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Land and Poverty: Some Empirical Findings Using Cross Sectional Data From Niger Delta Region, Nigeria

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Abstract

Poverty is the most serious threat to natural resources and the environment and most of the poor are rural-based who engage in various agricultural activities. Land is a critical asset for the rural poor and lacking means to appropriately intensify agriculture which compels the poor to either overuse or misuse this natural resource base to meet basic needs. This study presents empirical relationship between land and poverty using Foster, Greer and Thorbecke weighted poverty measure. Through the multi-stage sampling procedure, 150 rural farmers were selected with the aid of questionnaire. The results of poverty decomposition show that the prevalence of poverty is more among the nearly landless farming households. Result of stochastic dominance analysis indicate that poverty incidence is sensitive to changes in poverty lines and there is second order stochastic dominance as poverty depth and severity are robust to the choice of poverty line for this sub-group. Results further suggest that households with little or no access to farmland depend on non-farm income sources for family survival.

Keywords:
Land, poverty, Niger Delta, Nigeria

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INTRODUCTION

The ownership or control of productive assets is an important indicator of livelihood because assets generate income. Land is a vital productive asset in a rural economy (Ahmed *et al*., 2007). Land is also a critical asset for the rural poor and provides a means of livelihood through the consumption and sale of crops, and other products, and in many cases it can serve as collateral for credit or be exchanged for capital to star up another income-generating activity (Meinzen-Dick *et al.*, 2007). Historically and currently, land plays a major role in the livelihoods of the vast majority of rural households. In rural areas, little land is bought and sold, and land rental markets are week. Studies in Sub-Saharan Africa suggest that there are few economies of scale in crop production; rather, small family farms have been found to be more efficient than larger ones (Ahmed *et al*., 2007). Poor households rarely buy bits of land from larger farmers and if anything, the sales of land that are most commonly observed are distress sales made by poor farmers to large farmers in times of hardship and most land is passed from one owner to another through inheritance (Ahmed *et al.*, 2007).

With a growing population and related needs for food, water, and other resources, the rural poor will continue to be disadvantaged in their quest for secure livelihoods. In many developing countries where other economic activities are lacking, land continues to be the main productive, resource, and both the economy and peoples livelihoods heavily depend on agricultural and other natural resources (Meinzen-Dick *et al.*, 2007). But the holding of land may be skewed in favour of some groups, excluding the poor.

In Nigeria, land is relatively abundant, but there are limitations to gaining access to land for productive use. The key factor is the land-tenure system prevailing in different parts of the country. The land-tenure system is the body of laws, contracts and arrangements by which people gain access to land for agriculture and other uses. The land-tenure system in Nigeria varies from one place to another. The prevalent land tenure system has a number of demerits for moving agriculture from subsistence level to market oriented production. The severity of the land tenure problem is more pronounced in the South where land is usually owned by the family and the system of inheritance tends to perpetuate fragmentation of holding among male heirs of land owning families. Population pressure in the south has added to the restrictions imposed by the land ownership pattern and has led to reduced land/person ratio, shortened fallow periods, reduced soil productivity and increasing environmental problems (NEST, 1991). Inheritance leads to land fragmentation among heirs and subsequent uneconomic farm sizes per household member (Onyebinama, 2004; NARP, 1994). This implies that in the region, hectarage of farmland per capita is low and declining in the face of land fragmentation along family lines. However, the size of land per capita in the area depends ultimately on population pressure, the amount of land available to each household and the specifics of the inherence law in each community. In the North, the lack of ownership rights (land belongs to the community) creates a disincentive for long term investments. The communal system of land ownership, in which individual ownership of land is embedded in group or kinship ownership, prevails among most ethnic groups in the South (Onyebinama, 2004; Philip, 2009). A few significant factors have promoted individual land ownership, especially in Southern Nigeria. Increase in population pressure has raised land values and has created incentives to sell portions of lands. Demand for land for non-agricultural uses (especially industrial and residential developments) has also been a factor, and some land owners have disposed of urban and peri-urban lands for fear that government might take over these parcels under the Land Use Act Provisions (Onyebinama, 2004; Philip, 2009). The study provides some empirical findings by comparing land and poverty among farming households in Niger Delta, Nigeria, using cross sectional data set.

