Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development
Vol. 17, Issue 1, 2017
PRINT ISSN 2284-7995, E-ISSN 2285-3952

ANALYSIS OF LOCAL LEVEL INSTITUTIONS' MICROCREDIT DELIVERY EFFECT ON THE LEVEL OF OUTPUT OF THE RURAL FARM HOUSEHOLDS IN GIREI AND YOLA SOUTH LOCAL GOVERNENTS AREA OF ADAMAWA STATE, NIGERIA

Udegbunam Edwin CHINONSO, Onu Inyanda JUSTICE

Modibbo Adama University of Technology, Department of Agricultural Economics and Extension, P.M.B. 2076, Yola, Nigeria, Phone; +2348037858314, +2348036050936, edwinudegbunam@gmail.com, justiceonu@yahoo.co.uk

Corresponding author: edwinudegbunam@gmail.com

Abstract

The study analysed local level institutions' (LLIs) microcredit delivery effect on the level of output of the rural farm households 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 result of multiple regression showed that microcredit significantly added to the level of output of the rural farm households with R square = 0.75, F statistic = 41.76 and it corresponding P-value= 0.0000. Therefore, LLIs microcredit delivery has significant effect on the rural farm households' poverty status and the study recommended that LLIs should be integrated into the current poverty alleviation programme and food security programme of the government. Also, make channels for loan delivery so as to empower its members financially as well as achieving the sustainable development goals of eradicating extreme poverty and food security.

Key words**:** *local level institution, microcredit, poverty, Nigeria*

INTRODUCTION

Local Level Institutions (LLIs) also known as Informal Financial Institutions (IFIs) had several definitions by researchers. Local Level Institutions are those institutions that embrace all financial transactions that takes place beyond the functional scope of various countries and other financial sector regulation [1]. These institutions are not controlled directly through major monetary and financial policy instruments but are created by individuals and groups with no legal status. They are referring as institutions that are not directly amendable to control by key monetary and financial policy instruments [7]. They carry out contract or agreement conducted without reference or recourse to the legal system to exchange cash and present for promise of cash in future. They emanate from the grassroots, bottom up demand of the poor for an appropriate financial service. In this study Local Level Institutions could be defined as those associations that substitute formal financial institutions, facilitating savings and ensuring easy access to credit to members and operating without direct control of the governmental financial authorities. The traditional/local institutions and groups are social and economic. Some serve both social and economic purposes in livelihood of their members. The social groups help in creating social capital, institutional identity, and relationships within, members' attitudes and values that govern interactions among them as a people. These contribute to economic and social development of the communities [8]. These communities have cooperative groups, religious groups, mutual associations groups, Age grade groups, social and friends' club and Fadama groups. The economic groups concern themselves with their mutual interest that revolve around solving problems of primary production and marketing of whatever is their products and services. Evidence is showing that local institutions can have an impact on developmental outcomes – growth, equity, and poverty alleviation. Social

capital as reflected in associational activity may lead to less imperfect information and hence lower transactions costs and a greater range of market transactions which can in turn lead to better outcomes [11].

Impact of micro-finance on the efficiency of wood-processors, tailors and hair dressers was explored and factors that affected their efficiency were found to be age, experience of the business, education level, training programs and microcredit [6]. Microcredit had a positive and significant effect on the efficiency of all the three categories of micro entrepreneurs. Also, impact of Microfinance on poverty reduction in Adamawa state was analysed with descriptive and inferential statistics and it was revealed that microfinance had a significant effect on the income of the beneficiaries [14]. Research on the extent to which microcredit impact on small scale farm production in Ondo state evaluated the production efficiency of farmers participating in the microfinance and the determination the of credit utilization on traditional farming in western Nigeria [3]. A multi-stage sampling technique was used to collect primary data using structured questionnaire from 100 beneficiaries from the selected financial institutions in the study area. The findings revealed that the beneficiaries had more farm resources and more productive than before. Data Envelopment Analysis was used to check the efficiency of 46 microfinance schemes [12]. They used poverty approach rather than production approach to see the efficiency of microfinance. Average technical efficiency score was recorded at 80% of the schemes. Age and the location of the schemes were found to have the significant impact on the efficiency of the microfinance using 2nd stage regression. The effect of microfinance on small-scale poultry production in Imo state, Nigeria was investigated using purposive and random sampling techniques [9]. The study found out that male respondents recorded higher poultry production than their female counterparts. This was attributed to the fact that they cover much distance in acquiring other inputs than their female counterparts which the business requires. It also observed that there is a significant positive relationship between volume of loans obtained from microfinance banks and poultry production, thus, indicating microcredit enhances poultry production in the region. Also, the effect of microfinance on small scale Poultry business in South West Nigeria had earlier been investigated [4]. Out of the total sample, 29% took loan from co-operative societies. Education level, business experience and number of birds in the farm were positive and significant. Funds intensity was highest for usage of inputs while it was lowest for the business experience. The role of microfinance in reducing poverty was carried with a sample of 100 microfinance borrowers which are maize farmers [1]. The impact of microfinance on socioeconomic well-being was found to be quite minor due to lack of entrepreneurial skills.

