Research article

Assessment of Standard of Living of Smallholder Agroforest-based Farming Households in the Rain Forest Belt of Delta State, Nigeria

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Abstract

The people in the rain forest belt of Delta state are mainly smallholder farmers. It is important to determine their welfare level for the purpose of intervention. This study assesses the standard of living of smallholder farming households in the rain forest belt of Delta State, Nigeria. A total of 70 agroforest-based farmers were randomly selected and studied. Primary data were collected with structured questionnaire. Data collected were analyzed using descriptive statistics, logistic model, student t-test. The Foster Greer and Thorbecke approach were used to measure the poverty incidence. The result of the study. shows that there is significant difference in the standard of living of male and female headed households. The results further show that the poverty incidence was 97%, with 57% of the households being women living below the standard of living threshold while 40% were men. This finding indicates that income and wealth were unevenly distributed and biased towards male headed households. Furthermore, the study revealed that the household with per capita expenditure of less than ₦6,528.81 are classified as being moderately poor. While those with per capita expenditure less than ₦3,261.90 are considered as extremely poor. The standard of living shortfall is ₦3,262. The study shows that poverty incidence among farming household heads in the study area was influenced by social and economic factors such as income, household size, educational attainment, rurality, farm size and credit accessibility. **Copyright © WJAERD, all rights reserved.**

KEYWORDS: standard of living, poverty, agroforest-based farmers, smallholders, rain forest belt.
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1. Introduction

Despite the impressive effort made in development, inequality still characterize the pattern of economic development in most parts of the world. A substantial proportion of the world's population remains in poverty and the gap between the richest and the poorest group continue to widen. One of the global millennium development goal is to eradicate extreme poverty and hunger.

The World Bank (1996) characterized poverty as overwhelmingly rural and regional in outlook. According to the report, the total number of people in poverty as at 1992 was 34.7million with about two third of this coming from rural areas. World Bank (1994) identified decline in the world oil price as a major factor. Consequent upon this, the per capita income which stood at $1000 in 1980 fell to a low of $340 in 1992. This has fallen to $260 as at 1995. Perhaps introduction of the Structural Adjustment Program in July 1986 led to unintended effects for instance, the devaluation of the Naira snowballed into eroded purchasing power of the people. This is further aggravated by spiraling inflation which stood at about 73percent in 1995. (CBN, 1996).

Poverty implies a condition in which individuals have little to eat, limited materials to wear aid very rudimentary shelter to live in. There is corollary that the poor person have access to little or no means of recreation and tourism (Akinbode, 1991). Singh and Hazell (1989), in analyzing various aspects of poverty, list three important indicators from which a poor household can be easily identified, this include size of land owned by the rural household, the residential buildings and level of education.

The quest for household development in Nigeria has been a preoccupation of both academics and policy makers A household is an established, domestic family unit. It is the smallest economic unit. in Africa, a household involves those who are held together in the same house and compose a family (National population census, 1991). According to Lele and Adu Nyako (1991), the decline in household living standard experienced in most African countries including Nigeria is predominantly a research issue of concern.

According to a demography survey of the National Planning Commission (1996), female headed household constitute 23% in the south-east Nigeria. This empirical data implies that many Nigeria women at least l6million of them (Ogbene 1998), spear head household economy in both rural and urban centers. Women who assume household headship position in Nigeria include women with handicapped husbands, widows, divorce women and unmarried mothers. Thus circumstances beyond their control enforce the headship that women household on them. Batie (1992) observed keenly that women household bear the burden of catering for their handicapped husbands (whether physically or financially), their children and wards. The poor women household heads usually belong to lower class, who have no right over inherited land. Women household head who are displaced from their farms by oil spillage constitute up to 35% of agricultural work force. They are faced with acute shortage of production resources. They respond by intensifying and over exploiting available natural resources, since they must ensure survival of their households.

The worsening standard of living has inspired studies into poverty situation in Nigeria. Studies has shown that poverty exist both at rural and urban level (World bank, 1993, Adeleke 1995, Durojaiye 1995, and World Bank 1996). In the study of Ogwumike (2001), both incidence and depth of poverty were higher in rural than urban area.

Hence there is the need to study the poverty gap among households in the rain forest belt of Delta state. Unequal access to land tenure, education, extension services, technology and credits has led to inequalities in farm income and standard of living among different male and female household heads in sub-Sahara Africa, including Nigeria. Hooder and Lee (1974) reported that income inequality especially to the disadvantages of women farmers is a clear signal of poverty. Hence women household heads are caught in the vicious cycle of poor socio-economic status. There is therefore the need for an empirical study that will come up with an intervention programme that is capable of lifting them out of poverty trap.

