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IMPACT OF DEVELOPMENT EXCHANGE CENTRE (DEC) MICROCREDIT PROGRAMME ON CROP OUTPUT AND STANDARD OF LIVING AMONG WOMEN FARMERS IN KADUNA STATE, NIGERIA

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ABSTRACT
This study examined the impact of Development Exchange Centre microcredit programme on crops output and standard of living among women farmers in Kaduna State, Nigeria. A multi-stage sampling method was employed to select 420 respondents. Primary data were collected through the use of questionnaires and were subjected to both descriptive and inferential statistics. The mean farming experience was 22 years for DEC participants and 19 years for non-DEC participants while mean farm size for participants and non-DEC participants was 2.0 ha. Determinant of standard of living on programme participants, the study concludes that, age (0.0405, P<0.01), farm size (47.510, P<0.01), education, credit (0.6031, P< 0.01) and extension contact (0.002, P< 0.01), had direct relationship with the standard of living of programme participants, This implies DEC, increase the standard of living of programme participants in Kaduna State. Determinant of crops output of programme participants shows that, farm size (0.046, P<0.01), credit (0.821, P< 0.01), extension contact (0.0542, P< 0.05). F-chow statistics shows that DEC microcredit had positive impact on crops output of programme participants. Z – statistics also indicated positive impact on living standard of the participants. It was recommended that, DEC microcredit organization should increase the amount of loan disbursement to ₦100, 000, so as to increase participation; extend the repayment period, lowered interest rates and extend the programme to other farming communities in Kaduna State, there by improving the standard of living of women farmers in the state.

Keywords: Impact, DEC, Crops output, Poverty Standard of living, Women farmers.

INTRODUCTION

Government and Non-governmental organization has taken several steps over the years to use agriculture as a vehicle to alleviate poverty and attain food security, yet there is low and declining productivity of Nigeria agricultural sector due to poorly developed irrigation facilities, non-access to funds, inadequate infrastructure, ineffective agricultural research and extension systems, non- availability and poor distribution of key inputs(Fertilizers, chemicals, machinery and improved seeds) (Ajala and Gana, 2015; Nwaobiala, 2019). According to Auta (2004), women in Nigeria produce, process and market about 80% of food, manage 70% of all small scale enterprise and about 33% of all small households which is sustained by women. Their role in agriculture has important implication for development and poverty alleviation, because women constitute a very important segment of the labour needed in production. Yet, despite their contribution to global food security, women farmers are frequently underestimated and overlooked in development strategies.

Impact evaluation refers to as an essential part of the project cycle, and is already well known and widely used in many disciplines. Bottom line issues are generally return on investment for the provider of funds, accountability, and the need for the recipient to be able to justify the case for further funding (Nwalieji *et al*, 2016). Impact studies aim to measure not only the reactions of the beneficiaries and the outputs generated by them, but also the proportion of any perceptible change attributable to the project (Bellamy, 2012). Owen, (2013) describes 'impact evaluation' as evaluation that leads to a decision about the worth of a programme and which often has a strong summative emphasis. This type of evaluation is generally carried out at the end of the programme, or when a programme is at settled phase.

USAID/Nigeria, (2015) revealed that over 65 percent of Nigerians living in extreme poverty are women. Despite various efforts of Government and non-governmental organization to reduce the incidence of poverty and raise their standard of living through different poverty alleviation programmes and strategies, Nigeria continues to be one of the poorest countries in the world (International Fund for Agricultural Development, 2017).