Therefore, there is the need to adopt new technology in the agriculture sector that requires credit [16]. Cobb-Douglass regression was used on the data from 1990 to 2008. Credit used for seed, fertilizer, pesticides, irrigation and tractors were strongly related with the agriculture gross domestic product. Impact of credit on agriculture production was found to be more than 80%. Thereby it was concluded that credit access had a very significant role in increasing agriculture productivity [16]. The determinants of the efficiency of poultry farmers using micro credit in one of the states of Nigeria applying SFA technique on a sample of 115 showed that microcredit was have a positive and the significant impact on the technical efficiency [15].

The local level institution microcredit delivery needs to be encouraged among rural farmers as an easy source of credit. Rural-farmers need to form groups or local institutions that enable them access micro loans from the groups or other formal lending financial sources. These rural farmers produce bulk of food consumed locally and some export crops which generate foreign exchange to the country.

MATERIALS AND METHODS

The study area was 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]. The study area falls within the Northern Guinea Savannah Zone with land mass of 2,420.05km2 and a population of 512,849 [13].

The area is bounded by Song, Fufore, Demsa and Yola North Local Government areas to the south and east, to the north and to west respectively. There are twenty-two (22) wards in the study area; Toungo, Bako, Makama A, Malkohi, Adarawo, Bole-Yolde Pate, Namtari, Yolde-Kohi, Mbamba, Mbwaramoi and Ngurore wards in Yola South local government area and Girei I, Girei II, Tambo, Modire, Gereng, Dakri, Jera Bakari, Wuro Dole, Damare, Jera Bonyo and Goron in Girei local government area.

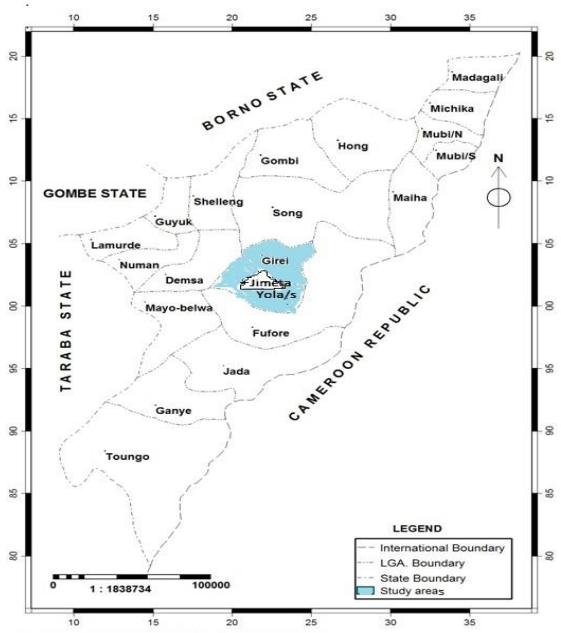

Fig. 1. Map of Adamawa Showing the Study Areas
Source: Own determination.

The rain season commences in April and ends in late October, while the dry season starts in November and ends in April. The mean annual rainfall of the area is about 1000mm [2]. The study area is generally suitable for agriculture due to the type of climate, landforms, and soil types it exhibits. 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. Other crops produce in the areas are rice, maize, sorghum, groundnut, soy beans, millet, sweet potato, yam etc.