Since agricultural growth and development depend upon the decision and action of the farm household heads, the poverty gap between male and female headed household requires thorough investigation. Avialble the information on women welfare is not sufficiently utilized as a tool by economic planner and decision makers. Thus statistics obtained from this study will serve useful purpose for researchers, academicians and women's group who are interested in socio-economic development of the agrarian sector. A development model is therefore warranted to correct the lapses and inequality that may exist between the male and female household heads in the study instead of predicating development mechanism on mere intuition.

The result of this study will contribute to existing body of literature on the subject matter. The study will be of immense value to those who may carrying out similar research in the future. The suggestion made will also help policy makers and development agents to put up intervention programmes that will enhance the welfare and potentials of women for agricultural production.

The main objectives of this research are to estimate the poverty gap between female and male headed faming households in the rain forest belt of Delta State.

The specific objectives are to:

   i.   measure the poverty gap between female and male headed household in the study area.

  ii.   determine and compare the poverty incidence, depth and severity among male and female household heads.

 iii.   identify and analyze the determinants of poverty incidence among household heads in the study area.

This study was guided with the following hypotheses.

1.   Ho: There is no significant gap between the poverty levels of male and female farming household heads in the study area.

2.   Ho: The selected socio-economic variables do not significantly determine standard of living among farming household in the study area.

2. Methodology

2.1   Area of Study and Sampling Procedure

The rain forest belt of Delta State was the study area. The major occupations of the indigenes in the area are farming, transportation, petty trading and non farm activities such as food processing and vocational jobs. From each of the 7 extension cells, simple random sampling was done to select 10 agroforest-based farmers. This gave a total of 70 respondents that were selected and studied. Structured questionnaire was administered to the selects farmers with a view of collecting relevant standard of living information.

2.2 Method of Data Collection

In the course of this study, primary and secondary data were used for collection. The primary data was collected with the use of interview schedule and structured questionnaires. The questionnaires were used to elicit information on the socio- economic characteristics. The secondary data were obtained from journals, periodicals and conference materials e.t.c.

2.3 Method of Data Analysis

Analysis of data involves the use of descriptive statistica1 tools such as the use of tables, means, percentages, T-test and Poverty measure using Foster Greer and Thorbecke (1984) were used to estimate the incidence, dept and severity of poverty in the study area.

    i.   T-test

This is given by the formula

$$T = \frac{x - y}{\sqrt{\dfrac{SDx^2}{Nx-1} + \dfrac{SDy^2}{Ny-1}}}$$

Where

x	=	Mean of data for x group (female headed household)
y	=	Mean of data for y group (male headed household)
SDX^2	=	Variance of x group
SDy^2	=	Variance of y group
Nx	=	Number of subjects in x group
Ny	=	Number of subjects in y group

ii   The poverty line among the members of the population was derived from the mean per capita expenditure (MPCH.HED) approach as follows:

$$\text{Per capita expenditure} = \frac{\text{Total Household Monthly Expenditure}}{\text{Household size}}$$

The mean per capita expenditure (MPCHHED) for all respondents was given as

$$\text{MPCHHE} = \frac{\text{Total per capital expenditure for all household}}{\text{Total number of household}}$$

Three naturally exclusive classes were obtained from the MPCHHTE which are:

1. A core poverty line equivalent to one third of MPCHHE.

ii. The moderate poverty line equivalent to two third of the MPCHHIE.

iii. The non-poor.

The poverty incidence was measure using Foster Greer and Thorhecke (1984)\approach/

The FGT measure is given mathematically as follows;

$$P_\infty = 1 \sum_{i=1}^{q} \left[\frac{Z-Y}{2} \right] \quad \dots\dots\dots\dots\dots\dots\dots \infty \geq 0$$

Y1   =   per capita household expenditure

Z   =   poverty line

n   =   Total population

q   =   Number of poor

This is simply proportion of the poor to the total population (.i.e. head count ratio).

$$P0 \quad = \quad \frac{q}{n} \quad = \quad H$$

This measures the dept of poverty. Otherwise called standard of living shortfall.

$$\text{If } \infty = 1$$

$$P_1 = \frac{1}{n} \sum_{i=1}^{q} \left[\frac{Z-Y}{Z} \right]$$

$$\text{If } \infty = 2 \; P = \frac{1}{n} \sum_{i=1}^{q} \left[\frac{Z-Y}{Z} \right]^2$$

Model Specification

Logit regression was used to analyze the determinants of standard of living among the respondents. In this case, the dependent variable (standard of living or poverty) was measured on dichotomous scale (.i.e. binary). The independent variables were measured on quantitative. categorical or a mixture of both.

