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15.	The Effects of Advertisement on the Choice of Processed Food among Secondary School Students in Zaria, Kaduna State	C. Natala; T.O. Ojo & S.L. Ajayi	90
16.	Current Patterns, Problems and Prospects of Marriage in Nigeria: The Christian Persuasion	Dr. J.N. Kwasu	96
17.	Evaluation of Instruction: Providing Formative and Summative Tools for Decision-Making in Ensuring Educational Progress in Nigeria	Dr. (Mrs) Anthonia O. Clark	102
18.	The Role of Misconceptions as Barrier to Effective Learning in Science	Binta A. Muhammad (Mrs)	111
19.	Effect of Planting Date on Incidence and Severity of Sorghum Anthracnose in the Northern Guinea Savanna of Nigeria	Kalu, U. Ukpai	116
20.	The Tasks of Librarian in Digital Era	Atte, S. Lola (Mrs)	122
21.	Analysis of Micro-Credit and Agricultural Productivity of Rural Farmers in Dekina Local Government Area of Kogi State, Nigeria	Adama, I. Joseph	130 *
22.	Social Studies Education as an Enabling Tool for Women Empowerment	Rana Parveen Khan Dr. M.C. Ubah & Dr. H.I. Bayero	136
23.	Improving Pre-Service Teachers' Problem-Solving Performance and Interest In Circuit Theory Using Stepwise Instructional Strategy	Bappah A.S. and Ahmad A.D.	141
24.	A Comparative Study of Hair Perming and Hair Braiding among Female Students of Ahmadu Bello University Zaria: Prospects for Entrepreneurship	Oduze, Ivy I., Z Gaminana, H. Abdullahi, B. Mohammed & P. Obazelu	147
25.	A Survey of the Feedback Channels used by Agricultural Science Teachers to Evaluate Teaching in Gombe State Secondary Schools, Nigeria	Egunsola, A.O.E (Ph.D) & Oguntunde, G.A. (Ph.D)	155
26.	Secondary School Administration in Nigeria: An Overview on Hierarchy and Functions	Dr. B.A. Maina & Abubakar M. Jumare	164
27.	Student Participation in Students Union Governance and Academic Performance	Dr (Mrs) Felicia I. Ofoegbu	176
28.	Educational Qualification Demography and Personality of Vocational Agriculture Teachers in Gombe State, Nigeria	Egunsola, A.O.E. & Ndomi, B.M.	184
29.	The Role of Christian Youths in Nation Building	Oliver I. Bongotons (Ph.D) & Rev. Fr. John D. Ahashiva	192

ANALYSIS OF MICROCREDIT AND AGRICULTURAL PRODUCTIVITY OF RURAL FARMERS IN  
DEKINA LOCAL GOVERNMENT AREA OF KOGI STATE, NIGERIA

BY

Adama . I. Joseph

Department of economics,

Ahmadu Bello University, Zaria.

E-mail: josephadama2009@hotmail.com

**Abstract:**

Microcredit has recorded tremendous success in reducing poverty on a global scale. As a proficient financial mechanism, microcredit has the potential to enable various governmental and non-governmental actors to achieve the millennium development goals. Based on the field research on micro credit in the rural farming communities in Dekina division of Kogi State, Nigeria, this paper examines and analyzes the significance of microcredit in enhancing agricultural productivity in the study area. The study made use of Cobb Douglas production functions which was fitted into the ordinary least square regression model. The estimated regression equation reveals that access to microcredit could have vision in improving the productivity of farmers and contributing to elevating the livelihoods of underprivileged rural farming communities. However, the farmers needed to be judicious at the utilization of credit facilities in order to realize the goal of output maximization. The study revealed that, those who benefit from microcredit in the study area were more productive than those who do not benefit.

