



IMPACT OF FINANCIAL SERVICE ASSOCIATIONS' CREDIT SCHEME ON INCOME OF BENEFICIARY FARMERS IN KATSINA STATE NIGERIA

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ABSTRACT

The study examined the impact of FSAs' credit scheme on beneficiary farmer's income in Katsina State, Nigeria. Primary data were collected from two categories of farmers; beneficiaries and non-beneficiaries of Financial Service Associations' (FSAs) credit scheme with the aid of structured questionnaire and interview method. A multi-stage sampling procedure was adopted and slovin's formula to obtain the sample size from the four Local Government Areas (LGAs): Bakori, Danja, Funtua and Malumfashi. The data were analyzed using Descriptive statistics such as percentage, frequency etc. and inferential statistics such as Propensity Score Matching (PSM) model. The results from PSM estimator revealed that FSAs' credit scheme had a positive and statistically significant impact on the income of beneficiary farmers. The Radius matching (0.50) shows that an increase of N21, 158.360 and Kernel Matching shows an increase of N11, 977.580 on average was achieved, by beneficiary farmers who benefited from the scheme. The study revealed that there is a positive and significant impact of the loan scheme on the income of the beneficiaries in the study area at one percent level. There is a need to linking FSAs with formal financial institutions, the provision of adequate amount of loan and timely disbursement of funds to improve loan utilization by the beneficiary farmers. There is also the need to improve the administrative and management processes of the associations. The loan should be monitored by relevant bodies for effective utilization in agricultural production and other economic activities to avoid diversion of funds to consumption activities and miss-used of loan to low income generating enterprises.

Keywords: Beneficiaries; Credit; FSA; Impact and Income

INTRODUCTION

The crucial role played by credit in improving productivity and performance of the agricultural sector has gained considerable attention in the literature and empirical studies Kareem *et al.*, (2013), Awotide, Abdoulaye, Alene and Manyong, (2015), Idi *et al.*, (2019) Ojo and Ayanwale, (2019) Mathew *et al.*, (2019) and Osabohien, Mordi and Ogundipe, (2020) among others. The Federal Government in recognition of the credit need of farmers established several institutions, interventions and programmes aimed at increasing income, reducing poverty and attracting smallholder farmers to agricultural practices across the value chain. Some of these agricultural programmes have been developed and executed by successive administrations in Nigeria from early 60s to date. According to the World Bank (2009); Badiru (2010) and Olowu (2011), the major credit institutions established by law and which can be influenced by government policies to provide farm credit for agricultural growth and development in Nigeria are Bank of Agriculture (BOA), Commercial Banks, international development agencies, state government owned-credit institutions, Microfinance Banks, Financial cooperatives, among others. While the major agricultural financing schemes were the Agricultural Credit Guarantee Scheme Fund (ACGSF) and the Agricultural Credit Support Scheme (ACSS). And recently, programmes like, Rural Finance Institution-Building programme (RUFIN) and Anchor Borrowers of CBN were also introduced among others.

This means that farmers have to depend on various financial agencies for acquiring funds to expand their agricultural

productions and investments. In this regard, International Fund for Agricultural Development-Financial Service Associations (IFAD-FSAs) provides such financial assistances to its respective members in form of credits or savings. It relies on members share capital as the main source of funds (International Funds for Agricultural Developments-Climate change Adaption and Agribusiness Support Program (IFAD-CASP), 2017). Financial Services Associations are a microfinance model invented and first developed by International Funds for Agricultural Development (IFAD) in 1997 whose approach is the provision of financial services through rural banking. The Financial Service Associations' (FSAs) credit was designed to help less-privileged and marginalized poor farmers to have access to credit to develop and finance farm production and other income-generating activities. International Funds for Agricultural Development (IFAD) contributed to financing projects and there is an increase in the number of financial institutions so as to change the slow pace of agricultural and rural development in the study area and country as whole. But in spite of all the concerted efforts being made, rural farmers still experience low income and decrease in production, difficulty in accessing loan and also increase in poverty remains to be a challenge in Nigeria. Despite all of these programmes and interventions majority of the rural small scale farmers are unable to either meet their day-to-day requirements from their own sources of income or invest in other productive enterprises for improving their living standard and economic conditions. Agriculture continues to be a fundamental instrument for sustainable development and poverty

reduction; yet, financial constraints in the sector remain pervasive, agriculture remains costly and finances inequitably distributed, severely limiting small holders' ability to compete (Bee, 2007; World Bank, 2013).