The basic form of the logit function is given as:

$$P = \frac{1}{1 + e^{-z}}$$

Where z is the predictor variable and 'e' is the base of mature logarithm and 'P' is an essential probability.When 'Z' the predictor variable is more than one, then the Z is a linear function of a set of predictor variable.

$$Z = b_0 + b_1X_1 + b_2X_2 + \text{-----------------}B_kX_k$$

This expression is substituted for 'Z' in the formular for the logic function above to become multivariable logit function as

$$P = \frac{1}{1 + e^{-(b_0 + b_1X_1 + b_2X_2 + \text{-----------------}B_kX_k)}}$$

Atala and Aguda (2006) made use of the logistic regression model to examine effect of some variables on development inequalities (gap) among selected L.G.As in Osun State, Nigeria. Hence in this study the logistic regression model used to examine the determinant of standard of living or poverty among household heads in the sudy area.

One way to get a measure of poverty P, depends on three parameters viz the headcount ratio H, the income gap ratio J, as a part of the poverty line (depth, incidence and severity) and the Gini coefficiet G of the distribution of income among the poor.

$$P = H \left[1 + (1 - J) G \right]$$

RESULTS AND DISCUSSION

Poverty gap

The following result were obtained

X_m	=	11328.9
X_f	=	7953.12
SD_m	=	105
SD_f	=	87.78
n_m	=	38
n_f	=	32

$$\text{T-test} = \frac{X_m - X_f}{\frac{SD_m}{\sqrt{n_m}} + \frac{SD_f}{\sqrt{n_f}}}$$

$$= \frac{11328.7 - 7953.12}{\frac{105}{\sqrt{38}} + \frac{87.78}{\sqrt{32}}}$$

t   =   103.8

Decision rule

Since t calculated (103 .8) is greater than t-tabulated (2.63) at 1%, we accept the alternative hypothesis which states that:

"there is significant gap between the poverty levels of male and female household heads".

This gap which was biased towards male headed households, could be attributed to males' access to input such as credit, extension contact, labour, access to land, legal constraints. Eboh and Ogbazi (1995) had earlier stated that women were denied access to the right of land ownership by inheritance and other factor of production.This factor tends to dampen the interest of women in engaging in large scale production. Closing this standard of living gap would require reorientation of the development effort toward emphasis on the social and economic dimension. This approach calls for economic growth with equity and the participation of the people with the integration of women as a pre- requisite for success. This is why Adisa and Okunade (2005) encouraged cooperative activities among woman groups.

3.1   Determination of Poverty Threshold among Household Heads

Poverty line is usually based on income or consumption data. The percentage of surveyed population below the poverty line provides a quick indicator of their standard of living. The core poor, moderately poor and non poor were identified and defined for the purpose of this study based on consumption expenditure data. Core poor are those households spending less thar 1/3 of the mean per capita household expenditure, while moderately poor spends less than 2/3 of mean per capita household expenditure and the non poor are those that spend precisely or more than the mean household expenditure.

Table 1: **Derivation of poverty Indices of household heads**

Derivation of poverty level of household heads	
Total mean per capita household expenditure	₦685,000.00
Total number of household	70
Mean per capita household expenditure	₦97,851.71
Moderate poverty 2/3 of MPCHHE	₦6,523.81
Core poverty 1/3 MPCHHE	₦3,261.91

(Source: Calculated from field survey, 2006)

3.2   Standard of living Measures among Respondents

The households' total expenditure on food ad non food items of the household of all respondents was used in constructing the poverty line. The mean per capita household monthly expenditure (MPCHHE) was estimated as ₦97,851.71k

The moderate poverty line is thus two-third of MPCHHE which is ₦6,523.81 while th core poverty line is given as ₦3,261.91 respondents whose MPCHHE is above ₦6,523.81 are regarded as non-poor. The depth of poverty is low and it requires only additional monthly income of ₦3,262 for an average poor to come out of poverty.

Table 2: Classification of Standard of Living level of Respondents

Classes of standard of living	Frequency	Percentage (%)
Core poor	13	18.6
Moderately poor	20	27.4
Non-poor	37	54.0
	70	100.0

(Source: field survey, 2006)

Table 2 shows that 18.6% of the respondent from the study area are in core poverty. 27.4% of the respondent are

moderatly poor, 54.0% are non-poor.

