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THE EFFECT OF LOCAL LEVEL INSTITUTIONS' MICROCREDIT DELIVERY ON RURAL FARM HOUSEHOLDS' POVERTY STATUS IN GIREI AND YOLA SOUTH LOCAL GOVERNMENT AREAS OF ADAMAWA STATE NIGERIA

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Abstract

The study analysed the effect of local level institutions' (LLIs) microcredit delivery on rural farm households' poverty status in Girei and Yola South Local Government Areas of Adamawa state, Nigeria. Multistage random sampling was used in selecting one hundred and twenty (120) rural farm households' member of the local level institution and data were collected through questionnaire administration. The study showed that 58% of the rural farm household head respondents were poor and require N4,955.00K to come out of poverty. This is because their per capita consumption is below the poverty line. Moreover, the Lorenz curve and Gini index of 0.207174 showed that the income distribution and income inequality among the respondents are typical not high. The squared poverty index of 0.17 which measures the severity of the poverty, and took into account of the income distribution and inequalities between the poor and the rich it revealed that the poor rural farm households per person in relation to the population only required 17% (N5,615.67) of poverty line to come out of poverty.The logit regression revealed that microcredit significantly added to the model (poverty status) with Naglekerke R Square = 0.402 and Chi-square = 42.604 and corresponding P-value = 0.001. Therefore, the study recommends the need for the government to formulate policies targeting at improving the welfare of the rural farm households, their source of livelihood and improve the lot of low-paid workers by integrating LLIs into the current poverty alleviation programme of the government and make channels for loan delivery so as to achieve the sustainable development goals of eradicating extreme poverty.

***Key words*:** *local level institutions, microcredit, poverty, income inequality, Nigeria*

INTRODUCTION

The rural poverty increases with sharp decrease in the standard of living of rural farmers. Inadequate capital is a major problem confronting small-scale enterprise including rural farmers in Nigeria. These rural farmers produce bulk of food consumed locally and some export crops which generate foreign exchange to the country. Poverty is the lack of command over basic consumption needs i.e. a situation of inadequate consumption level; giving rise to insufficient food, clothing and shelter [19]. While poverty can be seen as a situation of been moneyless and powerless [12]. As indicated in IBRD (1996) poverty in Nigeria is overwhelmingly a rural problem [17]. Empirical profile of poverty prevalence and factors influencing poverty among farm households is very important. Agriculture continues to be a fundamental instrument for sustainable development, poverty reduction and enhanced food security in developing countries. Moreover, 112.519 million Nigerians live in relative poverty and the conditions is alarming [18]. The North-West and the North-East had the highest poverty rates in the country in 2010 with 77.7 per cent and 76.3 per cent respectively. However, the South-West geo-political zone recorded the lowest at 59.1 per cent [18]. More worrisome is the fact that the poverty rate is rising at a time the Gross Domestic Product (GDP) growth rate is put at 7.75 per cent. per cent and 76.3 per cent respectively. The North-East geo-political zone has higher population of rural-farmers with farming as source of livelihood. These rural-farmers are faced with

the problem of unavailability of credits and inaccessibility to the available formal credit.

Local institutions' microcredit delivery and effects had been studied on rural farm households' poverty in Abia State [4]. The study analysed the farm households' mean contribution (savings) to the local institution; it examined the amount demanded by members, vis-a-vis disbursement by the local institution; poverty profile and effect of microcredit from local institutions on farm income and expenditure of rural farm households in Abia State while a study on impact of microcredit on poverty alleviation in Enugu East Local Council of Nigeria was conducted, estimating the level of access to credit and their sources; incidence, depth and severity of poverty among the rural populace [3]. Both study showed that microcredit delivered to rural farm households has positive effect in their poverty status. Recent study by International Fund for Agricultural Development (IFAD) showed that lack of formal credit affects rural poverty and encourages indigenous financial arrangements to take the place of missing formal finance [14]. Informal financial institutions such as microcredit programmes have positive effects on the welfare of the people [11]. It reduced poverty through microfinance and thrift societies. It also increased women empowerment, improved savings and purchase of agricultural inputs and ensured easy access to loans with considerably lower interest rates. Farmers' participation in savings and credit cooperative societies: mean per capita annual farm income and poverty reduction in Niger state, Nigeria was achieved [13]. While microcredit as a strategy for poverty reduction in Benue state, Nigeria was analysed [1]. The data from 274 respondents were analysed using descriptive and inferential statistics and revealed that microcredit has help in reducing poverty among the respondents. Another research on the impact of micro finance on poverty reduction revealed that access to microfinance is very important because it enables the poor to create, own and accumulate assets and smoothened consumption [16]. Moreover, it was observed that "sustainable access to microfinance helps alleviate poverty by generating income, creating families to obtain health care and empowering people to make the choice that best serve their needs [5].