The concept of poverty dates back to 1899, when one of the earliest and most famous studies of poverty was conducted by Seebohm Rowntree in York. He used a concept of subsistence poverty and drew a poverty line in terms of a minimum weekly of sum of money, which was necessary to enable families secure the necessaries

of a health life. According to Okunmadewa (2001), poverty is more easily recognized than defined. Hence, a universally acceptable definition of the term has remained elusive. Poverty is defined as total poverty as the expectation overtime of the poverty measured at each point in time. Poverty can be chronic (structural) or transitory, depending on how long poverty is expressed by an individual or a community. Chronic poverty is long term, persistent, the causes of which are largely structural and endemic, while transitory poverty is temporary, transient and short term in nature. Transitory poverty is defined as total poverty minus chronic poverty. Since the nineteenth century when rigorous studies in poverty began researchers have tried to establish fixed yardsticks against, which to measure poverty ideally, such a yardstick would be applicable to all societies and should establish a fixed level, usually known as the poverty line below; which poverty begins and above which it ends. A traditional measure of poverty stipulates that the number of people living on less than US$1 per day. Although this traditional measure of poverty is commonly used, many in the development community have supported measures such as Millennium Development Goals (MDGs) that use a complex set of conditions as yardsticks in assessing the entire living situation of poor people (Rosegrant *et al*., 2005). Absolute poverty is a situation of lack of access to resources required to obtain the minimum necessities required to maintain physical efficiency. Relative poverty, on the other hand, is the inability to attain a given minimum contemporary standard of living. Poverty can also be subjective. This refers to whether or not individuals or groups feel they are poor. Subjective poverty is closely related to relative poverty since those who are defined as poor in terms of standard of the day will probably see and feel themselves to be poor. The concept of subjective poverty is important since to degree, people act in terms of the way they perceive and define themselves. Poverty line is the threshold income below, which one is considered to be poor (Kakwani, 1993). It is the value of income or consumption expenditure necessary for a minimum standard of nutrition and other necessities.

The literature on aggregate measures of poverty and wellbeing is quite enormous. Many indices have been designed and developed to measure poverty and well-being. These comprise Sen index (1979); Foster-Greer-Thorbecke (FGT) poverty index (1984); UNDP (1990), Integrated Poverty Index (IPI), Basic needs on balanced diet index, the Physical Quality of Life (PQLI) (Morris, 1994), Relative Welfare Index (IFAD, 1993), Index of Social Progress (Estes' 1984); Index of "Quality of Life" in nations (Slotje's 1991); Index of Quality of Life in metropolitan areas (Lui's 1977). This study however employs the Foster, Greer, Thorbecke weighted poverty measure for quantitative poverty assessment. This class of additively decomposable poverty measure is based on income/expenditure approach.

MATERIALS AND METHODS

Study Area, Sampling and Data Collection Procedure

This study was conducted in Akwa Ibom State, Niger Delta, Nigeria. The state is located at latitude 40331 and 50531 and longitude 70251 and 80251 East and occupies a total land areas of 7,246km^2. With an estimated population of about 3.9 million (NPC, 2006), the state 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. Administratively, the state is divided into 31 Local Government Areas and has 6 Agricultural Development Project (ADP) Zones viz: Oron, Abak, Ikot Ekpene, Etinan, Eket and Uyo.

The study area is in the rainforest zone and has two distinct seasons viz: the rainy and the short dry season. The annual precipitation ranges from 2000 – 3000mm per annum. Most of the inhabitants of rural communities in the study area are farmers and the crops commonly cultivated include cassava, oil palm, yam, cocoyam, fluted pumpkin, okra, waterleaf, bitter-leaf, etc. In addition, some micro livestock are usually raised at backyards of most homesteads.

Primary data were used for this study. Farm-level intensive itinerary survey provided the basic cross-sectional data from 150 rural farming households in the study area. Data were collected from farm households using well structured questionnaire.

Primary data included data on household income and expenditure, socio-economic characteristics of households and their heads, farm, specific variables.

Multistage sampling technique was used for selecting the representative farm households that were used for this study. The first stage was the random selection of 3 out of the 6 Agricultural Development Project Zones in Akwa Ibom State. The second stage sampling was the random selection of 5 villages per ADP zone to make a total of 15 villages. Furthermore, a total of 10 households were randomly selected to make a total of 150 farming households.

Analytical Techniques

There are many poverty measures. The head count ratio or index is otherwise called poverty incidence. This type of application would be useful in testing the effectiveness, overtime, space or sub-group of policies intended to alleviate the relative number of poor people. If the percentage of the population in poverty decreases, then poverty is said to decline and vice versa. A major problem with the head count ratio is that it does not indicate the extent of poverty intensity. Another short coming of the head count index is that it implies that the distribution of income/expenditure is homogenous.