Micro-credit is the small amount of loan usually given to the working poor, most often for the purpose of income generating, employment, agricultural production and raise their standard of living (United Nations 2017, Ilavbarhe, 2015 & Adamu *et al*, 2020. Development Exchange Centre (DEC) is an NGOs, established in 1987 by the Canadian University Services Oversea (CUSO) and Adult Non-Formal Educational Agency, (ANFEA) in Bauchi State. DEC currently covers North-East, North-West and North-Central region of Nigeria. The aim and

objective was to empower women groups to enhance their capacity for sustainable development through the provision of micro finance services (DEC, 2014). DEC Micro-credit programme has provided microcredit services to women in Kaduna State to engage in income-generating activities, such capital which is not easily accessible in the formal banking sector due to the inability of these poor women to provide collateral. The common ventures in which the women invest their loans include crop production, livestock rearing/fattening, grain and petty trading (DEC, 2014).

It is widely assumed that microcredit will have a positive impact on income, agricultural production, nutritional and educational status of household members. Microcredit is also believed to play important role in increasing women's employment in micro enterprises and improving the productivity of women's income generating potentials. Kaduna State being one of the poorest states in the north-west of the country (WB/DFID, 2014, Folorunso,2016), has seen many financial institutions, Non-Governmental Organizations (NGOs), programmes and policies initiated to improved agricultural productivity and alleviate poverty between 1986 and 2010. However, empirical evidence has shown that these interventions have not provide the desired impact on improving agricultural productivity and standard of living among rural women in the state (WB/DFID, 2014, Folorunso,2016). This unfortunate situation appeared to threaten the ability of women to secure sustainable livelihood to guarantee continuous flow of food security, income and standard of living, despite benefiting from microcredit schemes. Studies have been conducted on poverty and impact of poverty alleviation interventions on the Nigerian population. These include Nkonya *et al.* (2008), Kudi *et al*. (2009); Simonyan *et al.* 2015; Yunana *et al.* (2016). However, there is scanty empirical information on the impact of DEC microcredit on women with particular reference to crops output and standard of living in Kaduna State. The main objective of the study was to determine the impact of DEC microcredit on crops output and standard of living among women farmers' in Kaduna State, Nigeria. The specific objectives were to: describe the socio economic characteristics of DEC women participants and non-participants; determinants of crops output among programme participants and non-participants; determinants of standard of living among programme participants and non-participants and identify the constraints encountered among women participants in accessing DEC microcredit programme in the study area.

The hypotheses of the study are stated as follows;
Ho_2: DEC microcredit programme has no significant impact on the crop output of programme participants in the study area.
Ho_2: DEC microcredit programme has no significant impact on the standard of living of programme participants in the study area

METHODOLOGY

The Study Area

This study was conducted in Kaduna State Nigeria. The State occupies 7% of the land area of Nigeria with a surface area of approximately 67,000m^2 and a total land mass of 43,000km^2 of which 20,220km^2 is arable. The State is situated in the North – West geo-political zone of the country at about 200km^2 away from the Federal capital territory Abuja. It is located between latitude 9° 04′to 11° 50′N and longitudes 07° 09′ to 10° 04′E, respectively. It shares boundary with Katsina and Kano States to the north, Plateau State to the North East, Nasarawa State and Federal Capital Territory, Abuja to the South and Niger and Zamfara States to the West. Kaduna State has an estimated population of 6,066,562 (NPC, 2006), out of which the female population is 2,954,534(48.7%) (National Commission for Mass Literacy Adult and Non-Formal Education, 2008). By 2020 the state population is projected to be 9,428,842, at 3.2% growth rate per annum, while the female population will be 4,592,025 at the same growth rate.

Sampling Procedure and Sampling Size.

Multistage sampling technique was used for this study. In the first stage, three Local Government Areas (Sabon-gari, Kaduna south and Jema'a) were randomly selected from the nine LGAs participating in DEC microcredit programme in the state. In the second stage, two villages each were randomly selected from each of the three LGAs. In the third stage, from a sample frame of 2,103 women participating in the DEC programme, 210 subjects, representing 10% were randomly selected. The list of participating women was obtained from the DEC microcredit office in Kaduna. Finally, the list of two hundred and ten (210) non-participant women farmers was also obtained from Kaduna Agricultural Development Project (KADP) extension agent. This was randomly selected to obtain a total sample size of 420 respondents. Primary data were collected through the use of structured questionnaires and interview schedule with the help of trained enumerators. Data collected were subjected to both descriptive and inferential statistics. Descriptive statistics, such as percentages, tables, frequency counts and means were used to achieve objective i. Logit regression model and Ordinary least square (OLS) regression was used to achieve objective ii and iii. Chow–test was used to test hypotheses i, while Z–test was used to test hypotheses (ii).

