclusive sub-populations which allows for comparison of poverty over the various mutually exclusive sub-groups since according to [23] the most important purpose of a poverty measure is to allow the comparison for poverty. This model was used by [6,7,8] to quantitatively assess poverty in rural households of Nigeria.

The FGT measure for the subgroup $_i$th $P\alpha_i$ is given as:

$$P\alpha_i = n^{-i} \sum_{j=1}^{qi} \left(\frac{z - Yji}{z, O\max} \right)^{\alpha} \quad (1)$$

Where $P\alpha_i$ is the weighted poverty index for the $_i$th subgroup; n_i is the total number of households in the $_i$th subgroup households in poverty; Y_{ji} is the per adult equivalent expenditure of household j in sub group $_{ij}$, z is the poverty line and α is the degree of concern.

When $\alpha = 0$, meaning that there is no concern and the equation gives the head count ratio for the incidence of poverty (the proportion of the farming households that are poor).

That is

$$P\alpha_i = ni^{-1} \sum_{j=1}^{qi} \left(\frac{z - Yji}{z, O\max} \right) = \frac{qi}{ni} \quad (2)$$

When $\alpha = 1$, it implies uniform concern and equation becomes

$$P_{1i} = ni^{-i} \sum_{j=1}^{qi} \left(\frac{z - Yji}{z, O\max} \right)^{1} \quad (3)$$

It measures the depth of poverty (the proportion of expenditure shortfall from the poverty line) according to [24], it is also called the poverty gap that is, the average difference between the income of the poor and the poverty line.

When $\alpha = 2$, distinction is made between the poor and the poorest [22] and [25]. The equation become

$$P_{2i} = ni^{-1} \sum_{j=1}^{qi} \left(\frac{z - Yji}{z, O\max} \right)^{2} \quad (4)$$

The equation gives a distribution sensitive FGT index called the severity of poverty which simply shows the degree expenditure distribution among the poor.

The FGT measure for the whole group or population was obtained using:

$$P_{\alpha} = \sum_{i=1}^{m} \frac{P\alpha_i n_i}{n} \quad (5)$$

Where $P\alpha$ is the weighted poverty index for the entire group, m is the number of subgroups while n and n_i are the total number of households in the whole group and the $_i$th subgroup respectively.

The contribution (C_i) of each subgroups weighted poverty measure to the whole groups weighted poverty measure was estimated using;

$$C_i = \frac{n_i P\alpha_i}{nP\alpha} \quad (6)$$

The test of significance of $P\alpha_i$ (subgroup poverty measure) relative to the $P\alpha$ (whole group poverty measure) was given according to [26] by:

$$t = \frac{P_{\alpha}i - P_{\alpha}}{SE(P_{\alpha}i)} \quad (7)$$

The test described above was used to test if significant difference exist between the $P\alpha$ measure of a subgroup i with another j.

Using the Microsoft Excel Package, the weighted poverty measures (Pα) and their corresponding standard errors were computed.

3. RESULTS AND DISCUSSION

Table 1 shows the type of agricultural enterprise household engage in. The table reveals that 52 percent of farm households were involved in crop production only whereas 8.67 percent were engaged in livestock production only. However, 39.33 percent of the farm households were involved in a combination of crop and livestock enterprise. This suggests that there was diversification into other sources of income.

The decomposition of farm households in terms of agricultural enterprise was based on three types of enterprises identified in the study area.

The incidence of poverty was highest in households where heads engaged only in food crop production and lowest in families whose heads were into food crop, livestock and cash production. Table 2 shows that 50 percent of households whose heads are into food crop production are poor whereas 48 and 40 percent of households whose heads are into both food crop and livestock, and food crop and cash crop

sub-groups are poor respectively. The t-value of one of three sub-groups is significant (p<0.1). This revealed that significant poverty exist (p<0.05) only in households whose heads are into food crop, livestock and cash crops sub-group.

Table 1. Distribution of farm household by type of agricultural enterprise

Agricultural enterprise	Frequency	Percentages
Food crops Production only	78	52.00
Livestock Production only	13	8.67
Food crop, Livestock production and Cash crop	59	39.33

Table 3 revealed that only one out of the three possible sub-group pairs (food crop versus food crops, livestock and cash crop) have significant difference (p<0.01) in between their poverty incidences. This result implies that the type of agricultural enterprise affect the incidence of poverty.

Table 2. Comparison of poverty by type of agricultural enterprise

Type of enterprise	P_o	P_1	P_2	Contribution to		
				P_0	P_1	P_2
Food crops only	0.50 (0.23)	0.44 (0.20)	0.48 (0.10)	0.76	0.75	0.77
Food crops and livestock	0.48 (0.20)	0.43 (-0.08)	0.43 (-0.33)	0.13	0.12	0.13
Food crops, livestock and cash crops	0.40 (-1.64)*	0.38 (-0.50)	0.42 (-0.43)	0.11	0.13	0.10
All	0.57	0.48	0.44	1.00	1.00	1.00

*Figures in parentheses are t-values of p_α *significant at 10%*

Table 3. Poverty by type of agricultural enterprise

Agricultural enterprises	P_o	P_1	P_2
Food crop only Vs food crops and livestock production	0.25	0.03	0.11
Food crop Vs food crops, livestock and cash crops	5.00***	0.16	0.13
Food crop and livestock Vs food crops, livestock and cash crops	1.33	0.50	1.00

***Significant at 1%

In general, poverty is greatest among households whose heads are into food crop production only. This is so because families whose heads are into food crop enterprise only have a higher propensity of output and income risk than households in other sub-groups who combine other enterprises in addition to food crop production. Besides, the food crop producers are worst affected during periods of low prices experienced in harvest peaks.