3.3 Distribution of Poverty Incidence, Poverty Depth and Poverty Severity among Household heads.

Table 3. Poverty Indices of Respondents

Poverty indices	Measures (%)
Poverty Incidence	37
Poverty Depth	37
Poverty Severity	97

(Source: Filed Survey, 2006)

Table 3 shows Poverty Incidence,Poverty Depth and Poverty Severity among Household heads.

3.3.1   Poverty Incidence

Poverty incidence among household heads was determined using the formula below: the Foster — Gieer. Thorbecke

(FGT) index

$$P_1 = \frac{1}{n} \sum_{1=i} \left[\frac{Z-Y}{Z} \right]$$

Y   =   per capital household expenditure

Z   =   poverty line

n   =   total population

Where

∞   =   0 measures the incidence of poverty

∞   =   1 measures depth of poverty

∞   =   2 measures severity of poverty.

where

n   =   70

$$P_1 \doteq 1 \sum \left[\frac{Z-Y}{Z} \right] = 26.06$$

$$= \frac{1}{70} \quad (26.06) \ x \quad 100$$

$$= \quad 0.37$$

$$0.37 \quad x \quad 100 \quad = \quad 37\%$$

Table 3. revealed the incidence of poverty to be 37%, which shows the proportion of the poor to the total population in the study area. This reveals that less than half of the respondents are poor:

3.3.2   The Depth of Poverty

The depth of poverty was determined as

$$= \quad P_0 = \frac{q}{n}$$

where q Number of poor

$$n \quad = \quad \text{Total population}$$

$$= \quad \frac{P_0 = q}{n}$$

$$\frac{26 \ x \ 100}{70}$$

$$= \quad 37\%$$

Table 3. reveals the depth of poverty as 37%. This shows those household heads whose standard of living falls below the poverty 1ine This finding support earlier results of (FAO, 2000). From this result, it shows that poverty is relatively low and distribution of income of the poor below the poverty line is uneven.

Poverty Severity

$$P_1 = \frac{1}{n} \sum_{i=1}^{q} \left[\frac{Z-Y}{Z} \right]^2$$

$$=1 \frac{(26.06)^2}{70}$$

$$= \quad 9.70$$

$$=9.70 \ x \ 100 = 97\%$$

The study reveals the severity of poverty in the study area as 97%. This measures the extent and shows the uneven distribution of the poor below the poverty line. This result shows that the incidence of poverty in the study area is

wide spread. This may be as a result of low income, little or no asset (Property), uneducated and live in unhealthy condition.

The result showed that poverty indices among the household were 37%, 37% and 97% for incidence, depth and severity. The result also showed that poverty was prevalent and severe among those who did not have access to credit.

Research Question

What must be done to improve the standard of living of household's heads in the study area?

 The following approaches must be adopted to bridge the poverty gap in the study area. Economic growth approach that seek to encourage broad based economic growth by focusing on developing human capital formation. Also basic needs approach calls for the provision of the basic needs such as food, shelter e.t.c. Rural development approach assume that poverty is more prevalent in rural areas and therefore focuses prominent attention on rural development in addresing rurality which is considered as the root cause of poverty. Targeting approach which directs poverty alleviation programmes at target groups within the country.

3.4   Determinants of Poverty Incidence among Household heads Hypothesis Testing

Ho: The seleted socio-economic variable: Monthly incornc:(X_1), Age (X_2), Household size (X_3), Year of schooling (X_4), Marital status (X_5), Gender (X_6) Location of respondents (X_7), Farm size (X_8), Savings (X_9), Credit accessibility (X_{10}) and non farming activity.(X_{11}), do not significantly determine poverty incidence among farming household heads in the study area. The hypothesis was tested with the use of logit model. The estimates of the determinants of poverty incidence among farming household heads are presented in the Table 4.

Table 4: Coefficients of Logit Regression of Determinants of Standard of Living

Variables	Coefficient	standard error	t-cal
Income	-0.159	0.682	2.323**
Age	-0.305	0.253	1.201^{NS}
Household size	0.103	0.175	5.803*
Education status	-0.109	0.681	1.600**
Marital status	-0.975	0.328	0.296NS
Gender	0.154	0.583	2.646**
Location	-0.406	0.555	0.731NS
Farm size	-0.0359	0.279	1.788**
Saving	-0.425	0.172	2.457**
Credit	-0.170	0.516	3.299*
Non farm activity	-0.23 5	0.443	5.292*

(Source: Field Survey, 2006)

R-Square56.736

* - Significant at 1%

** - Significant at 5%

NS — Not significant

The logit model has a good fit with R-square value of 56.73 which is statistically significant at 5%. The result of the logit model shows that eight variables are statistically significant at various levels in explaining the probability of a farmer being poor. These variables include income (X_1), Household size (X_3), Education status (X_4), Gender (X_6), Farm size (X_8), saving (X_9), Credit (X_{10}) and Non farm activities (X_{11}).