Logit regression model

Logit regression model was used to achieve objective ii and part of objective (iv). The logit regression model is one of the binary choice models in which a dichotomous regression variable is considered as the dependent variable; this dichotomous variable is related to a set of independent variables that are hypothesized to influence the outcome from the set of paired variables.

Ordinary least regression (OLS) model

The OLS regression analysis gives the technical relationship between the various inputs specified (independent variables) and the production output (dependent). The OLS regression was used to estimate the impact of Development Exchange Centre (DEC) micro-credit programme on respondents' crops output (Kg). The model was specified in implicit form as:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}, X_{12}, X_{13}) \text{----------(1)}$$

$$Y = \beta_o + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \beta_{13} X_{13} + E \text{---------(2)}$$

Where;

Y = Crops output (Kg); X_1 = Farm size (hectare); X_2 = Labour input (man day); X_3 = Age (years)
X_4 = Farming experience (years); X_5 = Cost of inputs (Naira); X_6 = Access to DEC micro-credit (amount received in naira); X_7 = Education (number of years of formal schooling); X_8 = Extension contact (number of contact in a year); X_9= Distance to market (Km); X_{10}= Remittance (Naira); X_{11}=Household size (number); X_{12}=Household expenditure (naira); X_{13} =Training (number of training) .$_E$ = error term;β_o = constant term ;β_1 -β_{13} = Regression coefficients to be estimated variables

More so, the implicit form of OLS regression model for the respondents' standard of living (Assets measure in Naira) as:
$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}, X_{12}, X_{13})$----------(3.)

The model is specified in explicit form as:
$Y = \beta_o + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \beta_{13} X_{13} + E$---------(4.)

Where;
Y = Assets (naira (₦)), X_1 = Farm size (hectare), X_2 = Labour input (man day), X_3 = Age (years)
X_4 = Farming experience (years) ,X_5 = Farm inputs (Naira) , X_6 = Access to DEC microcredit (amount received in Naira) ,X_7 = Education (number of years of formal schooling),X_8 = Extension contact (number of contacts in a year),X_9= Distance to market (Km), $_E$= error term , β_o = Constant term ,β_1- β_{13} = Regression coefficients to be estimated variables

Chow-test statistics

According to Dougherty (2007), chow test statistics is often used to determine whether a programme has effect on different population. The chow test statistics is an application of the F-distribution test and requires the sum of squared errors from three regressions, one from each sample group and one for the pooled data. If chow calculated is greater than the critical value, then there is effect, but if otherwise, there is no effect. This was used to test hypothesis i the model is specified as follows:

$$F - Chow = \left[\frac{RSS_0 - (RSS_1 + RSS_2)/K}{RSS_1 + \frac{RSS_2}{n_1} + n_2 - 2K} \right]$$ ----------(5)

Where

1. RSS_0 = Sum of squared residual from the pooled data.
   RSS_1 = Sum of squares from the first group (i.e. participants)
   RSS_2 = Sum of squares from the second group (i.e. non participants)
   $n_1$and n_2 = are the number of observations in each group
   K = Total number of parameters.

The Z – test

The Z-test statistic was used to test hypotheses ii that is DEC microcredit programme has no significant impact of on the standard of living of participants. The formula for calculating Z-test is:

$$Z = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$ ----------(6)

Where:

Z = Z statistic calculated value , $\bar{X}_1$ = Mean crop output and standard of living of the participants

$\bar{X}_2$ = Mean crop output and standard of living of the non-participants , S_1^2 = Standard deviation of participants ,, S_2^2 = Standard deviation of non-participants, n_1 = Sample size of participants,n_2 = Sample size of on-participants.