*Key words: Microcredit, beneficial and non beneficial, Productivity, Rural Farmers,*

**Introduction**

In the developing countries like Nigeria, micro credits play a vital role in poverty reduction. Many poor countries and development oriented agencies such as private, bilateral and multilateral institutions are involved in the promotion of microfinance programs in so many forms. Many success are attributed to impact of micro finance which seems wonder to many outside observer as to the numerous range of the benefits claimed. With an estimated 1.3 billion people of the world living on incomes of less than \$1 a day (Nosiru, M.O 2010), the government of the poor countries, especially the sub-Saharan Africa where the majority of the world's poor live, face enormous challenge to reduce poverty. The availability of microfinance generally defined as the provision of financial service such as saving and credit services to the rural poor household is very essential though not a sufficient condition for poverty eradication. (Nosiru, M .O, 2010) However, micro credits play a crucial role in promoting the productive use of farm inputs and creates an enabling environment for increasing agricultural productivity of subsistence farmers. Microcredit is very important in raising productivity of rural community mostly agriculture. In a growing economy microcredit serves

as a good transmission mechanism of benefits of growth faster and equitable using the informal sector. Empirical evidence has shown that, many subsistence farmers lack access to finance which serves as a one of the major constraint to expansion or the establishment of a sustainable agricultural enterprises. To increase their level of productivity as well as financing a wide range of activities that add value to agricultural output, farmers need to purchase inputs with the help of microfinance Access to saving facilities also play a crucial role in making the poor to reduce their consumption expenditures thereby financing investments that improve productivity in agriculture and other productive economic activities. Thus, much is expected to be done to involved microfinance fully in the main affairs of rural financial systems by enabling commercial banks to realize their potential.

**Justification for the study**

More than 65% of Nigeria citizens live below the poverty line and are mostly resided in the rural areas in Nigeria. Majority of the rural poor do not have access to institutional finance, simply because they are regarded as credit unworthy. As such, they are unable to borrow from banks or other credit institutions. Loans are provided by other informal

money markets which includes the traditional money lenders but this loans are given with high interest rate charges. This provides the basis for micro credits to operate for the benefits of the rural poor.

#### **Objectives of the study:**

The broad objective of this study is to examine socio-economic characteristics responsible for the productivity of rural farmers in the study area. Other objectives include, determining the productivity differentials that exist between those who benefits from the microcredit and the non beneficial, and also to examine the difference in access to agricultural resources between those who benefits and those who does not benefits.

Therefore, the paper is divided into five sections. Section 1 is introduction, section 2 is literature review, section 3 is methodology, section 4 is presentation of results and discussion and section 5 is conclusion and recommendations.

#### **Literature Review**

The world outlook regarding the coverage of microcredit provides the contributions that the program has made. A total of 2186 microfinance institutions have been reported to have reached 54.9 million clients with a current loan, 26.8 million of whom were among the poorest when they started with the program. Out of the 2186 institutions that had reported to the microcredit summit campaign, 1075 are in Asia, 740 are in Africa, 230 are in latin America and the caribbean, 59 are in North America, 59 are in Europe and 23 of them are in the middle East. Out of the total world clients of 54.9 million, 49.7 million are from Asia, 4.5 million are from Africa and 2 million are from latin America and the caribbean (Nosiru, M .O 2010). Among stakeholders such as government, central banks, micro finance service providers and other external funding agencies in some countries, a sustainable delivery of microcredit service on a large scale has generated a tremendous positive change and development

According to Nosiru, M,O study has also shown that, among the poor in the society those patronize the micro finance programs were able to improve in their living standard as they were able to have access to financial service than those who do not participate or have access to financial service. These was revealed among the Consultative group to assist the poor (CGAP) in Bangladesh that, house hold expenditures increased by 28% and assets by 112% due to participation in Bangladesh rural advancement committee's microcredit program. More also it was

discovered that after eight years of fund borrowing, 57.5% of those who borrow from Grameen were no more as poor to non borrower household that constitute about 18%. In Lombok, Indonesia 90% of household graduated out of poverty as borrowers increased by 112%. Save the children clients in vietnam also reduce food shortage to one month from three months.

Furthermore in Bangladesh a close survey has revealed that of 1,300 clients and non clients, borrowers of credit were largely more empowered than non borrowers of credit in relation to mobility, control and ownership of productive assets (land inclusive), they are also involved extensively in decision making and creating both legal and political awareness.

Evidence from World Bank (1998), has also shown that micro credit has a tremendous impact on the condition of the borrowers. A study of Grameen Bank and Bangladesh Rural Development Board (BRDB) has also revealed that, household worth net and per capita expenditure increases as a result of micro credit for participants of these programs. A wide range of research by BRAC on the impact of poverty has revealed that 52% of household member of BRAC found themselves below the poverty line while 69% was lying above the poverty line. The study also revealed that there was a remarkable improvements in conditions such as wealth, value of household structures, the level of cash earned, revenue earning assets, per capita expenditure on food and overall household expenditures.