The poverty gap measure otherwise called poverty depth has a useful interpretation as the average fraction of the poverty-line income that would be required to be distributed in order to eradicate poverty under the assumption of perfect targeting. It shows the degree of immiseration. The short fall of the poverty depth as a measure is that it does not indicate the severity of the poverty problem in terms of the number of people who suffer. It also does not show income distribution among the poor.

The sen index has a major draw back: it is more responsive to improvements in the head-count than it is to reductions in the income gap or to improvements in the distribution of income among the poor. That is, the index indicates that the efficient way to reduce poverty is to help the least needy first and the most needy last. This is antithetical to egalitarianism.

The Foster, Greer and Thorbecke (FGT) weighted poverty index was used for the quantitative poverty assessment (Foster *et al*., 1984). The reason for this choice is due to its decomposability of the overall population into mutually exclusive sub-populations. This allows for comparison of poverty over the various mutually exclusive sub-groups. United Nations UN (2001) noted that the most important purpose of a poverty measure is to enable poverty comparisons.

The FGT measure for the subgroup ith $P\alpha_i$ 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 ith subgroup; ni is the total number of households in the ith subgroup households in poverty; *Yji* 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 α is equal to zero, it implies no concern and the equation gives the head count ratio for the incidence of poverty (the proportion of the farming households that are poor).

The poverty line used for this study is defined as the two-thirds of mean household expenditure adult equivalent. Adult equivalents were generated following Nathan and Lawrence (2005) as follows:

$$AE = 1 + 0.7\ (N1 - 1) + 0.5N_2 \quad (2)$$

Where AE = Adult Equivalent

N_1 = Number of adults aged 15 and above

N_2 = Number of children aged less than 15

That is

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

When α is equal to 1, it shows uniform concern and the equation becomes

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

This measures the depth of poverty (the proportion of expenditure shortfall from the poverty line) according to Hall and Patrinos (2005), it is otherwise called the poverty gap the average difference between the income of the poor and the poverty line.

When is equal to 2, distinction is made between the poor and the poorest (Foster *et al.*, 1984; Assadzadeh and Paul, 2003). The equation become

$$P_{2i} = ni^{-1}\sum_{j=1}^{qi}\left(\frac{z - Yji}{z, O\max}\right)^2 \quad (5)$$

The equation gives a distribution sensitive FGT index called the severity of poverty. It tells us the extent of the distribution of expenditure among the poor.

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

$$P_\alpha = \sum_{i=1}^{m}\frac{P\alpha_i n_i}{n} \quad (6)$$

Where Pα is the weighted poverty index for the whole group, m is the number of subgroups while n and ni are the total number of households in the whole group and the ith subgroup respectively.

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

$$C_i = \frac{n_i P\alpha_i}{nP\alpha} \quad (7)$$

The test of significance of $P\alpha_i$ (subgroup poverty measure) relative to the Pα (whole group poverty measure) was given according to Kakwani (1993) by:

$$t = \frac{P_\alpha i - P_\alpha}{SE(P_\alpha i)} \quad (8)$$

The above was used to test if significant difference exist between the Pα measure of a subgroup *i* with another *j*.

The weighted poverty measures (Pα) and their corresponding standard errors were calculated using the Microsoft Excel Package.

The stochastic dominance analysis was used to test the robustness of poverty to small changes in the location of the poverty line.

RESULTS AND DISCUSION

The first step in the analysis of poverty is the determination of the poverty line. As stated in the methodology, the mean household expenditure adult equivalent was used to determine this threshold. Table 1 shows the average amount expended on basic consumption items of the households. The mean per adult equivalent household expenditure is ₦1,652.82 and the poverty line is ₦1,101.88.

The dominant means of access to farmlands in Akwa Ibom State, Nigeria are inheritance, rent and purchase as shown in table 2.

Results on Table 2 reveal that majority of the farm households (58.67 percent) accessed land by inheritance, 24.67 percent purchased land for cultivation and 13.33 percent acquired land through lease. However, only 3.33 percent of the farm households acquired land through gifts. The fact that most households inherited their farmlands implies that most land available for agricultural production were in small holdings due to the prevailing tenural arrangement in the area which encourages land fragmentation into small holdings.