RESULTS AND DISCUSION

Socioeconomic characteristics of respondents

Table1 shows that45% of respondents were between the age of 31 to 40 years for participants and about 50.4% for non-participants. Mean age of participants was 37years while non-participants were 38 years. This implies that the respondents were young, active and productive in agricultural and income-generating activities. Tologbonse (2013) has reported that 52% of women in agriculture (WIA) have a mean age between 31 and 40 years and are therefore, agile and physically disposed to pursue agricultural production and income-generating activities. Also, age was found to be positively correlated to adoption of innovations, as younger women were more willing to accept new ideas that help to enhance their socioeconomic activities. About 72% and 69% of participants and non-participants respectively, had one form of education or another. This implies that a good percentage of the respondents could read and write. This finding corroborates that of Rahman, (2008), who state that, education

empowers women by helping to increase their ability to earn more income, adoption of agricultural technologies and also increase their status and providing them the basic knowledge to participate more in decision making within the family and community. 60% of participants and 47 % non- participants had a mean of 6 persons per household. This implies that most of them had relatively small household size. The size of a household is an important factor in agricultural production and other economic activities because it influences, to a large extent the supply of labour for immediate farm work (Jiriko, 2012). 71% of participants and 62 % non- participants cultivated land areas of between 2 to 4 hectares while approximately 22% of non-participants cultivated less than 2 hectares. The mean farm size for participants and non-participants was 2 hectares. This shows that the respondents are largely small-scale farmers. Going by Olayide's *et al.* (1980) classification of farm size of 0.1 hectare to 5.9 hectares as small farms), all the respondents were small scale-farmers. Olayide's *et al* (1980) also suggested that small farm size affects human capital, labour requirement and land tenure arrangement, as it would not allow for meaningful investment and returns on agricultural production.

Majority of the participants (52%) and only 47% of non-participants had farming experience of between 11 to 20 years. Although work experience of about 20 years and below may be considered low, the result could be due to the relatively youthful status of the respondents. This is in accordance with Igbago (2018) that work experience is not only defined by the length of time but also by the intensity and consistency of the work done within the given period. About 47% of participants and 53% of non-participants belong to women group association and cooperative society. This study is in tandem with the findings of Gashaw *et al.,* (2013), states that membership of association/cooperatives enabled both groups of respondents to interact with one another, as well as to share farming experiences; they also have a common avenue through which information on new technologies is disseminated. Membership of cooperatives enhances members' access to credit facilities, productive inputs and extension services, compared to those who are not members. Majority 73% and 82% of programme participants and non-participants had monthly contact with extension workers during the 2015 cropping season in the study area. The relationship between agricultural extension agents and the farmer is an important determinant in the adoption and sustenance of improved farm practices. This finding is in line with the finding of Odoemenem (2016) who reported that adoption level increases with increase in the intensity of extension services offered to farmers. The constant meeting/frequency of extension contact between the extension personnel and the women farmers would enlighten the latter and create better awareness for the potential gains from improved agricultural innovations.

The result in Table 1 shows that, 71% of programme participants received between ₦40, 001 – ₦50 with a mean amount of ₦45, 580.95. This implies that amount received by respondents is insufficient for a meaningful economic business. Credit is an important factor in agricultural production especially purchasing of farm inputs and labour. Microcredit programmes, when properly implemented, help place vital resources in the hands of rural women (Iheduru, 2015). Yawe (2012) reported that many programme beneficiaries, however, indicate that the loans received are often too small for meaningful agricultural activities