#### **Methodology**

##### **a. The Study Area**

Dekina Local Government Area of Kogi State is a typical rural setting. Most of the settlements in this area are predominantly rural in nature and the major occupation of the people living in the rural areas is farming activities on part time or full time situation. It is an area where some rural villages have no access road and other infrastructural facilities. Geographically, Dekina L.G.A is located between Latitudes 6.50N and 7.00N and Longitudes 6.50E and 7.00E of North Central Zone of Nigeria. Dekina L.G.A is along the Western bank of River Niger. In the area, 80– 90% of the population are farmers. The area produces about 40% of the food crop requirement of Kogi State of Nigeria. Unfortunately farmers in the area have continued to remain poor. This typical nature was responsible for why Dekina Local Government was picked as a reference point for the study.

b. **Sampling Procedure:** This study made use of 120 small scale farmers from Odu and Abocho district whose major crop production is beans. This consists of 50 farmers who benefited from micro credit and 70 farmers who are non beneficiaries of the micro credit. The farmers were selected by the use of simple random sampling method.

c. **Techniques of analysis:** The data employed for this study were collected during the 2009/2010 cropping season. The basic procedure for data collection was through a well structured questionnaire. In order to meet the objectives of this study descriptive statistics, multiple regression analysis, the chow test and the test for difference between means were used. The descriptive statistics were used mainly to present the socio-economic factors such as the age of the farmer, household size. Education, farm size, experience in farming, credit facilities. Also, average input and output of the two farmers group were compared using descriptive method. The determination of socio-economic characteristics of the farmers responsible for productivity was fitted through the use of multiple regression analysis. Furthermore the cobb Douglas production function was fitted to compare the factors responsible for beans production among the subsistence farmers. Therefore the OLS regression model can be expressed as shown below:

$$Q = F(x_1, x_2, x_3, x_4, x_5, D) \text{-----1}$$

$$Q = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + \mu \text{-----2}$$

Where Q = output of beans (bags);  
 $x_1$  = Age (years)  
 $x_2$  = sex (using dummy male = 1, female = 0);

$x_3$  = household size;  
 $x_4$  = level of education (in years);  
 $x_5$  = nature of farming (using the dummy full time = 1; others = 0; and  
 $x_6$  = years of farming experience; while  $\mu$  is the disturbances term. And  $b_i$ 's are the coefficients to be estimated.

The cobb Douglas production function used to estimate the micro credit for non beneficiaries could be expressed as

$$L_n Q = \ln A + a_1 \ln X_1 + a_2 \ln X_2 + a_3 \ln X_3 + a_4 \ln X_4 + \text{-----3}$$

For those who benefits from micro credit the production function could be fitted a

$$L_n Q = \ln B + b_1 \ln X_1 + b_2 \ln X_2 + a_3 \ln X_3 + a_4 \ln X_4 + \text{-----4}$$

Where we define  $X_1$  as land in hectares;  $X_2$  is labour per man day;  $X_3$  is capital in naira and  $X_4$  is materials in naira.

Both beneficiaries and non beneficiaries of micro credit combined together, the model could be expressed as using dummy variable,

$$Q = F(X_1, X_2, X_3, X_4, X_5; D) \text{-----5}$$

Where  $X_5$  is the amount of credit in naira and D is the dummy variable as credit available is denoted as 1 and others as 0

The second objective would be achieved using the three equations as above, and to determine the productivity differentials between those who benefit and non beneficiaries of micro credit the chow test would be used on the three set equations. The t-test was used to test the hypotheses and the difference of means of the two groups of farmer.