The broad objective of this study is to analyse the effect of Local Level Institutions' microcredit delivery on the rural farm households' poverty status. The specific objectives are as follow:

i.Determine the poverty line, poverty incidence and poverty gap among rural households.

ii.Analyze the effect of microcredit on the rural farm households' poverty status.

iii. Analyze the income inequality among the rural farm households.

MATERIALS AND METHODS

This study was carried out in Yola South and Girei Local Government Areas of Adamawa State, Nigeria. Girei Local Government Area lies between Longitude 11º14' E and Latitude 7º11' N and Yola South Local Government Area lies between longitude 12º28'E and latitude 9º14'N of the Equator and of the GMT [2]. It has rain season from April and ends in October, while the dry season starts in November and ends in April. The mean annual rainfall of the area is about 1000mm [2]. The soil type around is generally loamy with alluvial deposits the river valleys suitable for cowpea production, marketing of agricultural produce. Large number cowpea marketers abound in both the two local government areas. This study adopted multistage random sampling technique to select the wards, local level institutions and farm households. List of registered local level institutions was collected from the local government secretariat. In the first stage, twelve (12) wards were randomly selected from the two local government areas. This was used as the sampling frame. The second stage was the random selection of two (2) local level institutions from each of the wards. This gives twenty-four (24) local level institutions. The last stage was the random selection of five (5) farm households' beneficiaries of local institutions' microcredit delivery in each of the selected local level

institutions. This gives a total of one hundred and twenty (120) respondents to be sampled. Primary data was collected with the aid of questionnaire. Inferential statistics such as; Foster-Greer-Thorbecke (FGT) Poverty Measures was used to determine the poverty line, poverty incidence and poverty gap among rural farm households, Logit regression model was used to analyse the effect of microcredit to the poverty status of the rural farm households and Gini-coefficient (Gini index) was used to analyse the income inequality among the rural farm households.

Poverty Measures

Foster-Greer-Thorbecke (1984) was used to determine the poverty status of beneficiaries of Local Institutions' microcredit [9]. The model is specified as:

$$P_\alpha = \frac{1}{N}\sum_{i=1}^{H}\left(\frac{Z-Y}{Z}\right)\alpha$$

where:
Z = poverty line
N = total Sample
H = the number of poor (below poverty line).
Y = average household monthly *per capita* expenditure
α = poverty index which takes value of 0, 1 and 2
(1). When α = 0, the poverty index (PI) becomes Head Count Ratio or Poverty Incidence Index (HCR or PI) i.e. the proportion of people below the poverty line. It is used to determine the number of households having *per capita* expenditure below the poverty line. It is stated as: Po = H/n. where H is the head count. The PI (P0) gives the prevalence of poverty at a point in time.
(2). When α = 1, PI becomes the Poverty Gap Index (PGI) i.e. the aggregate short fall in expenditure of the household from the poverty line. It measures the difference between actual expenditure and minimum non-poverty expenditure. The proportion of the poverty line (value) that the average poor require to meet the poverty line; the lower the value, the lower the poverty gap. The PGI (P1) gives the depth of poverty at a point in time.
(3). When α = 2, PI becomes poverty severity index (PSI) i.e. PSI gives more weight to the poverty gap of the poorest. The closer the value is to 1 (100%), the harder the poverty condition of the household. The PSI gives the severity of poverty at a point.