Table 1: Distribution of respondents according to socioeconomic characteristics

Variables	Participants	Mean	Non-Participants	Mean
Age(years)				
20-30	39(18.7)	**37**	45(21.4)	**38**
31-40	94(44.9)		106(50.4)	
>50	77(36.7)		5928.3)	
Education level (years)				
Primary education	51(24.3)		32(15.2)	
Secondary educ.	92(43.8)		100(47.2)	
Tertiary education	08(3.8)		13(6.2)	
Koranic education	59(28.0)		65(30.9)	
Household size (no.)				
1-3	62(29.5)	**6**	99(47.1)	**6**
4-6	126(60.0)		99(47.1)	
>7	22(10.4)		12(5.7)	
Farm size(ha)				
< 2	25(11.9)	**2.0**	46(21.9)	**2.0**
2.0- 4.0	149(70.9)		130(61.9)	
>4	36(17.2)		34(19)	
Farming Exp (years)				
1-10	09(4.3)	**22**	13(6.2)	**19**
11-20	109(51.9)		140(66.7)	
21-30	79(37.6)		52(24.8)	
>40	13(6.2)		5(2.4)	
Membership Association				
Women group	100(47.6)		55(26.2)	
Youth group only	06(2.9)		13(6.2)	
Mixed group	38(18.1)		31(14.8)	
Cooperative society	66(31.4)		111(52.9)	
Extension Visits (no.)				
None	2(1.0)		12(5.7)	
Weekly	45(21.4)		22(10.5)	
Monthly	153(72.9)		173(82.4)	
Annually	10(4.8)		3(1.4)	
Credit received (₦)				
20,001-40,000	53(25.2)	₦45,580.95		
40,001-50,000	150(71.4)			
>50,000	7(3.4)			
Training (no,)				
1-4	201(95.71)		186(88.6)	
5 above	09(4.29)		24(11.4)	

Figures in parentheses are percentages Source: Field Survey, 2015.

Determinants of crop outputs among programme participants and non-participants

The determinant of crop outputs among programme participants and non-participants was estimated by using the best fit regression model in Table 2. The result of the semi-log functional form, which was found to be the lead equation in this study, shows the adjusted R square of 0.66. This implies that 66% of the variability of crop outputs among programme participants was explained by the explanatory variables (age, farm size, labour, farm input, credit, education and extension contact). The coefficients of age, farm size, labour, credit, farm inputs, education and extension contacts obtained were positive. This indicate that the variable has direct relationship with the crops output of the respondents. The coefficient of age was found to be negative and significantly related with crop outputs at P<0.10) level of probability. The estimated coefficient of -787 implies that the crop outputs of programme participants will decrease by a magnitude of -787 as age increases by a unit. This could be because as programme participants increase in age, strength, agility and vigour decreases. The coefficient of farm size was found to be positive and significantly related with the crop output of programme participants. Foluronso, (2016), stated that, the coefficient (0.31010) for farm size is statically significant at 1% level of probability which shows that land as an input has major influence on output. Since the farming activity is traditional, availability of land determines the crop output that can be obtained from the farm. The estimated coefficient of 0.970 implies that the crop outputs of programme participants will increase by a magnitude of 0.970 percent as farm size increases by one unit. This is obvious because *ceteris paribus*, the expectation is that an increase in farm size should result in a concomitant increase in output. This result is line with the findings of Agwu et al, (2014), stated that, the coefficient of crops output was significant at one percent probability level with