Furthermore, a lot of poor rural farmers in Nigeria live without adequate food, income, health facilities and shelter. Therefore, savings and borrowing small amount can make a significant difference in their lives. Farm credits are important means for improving farm capital investment without which there may be no progress in the agricultural sector to adequately fulfill its expected roles (Musa et al., 2010). This means that farmers have to depend on various financial agencies for acquiring funds to expand their agricultural productions and investments. In this regard, International Fund for Agricultural Development-Financial Service Associations (IFAD-FSAs) provides such financial assistances to its respective members in form of credits or savings. Therefore, considering role of credit as a crucial factor in changing the slow face of agriculture and rural development to attain sustainable development in the sector, it is necessary IFAD and FSAs to find ways to strengthen and link the FSAs with formal financial institutions that would expand credit delivery and its availability in which beneficiary farmers can access credit with less difficulty. . Furthermore, this study is also justifiable because it generate data that revealed the impact of FSAs' credit schemes that will enable policy makers to come up with appropriate interventions on credit. Finally, the study will also enable policy makers to design appropriate policies that bring about effective program participation through informed decisions on how to promote IFAD and FSAs practices within the study area and beyond.

This research work greatly enable policy makers to identify constrains facing FSAs and also identify issues which may bring about creating policies aimed at reducing rate of loan default in the study area. Also, it clearly reveals the comprehensive knowledge about the outcome of FSAs services which includes the extent to which FSAs loans, saving mobilization has enabled growth of investments and income, self-employment and improved social services in the study area. The research examine the extent to which FSAs

have contributed towards increasing farmers' income, their standard of living and further allow the IFAD to maximize coverage, strengthening FSAs. Therefore, assessing the impact of FSAs on the benefiting farmers can provide essential information to not only policy makers and agricultural financing agencies but also farmers and general public alike. Finally, the result is hoped contribute equally to the general body of knowledge and provide basis for future research studies, planning and development process.

METHODOLOGY

Study Area

Bakori and Danja Local Government Areas are the study area. Bakori LGA is geographically between latitude 11° 33' 20.12" North and longitude 7° 25' 27.08" East. It has a land area of about 679 km² (262 sq. mi.). It has a projected population of 1,006,183 with 3% as the growth rate in the year 2021. Danja LGA is geographically located between latitude 12° 2' 54" North and longitude 8° 44' 50" East covering a land area of about 501 km² (193 sq. mi.) with projected population for 2021 of about 1, 97,142 people at 3% growth rate. Both areas are characterized by dry and wet seasons with an average rainfall of about 900 to 1000mm and minimum and maximum temperatures of 19°C and 37°C, respectively.

Sampling Procedure, Sample Size and Data Collection

A multistage sampling procedure was adopted for this study. The first stage involved purposive selection of Bakori and Danja LGAs, selected based on the fact that they are among the LGAs participating in IFAD programme and presence of FSAs in their village communities (VAs) out of which three Village Areas are purposively selected. And then two non-participating LGAs are randomly selected to serve as control group. Thereafter, the slovin's formula was used to get the sample size from of the sampling frame, from the list of Beneficiary and non-beneficiary farmers obtained from the respective IFAD-FSAs offices and KTARDA offices in the study area. Resulting in a total number of 510 respondents for the entire study as illustrated in Table 1. Primary data were collected with structured questionnaires administered on both beneficiaries and non-beneficiaries of FSAs with the help of trained enumerators.