Logit Regression Model

Logistic regression model was used to analyse the effect of microcredit and other socio-economic characteristics on the poverty status of the rural farm households in the study area.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + ... + \beta_{11} X_{11} + \mu_w$$

where:

$$Y = Y_i = \ln \frac{P_i}{1 - P_i}$$

Y= annual average expenditure of the household/ total number of days in the year (365)
Y = the poverty status i.e. the probability which measures the total contribution of the independent variables in the explanation of the dependent variable in the model.
X_1=Microcredit
X_2=Age
X_3=Marital status
X_4=Educational level
X_5=Number of wives
X_6=Farm size
X_7=Household size
X_8=Main occupation
X_9=What do you do with the produce (Whether all were sold or consumed, more than 50% consumed or sold)
X_{10}=Gender
X_{11}=Family type
$\beta_0 - \beta_{11}$=coefficients

The Gini-Coefficient (Index)

The Gini coefficient was developed by the Italian Statistician Corrado Gini as a summary measure of income inequality in society [10]. It is usually associated with the plot of wealth concentration introduced a few years earlier by Max Lorenz [15]. It measures the ratio of the area between the Lorenz curve and the equidistribution line (henceforth, the concentration area) to the area of maximum concentration. Since these measures were introduced, they have been applied to topics other than income and wealth, but mostly within Economics [8][20]. When G is based

on the Lorenz curve of income distribution, it can be interpreted as the expected income gap between two individuals randomly selected from the population [20].

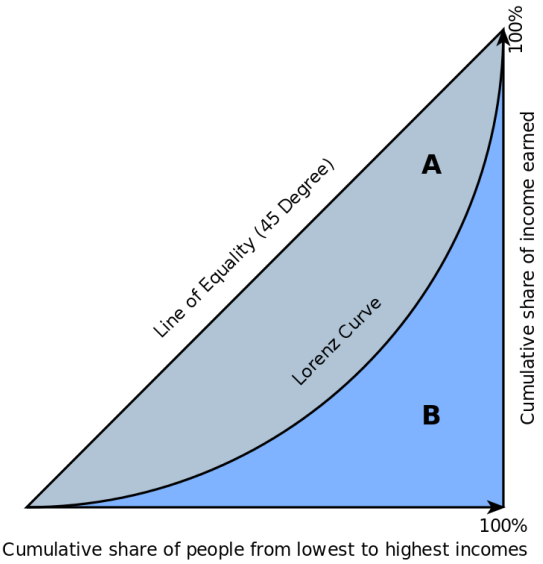

Fig. 1. Lorenz curve of income
Source: Own calculation

$$G = \frac{concentration\ area}{maximum\ concentration\ area} = \frac{A}{A+B}$$

The area under the Lorenz curve is more easily calculated as follows;

Recall the definition of the coordinates of the Lorenz curve. Given $y_1 \leq y_2 \leq \ldots \leq y_n$, it must be that:

$$q_i = \frac{y_1 + y_2 + \ldots + y_i}{y_1 + y_2 + \ldots + y_n} = \frac{y_1 + y_2 + \ldots + y_n}{Y}$$

(cumulative proportion of income)

$p_i = \frac{i}{n}$ (cumulative proportion of population)

With $q_0 = p_0$ and $q_n = p_n = 1$

The area of the triangle is given by:

$$Z_1 = \frac{\overbrace{p_1}^{base}\ \overbrace{q_1}^{height}}{2}$$

While the area of each trapezium is given by:

$$Z_i = \frac{\overbrace{(q_i + q_{i-1})}^{longbase+shortbase}\ \overbrace{(p_i - p_{i-1})}^{height}}{2}$$