a positive sign. This implies that, the larger the crops output from their farms, the greater the probability women in the study area move out of poverty, increase in their food crop marketing and improved their standard of living The regression coefficient of labour was found to be negative and significantly related with crop outputs at 10% level of probability. The estimated coefficient of -485 implies that the crop outputs of programme participants will decrease by a magnitude of -485 as labour increases. This may be due to the shift in interest from farm drudgery to white collar jobs usually associated with people with higher educational qualification. The coefficient of farming experience was found to be positive and not significant. The coefficient of farm inputs (0.527) and credit (0.821) had the expected positive relationship with the crop output of programme participants and was significant at P<0.05) and P<0.01) level of probability. The estimated coefficient of farm inputs and credits implies that the crop output of a programme participant will increase by a magnitude of 0.527 and 0.821 respectively as his crop outputs increases by one unit. This is considered a strong relationship. Ojiako and Ogbukwa, (2012) state that, agricultural or farm credit was a crucial input required by the smallholder farmers(women) to establish and expand their farms with the aim of increasing agricultural production, enhancing food sufficiency, promoting household and national income, and augmenting the individual borrower's ability to repay. Generally, the use credit facility to support farmers has been advocated because credit plays an enviable role in agricultural production, economic transformation and rural development (Ojiako *et. al*, 2015; Ojiako and Ogbukwa, 2012). This finding is corroborated by Ojiako et al. (2017) whose investigation of the determinants of productivity of smallholder farmers supplying cassava to starch processors in Nigeria, found that there was significant positive influence on the use of improved cassava varieties to boost yield outcome.

The coefficient of distance to market was found to be positive and not significant. The coefficient of education was found to have a direct relationship with the crop outputs of programme participants in the study area and is statistically significant at P<0.01) level of probability. The estimated coefficient of 0.063 implies that the crop output of a programme participant will increase by a magnitude of 0.063 as the number of years spent in school increases by one unit. Extension contact was positive and significant at P<0.01) level of probability. It was not surprising that extension contact was a good predictor of crop outputs, given the important role being played by contact farmers in the study area. Ogunbameru *et al*. (2006) identified extension contact, access to market, level of education, access to credit, access to land and taking part in decision making as the, determinants of crop output among women farmers of urban agriculture in Borno State, North-east, Nigeria.

Table 2: Regression estimates of crop outputs and socio-economic factors of programme participants and non-participants

	Participants			Non –participants		
Variables	**Coefficient**	**S E**	**t-value**	**Coefficient**	**S E**	**t-value**
(Constant)	-10.054**	4.181	-2.404	-1.548*	0.925	-1.673
Farm size	0.970***	0.186	5.21	0.332***	0.028	11.857
Labour	-0.485*	0.280	-1.734	0.261***	0.100	2.61
Age	-0.787*	0.455	-1.729	-0.139	0.093	1.494
Farm experience	0.239	0.256	0.933	0.023	0.040	0.575
Farm input	0.527**	0.268	1.965	-0.037	0.059	-0.633
Credit	0.821***	0.295	2.783	0.001	0.067	0.014
Access to market	0.001	0.116	0.008	-0.003	0.035	-0.085
Education	0.063**	0.028	2.25	-0.021	.018	-1.166
Extension Contact	0.0542**	0.221	2.45	-0.012	0.062	-0.193

Source: Field Survey, 2015. *** P< 0.01, ** P<0.05 and * P<0.10.

Test of Hypothesis of Impact on DEC Microcredit Programme on Participants' Crop Output

The result shown in Table 3, indicated that, the F-chow calculated value is 15.6583 while F-tabulated value is 1.93 at 5 percent level of probability for eight degree of freedom and the population (N) was 420. The analysis shows that F^{*}-chow calculated is greater than F-tabulated. This implies that DEC microcredit had impact on crop outputs of programme participants. This study is in agreement with the findings of Simonyan (2010) on the impact analysis of Fadama II project on income and productivity of beneficiaries in Kaduna State.

Table 3: Chow test analysis of impact of DEC microcredit programme on the participants' crops output

Group sample	R^2	RSS	N	K	F-cal	F-tab
Pooled	0.542	295.399	420	9	15.6583	1.93
Participants	0.460	299.449	210			
Non-participants	0.474	6.463	210			

R^2 = regression coefficient, N = numbers of observation and K = numbers of parameters

Determinants of standard of Living among Programme Participants and Non-participants