Table 1: Sampling frame and Sample size distribution of the respondents

Selected Areas		Beneficiaries		Selected Areas		Non-beneficiaries	
Sampling Frame		Sample size		Sampling Frame		Sample size	
BAKORI				FUNTUA			
Jargaba	125	47	Dikke	112	39		
Kakumi	103	39	Gwaigwaye	135	47		
Gazara	110	41	Gardawa	121	42		
DANJA				MALUMFASHI			
Tandama	121	45	Tashar Fulani	114	39		
Tsangamawa	97	36	Karfi	142	49		
Kahutu	109	41	Layin Minista	130	45		
Total	665	249		754	261		

Source: IFAD, FSAs and KTARDA, September, 2019

Analytical Techniques

Descriptive statistics such as frequency, percentage, mean, standard deviation and also inferential statistics were used such as PSM. PSM was used to examine the impact of FSAs credit scheme it utilization on beneficiary farmers' income in Katsina State. The estimated propensity scores are used to estimate the Average Treatment Effect on the Treated (ATT) which was the parameter of interest. The logit empirical model is specified as

$$P_i = \frac{e^{Y_i}}{1 + e^{Y_i}} \dots \dots \dots (2)$$

Where: P_{ij} = probability of falling into treatment or control group Given by:

$$P_i = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 \dots \dots \dots \beta_n X_n + \mu_i \dots \dots \dots (3)$$

$$Y_i = \begin{cases} -x, & x < 0 = \text{control (Non - beneficiary)} \\ x, & x \geq 0 = \text{treatment (Beneficiary)} \end{cases}$$

The research further measured the impact of the program on those farmers who benefited i.e. the average treatment effect on the treated (ATT) which is the parameter of interest in PSM analysis (Becker and Ichino, 2002)

Average Treatment Effect on the treated (ATT)

$$ATT = \frac{1}{N_t} [\sum_{i \in T} Y_j^t - \sum_{j \in T} w_{ij} Y_j^c] \dots \dots \dots (4)$$

where; ATT = Impact of FSAs credit on beneficiary farmer, N_t= Number of beneficiary farmers
 Y_j^t= Income of beneficiary farmers (treated) Y_j^c= Income of non-beneficiary (Control), W_{ij}= weight and j = Identifier.
 Y = Amount of loan obtained (Naira), X₁ = Age (Years), X₂ = House hold size X₃ = Years in Education level in (Number of years), X₄ = Year of farming experience (Number of years), X₅ = Farm size (Number of Hectares), X₆ = Marital status (0 = Single, 1 = Married, 2 = Divorced, 3 = Widowed), X₇ = Monthly income (Amount in Naira), α = Constant, β₁ ----- β_n = Logit Regression co-efficient of X₁ ----- X_n to be estimated and μ_i = Error term.

The study used more than one matching algorithms to ensure robustness of the impact’s result. Each matching algorithm to estimate the outcome variable was repeated 200 times with bootstrapping in order to reduce the sample errors and reduces bias. Thus, in this study we present the extent of bias between beneficiaries and non-beneficiaries, number of matched control followed by the estimation of the propensity score and finally the impact’s results.

RESULTS AND DISCUSSION

Socio-Economic Characteristics of the respondents in the study area

Table 2 below gives the summary the socio-economic characteristics of beneficiaries and non-beneficiaries of FSAs’ credit scheme in Katsina State, Nigeria. Majority of the beneficiary respondents in the study area were male 61.90% and 38.10 % were female. This implies that both sexes were adequately represented from FSAs’ credit scheme, with slight variation in favor of male respondents in the study area. The mean age of the beneficiary farmers was found to be approximately 41 years. The average age of non-beneficiaries was found to be approximately 43 years. This implies that a large number of the respondents were young, active and are within agricultural productive age range as observed by Food and Agricultural Organization (FAO) (2005) on agricultural productive age range. The average house hold size for both sampled respondents was found to be 11 members. The

implication of this is that majority of the respondents had dependents to take care of and can make use of members of the household to provide farm labour to reduce cost of production as observed by Husaini et al. (2020). The average farm size was found to be 1.79 hectares for beneficiary while 1.93 hectares for non-beneficiary. This implies that majority of the beneficiary respondents are within the subsistence level of farming. The result concurs with the findings of Salau et al. (2013) who affirmed that majority of small-scale farmers had between 1-5 hectares. Majority 43.44% of the beneficiaries had secondary education and 10.66% had tertiary education. While, 33.86% of non-beneficiaries had primary education, 26.38% had secondary and education. This implies majority of the respondents are literate and generally have positive attitude toward accepting new innovation and development initiatives as affirmed by Farinde et al. (2005).