**Presentation of Results and Discussion**

Table 1: Socio-economic characteristics of the sampled farmer in the study area:

Socio-economic characteristics	Those who benefit from micro credits n=50	Those who do not benefit from micro credit n= 70	Average where n= 120.
Sex-Male	29	43	
Female	21	37	
Age	50.43	48.04	49.24
Education	16.32	14.40	15.01
Household size	10.03	9.04	9.01
Hired labour	273.03	266.02	268.01
Family labour	270.02	245.20	254.03
Farm size	2.24	2.69	2.53
Farming experience	20.03	20.13	20.03
Labour	543.05	511.22	522.22
Herbicide	2.34	2.89	2.70
Capital	22069.40	75310.03	56971.30
Credit	40258.06	0.00	14194.8
Revenue	135403.42	130661.30	133770.05
Output	232.75	230.53	231.15

Source, Field survey 2010

Table 2: Indices for comparative analysis of the productivity measure of beneficial and non beneficial of micro credits

Productivity	The beneficial, n=50	Non beneficial, n=70	The
Output per hectare (bag/ha)	87.08	109.25	0.81
Output per labour (bag/kg)	0.83	0.81	0.81
Output per herbicides (bag/litre)	65.03	89.02	0.81
Output per equity (bag/Naira)	0.007	0.009	0.009

Source: Field survey, 2010.

Table 3: The providers of micro credit to the farmer that are beneficiary in the study area

Provider of credit	Number of the beneficial	percentage of the beneficial
Money lenders	11	22
Relatives	19	38
Farmers cooperative societies	13	26
Friends	7	14
Total	50	100

Source: Field Survey 2010.

**Model 1:** Socio- economic factors affecting productivity of farmer in the study area:

$$\ln Q = 74.0822 - 0.25172 \ln X_1 + 26.7610 \ln X_2 + 16.8542 \ln X_3 - 1.8654 \ln X_4 + 86.7492 \ln X_5 + 0.5840 \ln X_6$$

(92.788082) (1.903409) (25.320108)  
(9.790013) (2.813231) (29.527596)

At - 10% level of significance and - 1% level of significance

The most important socio- economic factors of the sampled farmers within the study area comprises of the farming character adopted (which is significant at 1%) and the size of household (which is also significant at 10%). The character of farming adopted whereby a farmer who is a full time farmer is denoted with a score 1 otherwise he will be denoted 0. The result indicated that full time farmers are more productive than part time farmers. Most household member of the family are mostly used as source of labour thereby contributing to improvement in the level of productivity. Also the result shows the rest socio economic factors such as sex, age, educational qualification and farming experience. From the result one can disclosed that the young farmers are more productive than the older farmers. Sex was denoted with a dummy variable where a male farmer was assign with 1 and a female was assign with 0, and its measurement shows that male farmers are more productive than the female farmers in the study area. The number of years of farming seems to be there as socio economic characteristic for measuring the level of productivity in the study area.

**Model 2:** Determinants of productivity of the selected farmers that does not benefit from the micro credit giving the production function.

$$\ln Q = 1.2483 + 0.39472 \ln X_1^{xxx} - 0.1401 \ln X_2 + 0.2502 \ln X_3^{xx} + 0.1754 \ln X_4 \text{-----} 7$$

(1.533040) (0.147210) (0.127839)  
(0.010073) (0.116820)

Note that, xx is - 5% level of significance and xxx is - 1% level of significance.

In the result above, capital and size of land major important variables that determine the productivity of selected farmers in the study area; the two variables has 5% and 1% level of significance. Smaller farm land and higher capital outlay has proven to be an important variable among those who does not benefit from micro credits. Also in labour it can be observed that, there was over- utilization of labour input among the non beneficial of micro credit. Productivity was also encouraged by cost of materials used in the cultivation.

**Model 3:** Determinants of productivity of the selected farmers who are beneficiaries of micro credit giving the production function.

$$\ln Q = 1.9825 + 0.2768 \ln X_1^{xx} + 0.3523 \ln X_2 + 0.0214 \ln X_3 + 0.0832 \ln X_4 \text{-----} 8$$

(0.382710) (0.202586) (0.1725661)  
(0.022015) (0.109112)

Note that, xx is - 5% level of significance.

The above result shows that, labour is one of the major important inputs used among the selected farmers that are beneficiary of micro credits in the study area. We can observe that the labour input is significant at 5% level of significance. Therefore, we can say that increase in labour input would lead to increase in productivity among the selected farmers who are beneficiary of micro credit. Other variables such as land capital and cost of materials, an eventual increase in each of these inputs will equally result to an increase in the productivity of the farm crops.