Table 1: Mean household expenditure (Adult Equivalent)

Item	Amount (₦) per month	Percentage Expenditure
Energy	1677.34	20.30
Clothing	1201.30	14.54
Health Care/Medication	1134.34	13.73
Education	2107.00	25.50
Food	2144.11	25.93
Total	**8264.09**	**100.00**

Mean 1652.82

2/3 1,101.88 (poverty line)

Table 2: Means of access to farmland

Access to Farmland	Frequency	Percentage
Inheritance	88	58.67
Purchase	37	24.67
Leased	20	13.33
Gift	5	3.33
Total	**150**	**100**

Table 3: Distribution of farm households by farm size

Farm Size (Hectares)	Frequency	Percentage
0.1 – 1.0	68	45.33
1.1 – 2.0	57	38
2.1 – 4.0	25	16.67
Total	**150**	**100.00**

Table 4: Comparison of poverty by farm size

Farm Size (Hectares)	P0	P1	P2	Contribution		
				P0	P1	P2
0.1 – 1.0	0.52 (0.63)	0.56 (0.13)	0.67 (1.58)	0.32	0.37	0.42
1.1 – 2.0	0.51 (0.67)	0.46 (0.03)	0.49 (0.01)	0.44	0.43	0.42
2.1 – 4.0	0.42 (0.63)	0.30 (-0.22)	0.27 (-1.31)	0.24	0.20	0.16
All	0.57	0.48	0.44	1.00	1.00	1.00

Figures in parentheses are t-values of Pα

Table 3 reveals that 45.33 percent of the farm households in the study area had less than 1 hectare of farmland under cultivation whereas 38 percent of farm households cultivated between 1.1–2.0 hectares of land. However, farming households cultivating between 2.1–4.0 hectares of farmland constitute only 16.67 percent. Result implies that most of households own small sizes of farmland. Findings are synonymous with NARP (1994) that more than 70 percent of the farming population in Nigeria consists of small holder farmers, each of whom owns or cultivates less than 5 hectares of farmland. This may be attributable to the prevalent tenural system in the study area which tends to perpetuate fragmentation of holdings among male heirs of land owning families.

Three farm sizes subgroups were used to profile poverty. These include farms between 0.1–1.0 hectare, 1.1–2.0 hectares and 2.1– 4.0 hectares. The table reveals that poverty was highest (52 percent) among farm households with less than 1 hectare are in poverty and they contribute 32 percent to whole group's poverty incidence. Results confirm earlier findings in Bangladesh by Meinzen-Dick *et al.*, (2007) that landless and nearly landless (with less than 0.2 hectares) make up two-thirds of the poor. Fifty-one percent and 42 percent of farm households with 1.1–2.0 and 2.1–4.0 hectares were poor, whereas 46 percent of farm households with 1.1– 2.0 hectarages had their expenditure shortfall from the poverty line, 27 percent were the poorest of the poor for households that had 2.1–4.0 hectares of farmland. However, the t-values of the poverty incidence are not statistically significant in all the subgroups. Table 5 shows the differences in poverty incidence is statistically significant ($P<0.01$) among 2 of the possible pairs of the sub-groups (1.1– 2.0 hectares versus above 2.1– 4.0 hectares). This implies that farm size affects the incidence of poverty. Findings agree with evidence from earlier studies in South Asia, have to 40 percent of the worlds poor, by Meinzen-Dick *et al*. (2007) show that poverty is strongly associated with landlessness and insecure access to land.

Table 5: Poverty by farm size

Farm Size (Hectares)	P0	P1	P2
1.1 vs 1.2	0.50	0.42	-0.26
0.1 – 1.0 vs 2.1 – 4.0	0.13	1.04	-0.7
1.1 – 2.0 vs. 2.1 – 4.0	4.50***	1.60	1.69**

*** P < 0.01 ** P < 0.1

From the table, 12.67 percent of the farm households earned more than ₦50,000 as farming income per season while 46 percent earned between ₦10,000 to ₦50,000 as farming income per season. Farm households earning farming income less than ₦10,000 are 41.33 percent. The fact that most (87.33 percent) of the farm households earned less than ₦50,000 from farming activities suggest that farmers were involved in other economic ventures in order to augment income accruable from farming.

On the basis of farm income, households were classified into 4 sub-groups. These are households that earn less than N10,000 per season, ₦10,000

Table 6: Distribution of farm households by farm income

Farm Income (₦)	Frequency	Percentage
<10,000	62	41.33
10,000 – 50,000	69	46
50,001 – 100,000	12	8
>100,000	7	4.67
Total	**150**	**100**

* ₦ is Naira, Nigerian currency. To convert to US $ divide by 162

Table 7: Comparison of poverty by farm income (N)

Farm Income (₦'000)	P0	P1	P2	Contribution to		
				P0	P1	P2
1 – 10	0.52 (0.50)	0.45 (0.01)	0.51 (0.16)	0.39	0.38	0.36
10 – 50	0.50 (0.42)	0.44 (0.53)	0.49 (0.01)	0.33	0.34	0.32
50 – 100	0.48 (0.14)	0.43 (-0.01)	0.46 (-0.02)	0.18	0.17	0.12
100 – 150	0.47 (0.27)	0.42 (0.14)	0.44 (0.00)	0.10	0.11	0.10
All	0.57	0.48	0.44	1.00	1.00	1.00