The result of the analysis of determinants of standard of living among programme participants is presented in Table 4. The adjusted R square of 0.561 implies that 56% of the variability of the standard of living among the programme participants influence by the explanatory variables (age, farm size, labour, credit, distance to market, education and extension contact) specified in the model. The factors that had significant influence on standard of living of programme participants in the study area were age, farm size, labour, credit, access to market, education and extension contact. The coefficient of age was found to be positive and significantly related with standard of living at 1% level of probability. The estimated coefficient of 0.403 implies that the standard of living of a programme participant will increase by a magnitude of 0.403 as age increases by a unit. This finding corroborate that of Amine (2016), Asserted that, younger households particularly in their middle age tend to engage in different productive activities (crop production, rearing of livestock and petty business) to increase their income and saving and gradually accumulate wealth to ensure higher future consumption and improved standard of living. The coefficient of farm size was found to be positive and significantly related with the standard of living of the programme participants. The estimated coefficient of 47.510 implies that the farm size of programme participants will increase by a magnitude of 47.5% as farm size increases by one unit. This is obvious because *ceteris paribus*, the expectation is that an increase in farm size should result in a concomitant increase in farm income and subsequently standard of living. The regression coefficient of labour was found to be negative and significantly related with standard of living. This implies a unit increase in farm labour by participants will bring a decrease to the participants' standard of living. Credit assists women farmers in the purchase of farm inputs such as fertilizer, herbicides, improved seeds and investment demand which will ultimately increase their productivity and standard of living. credit access has a positive coefficient (0.603) and is significant at 1% level of probability. Therefore, unit increases in credit received by the programme participants will increase the respondents' standard of living by 0.603. The coefficient of farm experience was found to be positive but not significantly related to participants' standard of living. The coefficient of farm inputs and farming experience was negative and had no significant relationship with standard of living of the programme participants. The coefficient of access to market was found to be positive and significantly related to standard of living. This finding disagrees with the findings of Nwalieji *et al* (2015) stated that there was significant change ($\chi 2= 40.14$, $P\leq .05$) in the proportion of PPFs before and after the commencement of the project. This implies that there are significant changes in ease of marketing rice produce by the PPFs. Credit assists the farm households in the purchase of farm inputs such as fertilizers, herbicides, improved seeds and investment demand, which ultimately increase their productivity. However, credit had positive coefficient (0.295) and was not significant, perhaps due to the small amount of credit received by programme participants. These findings corroborate Nwalieji *et al* (2015) stated that there was no significant change ($\chi 2= 6.00$, $P > .05$) in the proportion of PPFs that had access to credit, before and after the commencement of the project. This implies that there is no significant increase in access to credit by the farmers. Degree of accessibility to credit implies farmers' ability to acquire or access loan facility or other credit facilities from the agency. However, access to credit is seen as a great enabler for primary producers' especially small-scale farmers in enhancing adoption of technologies and better production methods to improve farm output, income and standard of living.

Education holds the key to development. This may be the reason why Okwu *et al.* (2008) recommended that education, whether formal or informal, should be provided to women farmers at all levels. Thus education coefficient was found to have a direct relationship with standard of living of programme participants in the study area and is statistically significant at 5% level of probability. The estimated coefficient of 0.7574 implies that the standard of living of the programme participants will increase by a magnitude of 0.7574 as the number of years spent in school increases by one unit. Extension contact was significant at 1% level of probability. The estimated coefficient of 0.00262 implies that the standard of living of the programme participants will increase by a magnitude of 0.00262 as extension contact increases by one unit.

Table 4. Regression estimates on factors determining, standard of living among programme participants and non-participants.

	Participants			Non- participants		
Variables	**Coefficients**	**SE**	**t-stat**	**Coefficients**	**SE**	**t-stat**
(Constant)	11.057	5.065	2.183**	404.644	74.574	5.426***
Farm size	47.510	12.738	3.729***	3.729	6.592	0.565
Labour	-0.260	0.145	-1.793*	22.516	2.577	8.737***
Age	0.403	0.075	5.373***	14.558	5.895	2.469***
Farm Experience	-0.071	0.129	-0.550	-0.2704	0.2151	-1.257
Farm Input	-0.129	0.138	-0.934	0.410	0.545	0.752
Credit	0.603	0.163	3.699***	-1.928	3.921	-0.492
Access to market	0.128	0.059	2.169**	-2.086	2.072	-1.006
Education	0.7574	.03360	2.254**	2.831	1.039	2.724***
Extension Contact	0.00262	0.00025	10.48***	2.232	3.657	-610

Source: Field Survey, 2015 *** P< 0.01, ** P<0.05 and * P<0.10.