As $q_0 = p_0 = 0$, the sum of all these areas give rise to:

$$Z = \sum_{i=1}^{n} Z_i = \frac{1}{2}\sum_i [(q_i + q_{i-1})(p_i - p_{i-1})]$$

for n=4

Note, Z is not the concentration area but the area under the Lorenz Curve. To calculate the concentration area (the numerator of the Gini Index) we subtract Z from the maximum concentration area (½) as follows:

$$Conc.area = \frac{1}{2} - Z = \frac{1}{2} - \frac{1}{2}\sum_i [(q_i + q_{i-1})(p_i - p_{i-1})]$$

therefore, Gini Index G is equal to:

$$G = \frac{\frac{1}{2} - \frac{1}{2}\sum_i [(q_i + q_{i-1})(p_i - p_{i-1})]}{\frac{1}{2}} =$$

$$1 - \sum_i [(q_i + q_{i-1})(p_i - p_{i-1})]$$

Or simply: $G = 1 - 2Z$

RESULTS AND DISCUSSIONS

Poverty Profile of the Rural Farm Households

The study adopted the expenditure approach in determining the poverty profile of the rural farm households. This is done by aggregating the total expenditure on food consumption and production by rural farm households. The poverty profile of the respondents was showed in the Table 1. The result showed that the poverty line (mean monthly household expenditure) was N33,033.33 per month. The poverty headcount index (poverty incidence) was 0.58. This showed that 58% of the rural farm household head in the study area were poor because their per capita consumption is below the poverty line.

Also, it showed that the poverty gap index (poverty depth) was 0.15. This showed that the respondents required 15% of the poverty line to come out of poverty. This amounted to N4,955.00 per rural farm household head per month. The result showed that the squared poverty index was 0.17. This measured the severity of the poverty, and took into account the inequalities between the poor persons. It revealed that the poor rural farm households per person in relation to the population, each

person (household member) needs 17% (N5,615.67) of poverty line to come out of poverty.

Table 1. The Rural Farm Households' Poverty Profile

Poverty indicators	**Values**
Mean monthly expenditure (N)	33,033.33
Poverty line (N)	33,033.33
Poverty headcount index	0.58
Poverty gap index (Poverty depth)	0.15
Squared poverty index	0.17

Source: Own calculation.

Effect of Local Level Institutions' Microcredit Delivery on the Rural Farm Households' Poverty Status

We check to make sure that the data to be analysed can actually be analysed using a binomial logistic regression before Analysing data using binomial logistic regression.

Therefore, let's take a look at some of these assumptions: #1. Dependent variable should be measured on dichotomous scale which we have the poverty status, #2. One or more independent variables can be either continuous or categorical variable, #3. There should be independence of observations and the dependent variable should have mutually exclusive and exhaustive categories, #4. There needs to be linear relationship between any continuous independent variables and the logit transformation of the dependent variable. These four assumptions were met: 1. Poverty status are measured dichotomy scale and nominal scale (poor=1 and non-poor=0), 2. Gender age etc. are continuous and categorical, 3. There is independence of observations and poverty status are mutually exclusive and exhaustive categories, 4. The Box-Tidwell (1962) procedure was used to test for linearity and since there was no significance interaction showing there is no problem [7].

A logistic regression was performed to ascertain the effects of microcredit, age, gender, what do you do with your produce, year spent in the institution, educational level, number of wives, family type, marital status, main occupation, household size and farm size on the likelihood of that farm households were poor. Table 2 showed that the logistic regression model was statistically significant, $X^2 = 42.604$, $p<0.005$.

Table 2. Logit Regression Result of Effect of Local Level Institutions' Microcredit Delivery on the Respondents Poverty Status.

Naglekerke R Square = 0.402 **Chi-square = 42.604 P-value = 0.001**				
Classification table				
Observed		Predicted		
		Poverty status		Percentage corrected
		Non poor	Poor	
Poverty status	Non poor	30	20	60.0
	Poor	14	56	80.0
Overall percentage				71.7
Variables in the Equation				
Variables	B	Wald	Sig.	Exp(B)
WDP		5.077	0.079	
WDP(1)	1.783	3.447	0.063	5.948
WDP(2)	1.241	4.337	0.037	3.459
Year Spent	-0.098	0.105	0.745	0.907
Education level	-0.296	0.819	0.366	0.744
Number of wives	-0.549	0.790	0.374	0.577
Family type		0.959	0.619	
Family type(1)	-38.902	0.000	0.998	0.000
Family type(2)	-39.577	0.000	0.998	0.000
Marital status		4.494	0.213	
Marital status(1)	-22.887	0.000	0.998	0.000
Marital status(2)	-1.996	1.961	0.161	0.136
Marital status(3)	-3.432	4.322	0.038	0.032
Gender(1)	.568	0.255	0.614	1.765
Age	-0.028	0.736	0.391	0.972
Main occupation		3.826	0.148	
Main occupation(1)	-38.144	0.000	0.998	0.000
Main occupation(2)	-39.392	0.000	0.998	0.000
Farm size	0.454	1.604	0.205	1.574
Household size	-0.030	0.179	0.672	0.971
Microcredit	0.000	1.247	0.264	1.000
Constant	81.009	0.000	0.998	1.519E35

Source: Own calculation.