Figures in parenthesis are t-values of Pα
₦ is Naira, Nigerian currency. To convert to US$ divide by 162

– ₦50,000, ₦50,001 – ₦100,000 and above N100,000 per season as shown in table 7. The analysis of the incidence of poverty reveal that 52, 50, 48 and 47 percent of farm households are respectively. And, they contribute 39, 33, 18 and 10 percent each to whole group's poverty incidence. Only the poverty severity of the households having above ₦100,000 farm income is significantly different ($p<0.01$) from that of the whole group. A test of the difference in the poverty incidence between all the possible pairs of the sub-group shows that only two of the six possible pairs (less than ₦10,000 versus above ₦100,000 and ₦10,000 – N50,000 versus ₦50,001 – ₦100,000) are significant ($p<0.10$) see table 8. This means that farm income influences poverty incidence. However, none of the t-values of the sub-groups poverty incidence and depth is significantly different from that of the whole group. The difference between the poverty depth and severity of all the possible pairs of the sub-groups are not significant as seen in Table 8. In general, the level of poverty decreases as the farm income increases. This may be attributable to the fact that increase in income raises consumption which leads to improved welfare.

In the analysis of the stochastic dominance, four other poverty lines were specified which are multiples of the poverty line. These multiples are 0.4, 0.6, 0.8, 1.0 and 1.2. The results of this analysis are presented below.

Figure 1 shows that there are intersections among the cumulative distribution function (CDF) of households cultivating less than 1 hectare, 1-2 hectares and above 2 hectares. Hence, the poverty incidence is sensitive to changes in poverty line. The poverty deficit curves as shown in figure 2 show that there is second order stochastic dominance. This implies that the poverty depth and severity are highest among households cultivating less than 1 hectare. It is followed in that order by households cultivating 1-2 hectares and above 2 hectares. Hence poverty depth and severity are robust to the choice of poverty line for this sub-group.

CONCLUSION

The results of this study indicate that poverty is strongly associated with landlessness and insecure access to land and the prevalence of poverty is were among the nearly landless (with less than 0.1 hectare). Findings suggest that most farmers with little or no access to farmland depend on employment from other farmers or non-farm income

Table 8: Poverty by farm income

Farm Income (₦'000)	P0	P1	P2
10 vs 10 – 50	0.67	-0.05	-0.02
10 vs 50 – 100	1.00	0.03	-0.08
10 vs 100 – 150	1.67*	0.50	0.78
10 - 50 vs 50 - 100	2.00**	0.01	0.30
10 – 50 vs 100 - 150	-0.50	0.07	0.06
50 – 100 vs 100 – 150	-0.14	0.02	0.03

** P< 0.0 5 *P< 0.1

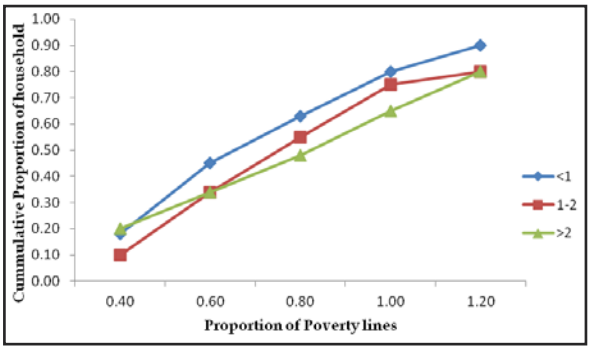

Figure 1: CDFs of individual PAEE by farm size

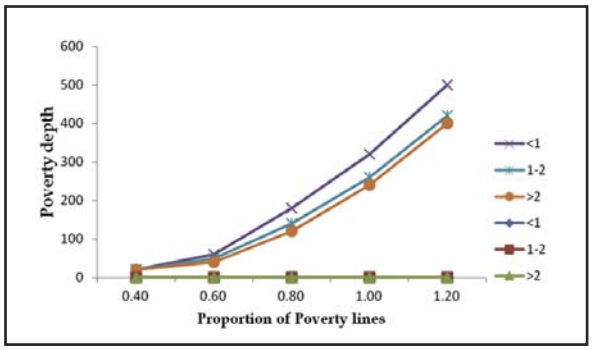

Figure 2: Poverty deficit curve by farm size

sources. These results calls for policies designed to improve farmers' access especially women to more land for meaningful agricultural production.

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