Table 2: Distribution of respondents’ socio-economic characteristics

S.E.V.	Beneficiaries		Non-Beneficiaries		
	Frequency	Percentage (%)	Frequency	Percentage (%)	
Sex					
Female	93	38.10	51	20.10	
Male	151	61.90	203	79.90	
Age					
25-35	76	31.10	Mean 31	12.20	Mean
36-45	119	48.80	40.65	47.20	43.42
46-55	30	12.30	S.D 94	37.00	S.D
>55	19	7.80	10.02	3.50	6.96
Household size					
1-5	25	10.25	Mean 40	15.75	Mean
6-10	136	55.74	11	47.64	11
11-15	38	15.57	S.D. 59	23.22	S.D.
> 15	45	18.44	6.08	13.39	5.38
Level of education					
Non-formal education	4	1.64	9	3.54	
Primary education	32	13.11	86	33.86	
Secondary education	106	43.44	67	26.38	
Tertiary education	26	10.66	40	15.75	
Qur’anic education	76	31.15	52	20.47	
Farm size					
0.5-1	107	43.85	92	36.22	
1.5-2	63	25.82	Mean 76	29.92	Mean
2.5-3	34	13.93	1.79	12.60	1.93
3.5-4	27	11.07	S.D. 45	17.72	S.D.
> 4	13	5.33	1.13	3.54	
Extension contact					
1-5	117	47.95	Mean 88	34.64	Mean
6-10	98	40.16	5	39.76	5
>10	29	11.89	S.D. 65	25.60	S.D.
			2.32		2.75

Source: Field Survey (2019), S.D. = Standard Deviation and S.E.V. = Socio-Economic Variables

Impact of FSAs’ credit scheme on beneficiary Farmers’ income in Katsina State

Table 3 presents the difference between the income of beneficiaries and the non-beneficiaries based on the mean values of their selected socio-economic characteristics and the extent of standard bias reduction. Four matching algorithms were considered as the maintained hypothesis and then seven statistics: the number of control matched, ATT, Standardized Bias reduction (SPB), standard error before and after bootstrapping and t-value were retained for the evaluation of the impact of FSAs’ credit scheme between the treated and the control respondents after matching based on the matching algorithms in the study. For impact estimation to be robust as much as possible, four of the matching algorithms were used in this study as shown in Table 3 Each matching algorithm to estimate the outcome variable (dependent variable) was repeated 50 times with bootstrapping in order to reduce the sample errors and reduces bias. Four of the matching algorithms were used to estimate the impact of FSAs credit on beneficiaries’ income. These are; nearness neighbor matching, kernel matching, radius matching and stratified matching. The result of ATT for matching algorithms in Table 3 implies the average gain from the loan to a beneficiary farmer randomly drawn from the beneficiary farmers rather than to any member of the population. For impact estimation to be robust as much as possible, four of the matching algorithms were used in this study as shown in Table 3 Each matching algorithm to estimate the outcome variable (dependent variable) was repeated 50 times with

bootstrapping in order to reduce the sample errors and reduces bias.

The result of the radius (0.50) matching showed that ₦21, 158.360 was the difference in income after comparing between beneficiary and non-beneficiary farmers. This implies an additional of ₦21, 158.360. The results concur with the findings of Idi *et al.* (2019) who confirmed that micro-finance credit increases famers’ output which consequently increases their income level.

The result showed that nearness neighbor matching had difference of ₦10, 225.410 between the beneficiaries and non-beneficiaries. Implying that benefiting respondents have ₦10, 225.410 more income compared to non-benefiting respondents. This result is in line with the findings of Hussain (2012) who reported that credit beneficiaries had increased income compared to non-beneficiaries.

On the other hand Kernel matching indicated a difference of ₦11, 977.580 after comparing beneficiaries with non-beneficiaries respondents. The result implies that beneficiaries have ₦11, 977.580 increased in their income than non-beneficiaries. This result is in line with findings of Dadson *et al.* (2012) who reported that credit beneficiaries had increased income compared to non-beneficiaries.