**Model 4:** Determinants of productivity of the selected farmers who are beneficiary and non beneficiary of micro credit giving the production function.

$$\ln Q = 2.7336^{xxx} + 0.4067 \ln X_1^{xxx} + 0.1021 \ln X_2 + 0.0150 \ln X_3 + 0.1349 \ln X_4 + 0.3780 \ln X_5 + 0.0089 \ln X_6$$

(1.001685) (0.122033) (0.095000)  
(0.022395) (0.081690) (1.285598)  
(0.129128).

Production function for all the selected farmers that are beneficiaries and non beneficiaries of micro credits are as shown above. It can be observed that land and cost of materials are most important variables among the selected farmers. Land size and cost of material has 1% and 10% level of significance respectively. It could be predicted that increase in the level of the two variables would also lead to an improved level of productivity among the selected farmers in the study area. More also an increase in capital and labour inputs would also lead to an increase in the level of production. Furthermore, access to credits by the farmer was measured using a dummy variable with a score of 1 for access to credit and 0 to no access. From the above result one could observed that access to credits contributed immensely to increase in productivity of farmers in the study area but the amount of credits given to these farmers seems not to have made meaningful contributions to the level of productivity of farmers in the study area. This scenario could be attributed to ineffective utilization of the credit or the use of the credit for other activities which the credit was not meant for apart from farm activities.

**The Chow Test**

The essence of this test is to find out if there was a significance difference in the productivity of the two groups of farmer, that is, the beneficiaries and the non beneficiaries.

The chow test statistic is given as

$$F = \frac{(RSS_1 + RSS_2)/k}{RSS_1 + RSS_2/n - 2k}$$

Where F distribution is given with K and n - 2k degree of freedom

The F value calculated was 44.0093, and the tabulated F value was 2.21; the F calculated is greater than the critical value as such, it could be deduced that, there exist a statistical difference in the level of productivity of the two groups of farmer. Conclusion could be drawn that, the beneficiaries of micro credits were more productive with regard to productive inputs like land, capital and planting materials, herbicides than farmers that are non beneficiaries of micro credits in the study area.

**The findings of this study**

◊ Those groups of farmer that benefit from micro credits are to some extent more productive with the use of productive farm inputs such as land, herbicides, capital and other planting materials than those who does not have access to credit facilities.

◊ Majority of the credits was given by farmer cooperative societies, relatives and micro finance



banks. None of the farmers selected in the study area had access to credits from commercial banks.

◇ Household size contributed immensely to the productivity of farmers with large household than smaller household as large household made use of the labour of their member as a source of labour input.

◇ Full time farmers are more productive than part time farmers.

◇ Size of land and capital were the most important variables used by the non beneficiaries of micro credits, where as labour input was discovered to be most crucial variable among the beneficiaries of micro credits in the study area.

◇ Improved level of production and productivity of the farmers was facilitated by easy access to micro credits but judicious utilization of the credit facilities was not justifiable as they would have expand more in their productive capacity than the non beneficiaries of the credit facilities.

◇ There was no significant difference between the two groups of farmer with respect to output But significant differences exist between the two groups with respect to labour inputs, the use of herbicides and acquisition of planting materials.

### 5.0 Conclusion and Recommendation.

It could be observed from the study that those who benefits from micro credits were not as productive as anticipated even though they had the capability to be more productive than the level they were at the time of this study. To increase the level of productivity of the two groups of farmer in the study area, the following measures are suggested.

The non beneficiary farmers should make maximum use of available means within their environment by becoming a member of farmer's cooperative societies in their communities so as to acquire the needed capital for crop production. This would enable them to have access to credit facilities through the cooperatives. Individual too can also take advantage of relatives that are buoyant enough and financially fit to be able to give loan to farmers for productive activities.

It is of great importance if the non beneficiaries could reduce their labour input while the beneficiaries of the micro credits increases their labour input in order to boost farm productivity.

The credit facilities given to the beneficiaries should be adequately and judiciously utilized within their

reach rather than diverting it to other activities which the credit was not meant for.

Structure should be established by the cooperative societies and other micro finance institutions to monitor and ensure credit facilities are judiciously utilized so as to avoid loan default.

Both commercial and micro finance banks should also made it public to the farmers their product available in form of provision of loan to subsistence farmers through farmer cooperative societies and also put in place structures that would monitor careful utilization of the credits for farm productive enterprises and easy repayment without much default.

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