The model explained 40.2% (Nagelkerke R^2) of the variation in the poverty status of the farm household and had 71.7% as Percentage Accuracy in Classification (PAC) which correctly showed that the model is good. The Wald test was used to determine statistical significance of each of the independent variables. The statistical significance of the test is found in the "Sig." column which the p-value. It revealed that microcredit (P=0.264), what you do with the produce (P=0.079), educational level (0.366), number of wives (P=0.374), marital status (P=0.213), age (0.391), main occupation (P=0.264), farm size

(P=0.205), added significantly to the model/prediction but family type (P=0.619), gender (P=0.614), and household size (P=0.672) did not add significantly to the model at cut value 0.5. "Exp(B)" column in the table 4 showed the chances to be poor is 1.765 times greater for males headed households as opposed to females, 0.136 times greater for widows as opposed to single and 0.032 times greater for widowers as opposed to single.

The Income Inequality Among the Rural Farm Households.

The Lorenz curve for income among the respondents is shown in figure 2 as calculated from table 5. The Gini coefficient of 0.207174 as calculated from the Lorenz curve showed that income distribution and inequality among is a typical distribution. These results showed that income inequality among the respondents is not high as the LLIs give platform for Adashe and other forms of loan facilities.

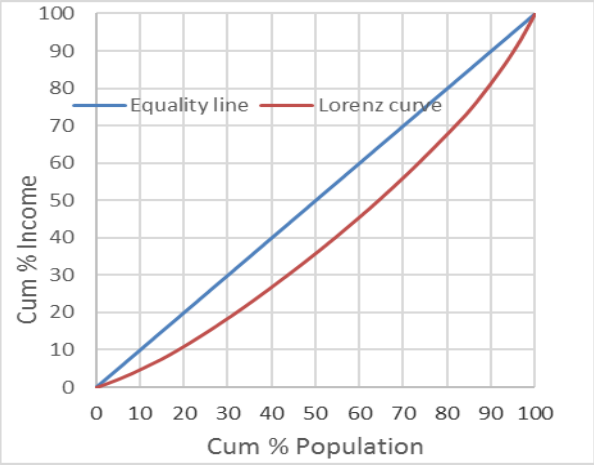

Fig. 2. The Lorenz curve of income, Girei and Yola South LGAs' LLIs' members.

Source: Own calculation.

Table 5. Income distribution for plotting Lorenz curve

Cum % Pop	Cum % Income
0.00	0.00
20.00	10.99
40.00	26.88
60.00	45.58
80.00	67.80
100.00	100.00

Source: Own calculation

CONCLUSIONS

The study showed that 58% of the rural farm household head respondents were poor and require N4,955.00K to come out of poverty. This is because their per capita consumption is below the poverty line and income inequality among them is typical. Moreover, the Lorenz curve and Gini index of 0.207174 showed that the income distribution and income inequality among the respondents are typical not high.

However, the squared poverty index of 0.17 which measures the severity of the poverty, and took into account of the income distribution and inequalities between the poor and the rich it revealed that the poor rural farm households per person in relation to the population only required 17% (N5,615.67) of poverty line to come out of poverty. Unlike strong income disparity discovered in Nigeria as a country. [6]

Also, the microcredit delivered to members is positive and significantly predict the poverty status of the rural farm households. The findings of the study therefore recommend the need for the government to formulate policies targeting at improving the welfare of the poor, source of livelihood and improve the lot of low-paid workers by integrating LLIs into the current poverty alleviation programme of the government and make channels for loan delivery so as to achieve the sustainable development goals of eradicating extreme poverty.

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