Income (X_1)

As stated in the Table above, there is significant relationship between poverty incidence and income (X_1). The coefficient (-0.159) indicates an inverse relationship which implies that the higher the income, the lower the poverty incidence of a household head.

Age (X_2)

The coefficient for age X_2 (-0305) is negative in the poverty incidence model. The fact that it i negative ii the model implies the probability of poverty incidence is less with increase in age. It is because the individual becomes more productive and acquie more asset and enjoys better welfare as he grows older but up to a particular age beyond which its productivity and welfare begins to wingle, hence age is not a significant determinant of poverty incidence at all times.

Household Size (X_3)

Household size (X_3) was found to have significant relationship and the coefficient (1.103) implying that increase in household size will result in increase in poverty incidence. Family planning will go along way to improve the welfare of farming houeho1ds m the study area.

Educational Status (X_4)

The finding reveals that there is significant relationship with coefficient (-0. 109) indicates that there is an inverse relationship between poverty incidence and educational status. The higher the educational attainment of educational household heads the less likely of becoming poor. This is because such individual is able to adopt improve farm practices which will translate to higher income and better welfare. This finding agrees with the report of Adelabu (2001) when he observed that poverty is wide spread among people with low education.

Marital Status (X_5)

The finding shows that the coefficient for marital status (-0.975) is not statistically significant. This implies that marital status is not a significant determinant of poverty incidence. Although, married people could combine resources and enjoy better living standards. Widower and single parent households who combine resources properly could live above poverty line. Gender (X_6)

The findings reveals that there is significant and positive relationship between gender and poverty incidence, that rnens that the female household heads have high probability of being poor than male household heads. This is because he female are less accessible to productive resources and are often marginalized, this will continue headed household to be poorer. This finding isin agreement with the earlier report of Batie (1992) that women household heads subsist at various level of deprivation. Adeoti and Oghonna (2004) have also hypothesized that female asset base is generally known to be lower than that of male.

Location (X_7)

Results also indicate that location (X_7) coefficient (-0.406) has a negative effect on poverty incidence. This implies that farming household in remote area is likely to be poor. Such household heads have less opportunities of engaging in high return activity than those far away from the urban area. This finding is in agreement with the earlier assertion of Oguwumike (2001) who observed that poverty incidence and poverty depth are more prevalent among rural dwellers than urban dweller.

Farm Size (X_8)

From the result, farm size has no significant relationship with the probability of poverty incidence. The coefficient (-0.359) indicates that there is an inverse relationship between poverty incidence and farm size, the larger the farm size of a housçhold head the lower the probability ol being poor. This is because a household with larger farm size is likely to have more income and more resources that will place him on a high welfare status.

Savings (X_9)

The result shows that there is an inverse relationship between poverty incidence and household savings. The coefficient (-0.425) denotes that the higher the savings the lower the poverty incidence of the respondent in the study area. The household who have more savings either in the form of cash or non cash is not likely to be poor.

Credit Accessibility(X_{10})

The result also reveals that there is inverse and significant relationship between poverty incidence and access to credit. The coefficient of credit (-0.170) indicates that access to credit is statistically significant. A farm household heads that is accessible to credit has the capacity to break out of poverty trap. The reverse is the case when the individual is not accessible to credit facility.

Non Farming Activity (X_{11})

Non farming activity turns out to be negative and significant in the standard of living model (-0.23 5) this implies that a household head that combines non farming activities with farming is less likely to be poor. Such household heads enjoy the benefit of high return from farming and non farming activities.

Conclusion and Recommendations

The standard of living of household heads in the rain forest zone of Delta state, Nigeria was investigated in order to determine the poverty incidence, depth, severity and the factors that significantly influence their standard of living. The study clearly shows that the standard of living shortfall of the surveyed households is 37% and they were generally poor (97%). Even at that, empirical evidence points to the fact that male household heads emjoy higher standard of living than their female counterparts. The low standard of living could be attributed to social and economic factors such as low income, rurality, low savings, poor access to credit, small farm size and large family size and lack of opportunities for non-farm income generating activities in the rural areas. The low income generated is thinly spread over members of the family with little or no improvement on welfare. Three recommendation domains were proffered: (i) there should be scaling up of extra-income generating activities, (ii) more credit facilities should be giving to household heads, particularly, women groups, by the government to break households from poverty trap and (iii) more access to more productive resources for more agricultural productivity in the rain forest zone of Nigeria.

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