4. CONCLUSION

An empirical study was conducted to determine the effect of diversification of income sources on the poverty status of households. The Foster, Greer and Thorbecke weighted Poverty index was employed to analyze primary data obtained from 150 farming households. Result of this study showed that households with diversity of income sources were lower in poverty incidence than households with a single income source. Result further revealed that household with diverse income sources also had lower poverty depth and poverty severity.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Khan, MH. Rural Poverty in Developing Countries Implications for Public Policy International Monetary Fund P. 2001;1
2. Etim NA. Analysis of poverty status of rural farm household in Akwa Ibom State, Nigeria. Unpublished Ph. D Dissertation Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria; 2007.
3. Fan S, Sawker A, Shields G. How to mobilize public resources to support poverty reduction 2010 focus brief on the world's poor and hungry people. International Food Policy Research Institute, Washington, D. C; 2007.
4. Edet GE, Etim NA. Factors influencing severe poverty of subsistence farming families of coastal communities in southern Nigeria. British Journal of Applied Science and Technology. 2014;4(13):1966-1977.
5. Etim NA, Edet GE. Factors determining urban poverty of farming household in a tropical region. American Journal of Experimental Agriculture. 2014a;4(3):322-335.
6. Etim NA, Ukoha OO. Analysis of poverty profile of rural households: Evidence from South-South Nigeria. Journal of Agriculture and Social Science. 2010;6(3):48-52.
7. Etim NA, Okon S, Akpabio I. Labour and poverty: Empirical relationship using house data from south Nigeria. International Journal of Agricultural Management and Development. 2011;1(1):53-59.
8. Etim NA, Edet GE. Does asset ownership reduce chronic poverty? European Scientific Journal. 2014b;10(1):168-176.
9. Awotide BA, Awoyemi TT, Diagne A, Kinkingnihoun F, Oje homone V. Effect of Income diversification on poverty reduction and income inequality in rural Nigeria: Evidence from rice farming households. International Journal of Sustainable Development. 2012;5(10):65-78.
10. Barret CB, Readon T, Webb P. Non-farm income diversification and household livelihood strategies in rural African; Concepts, Dynamics and Policy Implications. Food Policy. 2001;26(2):315-331.
11. Marter A. The rural non-farm economy in Uganda. A Review of Policy. NRI Report No. 2702; 2002.
12. Matshe I, Young T. Off-farm labour allocation decision in small-scale rural households in Zimbabwe. Agricultural Economics. 2004;30:175-186.
13. Serra T, Goodwin BK, Featherstone AM. Agricultural policy reform and off-farm labour decisions. Journal of Agricultural Economics. 2005;56(2):271-285.
14. Kijima Y, Matsumoto T, Yamano OT. Non farm employment, agricultural shocks and poverty dynamics: Evidence from rural Uganda. Agricultural Economics. 2006; 35:459-467.
15. Jan P, Robert R, Stephen K, Julian W, Iman S, Nunung N. Rurak income dynamics in post-crisis Indonesia. Mimeo' 2009.
16. Joshi PK, Gulati A, Birthal PS, Tewari L. Agriculture diversification in South Asia. MSSD Discussion Paper. 57. International Food Policy Research Institute, Washington, D.C; 2003.
17. Minot N, Epprech M, Anh TTT, Trung LQ. Income diversification and poverty in the northern uplands of Vietnam. Research Report 145. International Food Policy Research Institute, Washington, DC; 2006.

18. Delgado C, Siamwalla A. Rural economy and farm income diversification in Developing Countries. Discussion paper no. 20. Market and structural Studies Division. Washington DC. International Food Policy Research Institute; 1997.

19. Reardon T, Matlon P, Delgado C. Coping with household level food insecurity in drought affected areas of Burkina Faso. World Development. 1988;16(9):1065-1074.

20. Ersado L. Income diversification in Zimbabwe: Welfare implications from Urban and rural areas. FCND Discussion Paper 152. Washington, D.C International Food policy Research institute; 2003.

21. NPC (National Population Commission). Population Census of the Federal Republic of Nigeria. Report at the National Level, National Population Commission, Abuja; 2006.

22. Foster J, Greer J, Thorbecke E. A class of decomposable poverty measures, Econometrica. 1984;52:761-5.

23. UN (United Nations). Indicators of Sustainable Development Guidelines and Methodologies. New York; 2001.

24. Hall G, Patrinos HA. Latin America's indigenous people. Latin America. A time of transition. Finance and Development. International Monetary Fund. 2005;42(2): 24.

25. Assadzadeh, Aand Paul S. Poverty growth and redistribution. A case study of Iran. In Vander Hoeven R, horrocks A. (Eds.), Perspective on growth and poverty. UNU/WIDER Helsinki, Finland; 2003.

26. Kakwani N. Measuring poverty: Definition and significance est with Application to Cote d'Ivoire. In Lipton, M. & Van der Gaag, J. (eds.), Including the Poor. The World Bank, Washington, DC; 1993.

Peer-review history:
The peer review history for this paper can be accessed here:
http://sciencedomain.org/review-history/17140