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. Information collected include: socio-economic characteristics of members of Local Level Institutions such as; age, education level, household size, secondary Occupation, farms size, farming experience, annual income, amount of contribution by members of Local Level Institution etc. The outputs of the major crops grown by the respondents such as; maize, sorghum, millet, melon, soya bean, cowpea, groundnut, rice etc. were determined into Grain Equivalents. Multiple regressions like double-log, exponential, semi-log and linear production function were used to analyse the effect of micro-credit on the level of output of rural farmers. Double-log was selected among others based on the three (3) model selection criteria. The test for Multicollinearity, autocorrelation, heteroscedasticity, normality and specification error was carried with respect to the stated hypothesis below referencing Ordinary Least Squared (OLS) assumptions.

H_0: Residuals are not dependent i.e. there is independency among residuals
H_1: Residuals are highly dependent

H_0: Residuals are not serially correlated
H_1: Residuals are serially correlated

H_0: Residuals are not heteroskedastic i.e. residuals are homoscedastic
H_1: Residuals are heteroskedastic

H_0: Residuals are normally distributed
H_1: Residuals are not normally distributed

H_0: There is no specification error
H_1: There is specification error

Therefore, in all the stated hypothesis above, if the null hypothesis were not rejected it means the selected model specification is correct. The production function is the mathematical way of describing the relationship between the production of a given output and the factors affecting the production process [10]. There are various functional forms of the Production Function Analysis. These include Quadratic, Linear, Square root, Spillman and Cobb-Douglas methods. However, for this study the Cobb-Douglas Function will be used. The Cobb-Douglas functional form uses the formula:

$$Logy = b_0 + b_1 Logx_1 + ... + b_6 Logx_6 + \varepsilon_i$$

where: y = Output products in grain equivalents
x_1 = Microcredit in naira
x_2= Seeds in grain equivalents
x_3 = Herbicides and pesticides in litres
x_4 = Land in hectare
x_5 = Labour in standard man-day
x_6 = Fertilizer in kg
b_0 = Intercept
b_1– b_6 = Coefficients to be used
ε_i = Random variable.

RESULTS AND DISCUSSIONS

Multiple regression analysis like; linear, exponential, semi-log and double-log production function was used in analysing the effect of microcredit on the level output of crops. Table 1 shows the result of the four (4) model specification. The result revealed that linear has the value of R squared (0.842630), F-statistic (100.8419) and its corresponding p-value (0.00000). This implies that 84.26% of their level of output is as a result of the input used in farming. In other words, the regressors (microcredit, seed, herbicide and pesticide, fertilizer, land and labour) had explained about 84.26% of the total variation in the regress (level of output), while the remaining 15.74% remained unexplained variables. The F-statistic and its corresponding p-value showed the joint explanation of t-statistic and p-value in the regress. Linear has three (3) out of the six (6) of the explanatory variables significant at 5% which is acceptable because at least half of the explanatory variable has to be significant for a model to be selected.
The coefficients and signs are good in reference to statistic and economic theory. Exponential has R^2 0.639798 and Prob(F-statistic) of 0.000000 but has negative sign for microcredit which against the statistic and economic theory. It has three of the explanatory variables significant at 5%. Semi-log has R^2 = 0.741294 and Prob(F-statistic) = 0.00000, four (4) of the explanatory variables significant but has signs of seeds and land to be negative which is against the statistic and economic theory. Whereas the result shows that double-log has R^2 = 0.746692 and Prob(F-statistic) = 0.000000, five (5) of the explanatory variables significant and signs and coefficient concurred with the statistic and economic theory.