Similarly, Table 3 shows that, the result from stratified matching algorithm presented a difference of ₦10, 532.189 after matching beneficiary with non-beneficiary respondents. This connotes that FSAs’ credit scheme had significant impact on the income of beneficiary farmers. The result agrees with the findings of Zahran *et al.* (2016) who reported positive credit impact on credit beneficiaries’ income compared to non-beneficiaries.

Table 3: Result of Propensity Score Matching on the impact of FSAs’ credit on beneficiary farmers

Matching Algorithms	Number of Treatment	Number of Control Matched	ATT	S. E. Before Bootstrap	S. E. After Bootstrap	Standardized Bias Reduction	t-value
Nearest Neighbor	244	101	10225.410***	2612.326	2400.061	268.7154	4.260
Radius (0.50)	244	242	21158.360***	1270.428	1306.389	24.21168	16.196
Kernel	244	242	11977.580***	1933.0233	1957.235	43.31236	6.408
Stratified	244	242	10532.189***	1841.372	1901.389	69.08409	5.540

Source: Field Survey (2019), $P > |z| = 0.000$ *** = 1% level Significance, S. E= standard error and ATT= average treatment on the treated.

Test of Hypothesis

It was hypothesized that FSAs’ credit scheme have no significant impact on beneficiary farmers’ income. The result in Table 3 presented above depicted that the credit has positive impact on beneficiary farmers’ income. As indicated by radius (0.50) matching with an increase of ₦21, 158.36 and kernel matching with an increase of ₦11, 977.580 for beneficiaries’ income compared to non-beneficiaries. Therefore, the null hypothesis is rejected and alternative hypothesis is accepted.

Constraints associated with loan procurement in the FSAs

Table 4 present the major constraints faced by beneficiaries who associated with loan procurement in FSAs’ credit scheme were the insufficient amount loan; this problem accounted for about 41.80%. This could be attributed the low capital base of the FSAs. As reported in microfinance letter, (2008) that one of the problem facing micro credit institutions in Nigeria include low capital base of the institutions which affect the quantity of credit to be disbursed. This would affect the income earnings and productivity of the loan beneficiaries. While, delay in disbursement of funds, poor leadership and duration of loan were too short. These problems accounted for 23.77%, 13.52% and 10.66% respectively. This implies that some beneficiaries find it difficult to obtain loan from the associations to finance their economic activities in the study area. As observed by Olaitan (2006) that among the problems militating against micro-loan users include delay in disbursement, reluctance on the side of credit official to grant loans among others.

Table 4: Distribution of respondents according to constraints encountered

Constraints	Frequency**	Percentage (%)	Rank
Insufficient amount of loan	102	41.80	1 st
Delay in loan disbursement	58	23.77	2 nd
Duration of loan was too short	33	13.52	3 rd
High borrower transaction cost	26	10.66	4 th
High interest rate	9	3.69	5 th

** = Multiple responses allowed

CONCLUSION

The study revealed that there is statistically significant difference between beneficiaries and non-beneficiaries of FSAs' credit scheme microcredit with respect to socio-economic variables. It was observed that micro-credit had a positive impact on beneficiary farmers' income in the study area. Hence; there is a need to strengthen and link the FSAs with formal financial institutions for the provision of adequate amount of loan which would improve the productivity and income earnings of the farmers. The loan should be monitored by credit officers and relevant financial institutions for effective utilization of loan to avoid diversion to consumption activities or low income generating activities.

RECOMMENDATIONS

Based on the findings, the following recommendations are made:

- i. Since, FSAs' credit scheme had impacted positively on the income level of beneficiary farmers, it is recommended that, the IFAD should strengthen and link the FSAs with Commercial bank and other formal financial institutions in order to expand and replicate the project in IFAD benefiting and other non-benefiting LGAs of the state in order to improve per capital income of farmers within Katsina state.
- ii. Insufficient amount of loan and untimely disbursement of funds by FSAs credit management were found to be the major factors constraining credit acquisition from FSAs' credit scheme in the study area. It is therefore recommended that, the disbursement of funds should be centrally coordinated, with a fixed time for credit application and credit disbursement by all the associations.

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