Diagnostic Tests

The model was subjected to several hypothetical tests as a criterion for model selection. In so doing the econometric criterion known as 2^{nd} order test was considered to establish whether the estimates have desirable properties and whether there is a violation of ordinary least squared (OLS) method.
There exists no high correlation between any two independent variables and we fall to reject the null hypothesis. Multicollinearity makes significant variable insignificant by increasing its standard error. It makes the standard error to go up, t-value goes down thereby making the p-value high. Nonetheless, the study data is a cross sectional data but autocorrelation was test for and removed before any other test. This was because Eviews (Eviews 9) used in the analysis

presents such data as time series data. Table 2 showed that the residuals are autocorrelated (autocorrelation 1 with p-value of 0.39%) and it was removed and tested again (autocorrelation 2 with p-value 5.48%) which is above 5% meaning the null hypothesis is accepted. Heteroscedasticity test gave a p-value of 62.58% showing that the null hypothesis will not be rejected. Table 2 shows the result of the normality test, Jarque-Bera (0.064202) and its p-value (96%) which is above 5% meaning we fall to reject null hypothesis.

RESET which is the general test for the specification errors like: (a) omitted variables; where x does not include all the relevant variables. (b) Incorrect functional form; where some or all of the variables in y and x should be transformed to logs, powers, reciprocals, or in some other way. (c) where correlation between x and ε_i which may be caused by the measurement errors in X, simultaneous equation considerations, combination of lagged y values and serially correlated disturbances. Ramsey's RESET test results were shown in table 6 with t-statistic and its corresponding p-value (40.29%), F-statistic and its corresponding p-value (40.29%) and likelihood ratio and its corresponding p-value (37.44%). These results were above 5% showing that there was no specification error. Therefore, we fall to reject the null hypothesis.

Since all the tests failed to reject the null hypothesis, Cobb-Douglass model was selected as the best model specification. This can be stated as follows:

$$\log y = -2.41814 + 0.46029\log x_1 + 0.190081\log x_2 + 0.444584\log x_3 + 0.607708\log x_4 + 0.208203\log x_5 + 2.32600\log x_6 + \varepsilon_i$$

Table 1. Multiple Regression Result of Effect of Local Level Institutions' Microcredit Delivery on the Level of Output (Crop)

Model specification	**b_0**	**b_1**	**b_2**	**b_3**	**b_4**	**b_5**	**b_6**
Linear	-3012.6	0.05945	7.49248	695.438	292.659	8.93513	2.40729
t-statistic	-6.3395	6.44660	2.45464	7.02351	1.10816	0.94778	1.08143
P-value	0.0000	0.0000	0.0156	0.0000	0.2701	0.3453	0.2818
Exponential	5.85295	-00000	0.00249	0.19110	0.30104	0.01019	0.00111
t-statistic	31.6764	-0.0174	2.09508	4.96356	2.93159	2.78065	1.27803
p-value	0.0000	0.9862	0.0384	0.0000	0.0041	0.0064	0.2039
Semi-log	-57243	3591.28	-126.79	2433.67	-751.31	1308.77	3279.33
t-statistic	-8.3355	4.96300	-0.3413	4.23067	-0.9853	2.12444	4.47246
P-value	0.0000	0.0000	0.7337	0.0001	0.3273	0.0365	0.0000
Double log	-2.4181	0.46403	0.19008	0.44458	0.03391	0.30608	0.60771
t-statistic	-1.6485	3.00220	2.39550	3.61828	0.20820	2.32600	3.88022
P-value	0.1029	0.0035	0.0188	0.0005	0.8356	0.0224	0.0002
	R squared	F-statistic	Prob(F-statistic)				
Linear	0.842630	100.8419	0.000000				
Exponential	0.639798	33.45208	0.000000				
Semi-log	0.741294	40.59296	0.000000				
Double-log	0.746692	41.76000	0.000000				

Source: Own calculation.

Table 2. Autocorrelation, Heteroscedasticity, Normality and Ramsey RESET Test Results

Diagnostic tests	**Observed R-squared**	**Probability**
Autocorrelation 1	11.10890	0.0039
Autocorrelation 2	5.809488	0.0548
Heteroscedasticity	5.280032	0.6258
Normality	Jarque-Bera	
	0.064202	0.968409
Ramsey RESET	t-statistic	
	0.841760	0.4029
	F-statistic	
	0.708560	0.4029

Source: Own calculation.

CONCLUSIONS

The multiple linear regression analysis predicted the model, three out of the six of the variables were significant and R-square more-than 60% which are conventionally accepted. Double-log has five (5) of the variables significant which is highest with R-square 75%.

Although this doesn't mean that the model is well predicted, we subjected the model to diagnostic test.

Normally Eviews presents data as time series data and this led to removal of autocorrelation. The test for autocorrelation (0.0548), heteroscedasticity (0.6258), normality (0.968409) and Ramsey RESET (0.4029) showed that the model is well predicted and LLIs microcredit delivery is positive and significant in the level of output of the rural farm households.

Autonomous local level institutions should be integrated into the current poverty alleviation programme of the government. They should be made channels for loan delivery so as to empower its members financially as well as achieving the sustainable food security.

REFERENCES

[1]Adams, S., Bartholomew, T.A, 2010, The Impact of Microfinance on Maize Farmers in Nkoranza (BrongAhafo Region of Ghana) J. Mgt Resources, 2(2): 1-13.

[2]Adebayo, A.A., 1999, Climate I&II (Sunshine, Temperature, Evaporation and Relative Humidity: In Adebayo, A. A. and Tukur, A.L. (eds) Adamawa in Maps, paraclete publisher Yola, Nigeria. Pp. 15-30.

[3]Adesunmi, R., 2004, Mobilizing Domestic Resources for Capital Formation in Ghana: The Role of Informal Financial Sectors AERC Research Paper No.3.

[4]Akanni, A. K., 2007, Effect of Microfinance on Small Scale Poultry Farmers in South Western Nigeria. Emirate Journal of Food and Agriculture. 19(2): 38-47.

[5]Aryeetey, E., 1997, The Characteristics of Informal Markets in Sub-Saharan Africa: J. of African Economics, 4 (1)47-56

[6]Bhasin, V. K., Akpalu, W., 2001, Impact of Micro-finance Enterprise on the Efficiency of Micro Enterprise in Cape Coast. IFLIP Research paper 01-5, International Labour Organization.

[7]Chipeta, C., Mkandawaivr, M.L.C., 1991, The Informal Financial Sector and Macro-economic Adjustment in Malawai. African Economic Research Consortium. Research Paper. No. 4.

[8]Grootaert, C., Van Bastelaer, T., 2002, The role of social capital in development: An empirical assessment, Cambridge University Press.

[9]Iruo, F.A., Onyeneke, R.U., 2012, Socio-economic analysis of the effect of microfinance on small scale poultry production in Imo state, Nigeria Agricultural Science Research Journals, Vol. 2 (2) pp. 84-91.

[10]Jongur, A.U., 1993, Analysis of the Performance of Agricultural Cooperative Societies in Gongola State. A Case Study of Michika Local Government Area. Unpublished M.Sc. Dissertation. Zaria: Department of Agricultural Economics, Ahmadu Bello University.

[11]Narayan, D., Pritchett, L., 1999, Cents and Sociability: Household Income and Social Capital in Rural Tanzania., Economic Development and Cultural Change, 47(4): 871-897.

[12]Nghiem, H.S., Coelli, T., Rao, P., 2006, The Efficiency of Microfinance in Vietnam: Evidence from NGO Schemes in The North and The Central Regions, Second International Conference on Environmental, Cultural.

[13]NPC, 2006, Report of Nigeria's National Population Commission on the 2006 Census, Population and Development Review 33, No. 1, 2007:209.

[14]Nudamatiya, A.B., Giroh, D.Y., Shehu, J.F., 2009, The impact of Micro finance on poverty reduction in Adamawa state, in: World Development Report, Vol. 28, No. 4, pp. 617-629.

[15]Oni, A.O, Adepoju, OA, Opawole, O., 2011, Socio Economic Characteristics, Micro-Credit and Technical Efficiency of Poultry Farmers in Lagelu Local Government Area of Oyo State, Nigeria, African Journal Livestock Extension, 9.

[16]Saleem, A.M., Jan, A.F., 2011, The Impact of Agricultural Credit on Agricultural Productivity in Dera Ismail Khan (District) Khyber Pakhtonkhawa Pakistan, Euro. Journal Business Management, 3(2): 1–8.