Test of Significant of Impact of DEC Microcredit on Standard of Living of Programme Participants

The hypothesis was tested by using Z-test the result presented in Table 5. shows that Z- calculated was greater than Z -tabulated and was significant at 1% level of probability. This implies that the DEC microcredit programme had impacted on standard of living of the participants. This findings is in line with that of Jiriko (2012), stated that project agape had a positive impact on participants trading, income and living standard.

Table 5: Distribution of Z - test result of DEC microcredit impact on participants' Standard of living

Variable	Participants	Non-participants
Mean	₦701,379.6952	₦224,131.02
Known variance	68007284936	13707475041
Observations	210	210
Z - Stat	24.19***	
P(Z<=z) one-tail	0.0000	
Z - critical one-tail	1.649	
P(Z<=z) two-tail	0.0000	
Z - critical two-tail	1.96	

Source: Field Survey, 2015. *** Significant at 1%

Constraints Encountered by Participants in Accessing Microcredit from DEC

The results in Table 6 show three major constraints were perceived to be a serious constraint in accessing credit. These were low volume of loan disbursed (X = 2.36) followed by short repayment period (X = 2.23) and high interest rate charged (X = 2.15). This is in line with the finding of Olujide (2014), who identified limited funds, short period of repayment and high rate of loan default as the major constraints facing COWAN in Ondo State, Nigeria.

Table 6: Mean distribution of respondents according to perceived constraints encounter in accessing credit from DEC.

S/N	Constraints	Mean score	Percent	Ranking	Decision
1	Low volume of loan disbursed	2.36	79	1st	S
2	Short duration of loan	2.23	74	2nd	S
3	High interest rate on loan	2.15	72	3rd	S
4	Inadequate finance	1.98	66	4th	Ns
5	Lack of government support	1.80	60	5th	Ns
6	Transport problem	1.86	62	6th	Ns
7	Non-involvement in project supervision	1.80	60	7th	Ns
8	Non-involvement in decision making	1.60	53	8th	Ns
9	Communication gap	1.45	48	9th	Ns
10	Religious discrimination	1.32	44	10th	Ns

Source: Field survey, 2015 S= Serious constraints. Ns = Not serious constraints.

CONCLUSION AND RECOMMENDATION

The result shows that the mean age of participants and non-participants was 37 and 38 years, mean farming experience was 22 and 20 years; mean household size of 6 persons and a mean farm size of 2.0ha respectively. The findings on membership of cooperatives association, showed that 48% and of 53% of the programme participants and non-participants respectively belonged to women groups and cooperatives associations. Furthermore, 73% and 82% of the programme participants and non-participants had monthly contact with extension workers, the study concludes that 71% of programme participants received a mean of ₦45, 580.95 as credit.

Based on the findings, this study concludes, that age, education, farm size, labour, access to market, education and extension contact had significant and direct relationship with living standard of the participants. The Z – statistics shows that, Z-cal was greater than Z-tab, implies DEC microcredit programme had positive impact on living standard of the participants. Furthermore, the F-chow calculated shows that DEC microcredit had impact on the crops output of programme participants. The major constraints encountered in accessing DEC microcredit by programme participants was low volume of loan disbursed, short repayment period and high interest rates charged. It was recommended that, DEC microcredit organization should increase the amount of loan disbursement from current ₦20,000 - ₦100, 000, so as to increase participation or patronage; extend the repayment period (but without jeopardizing the interest of the organization), interest rates should be lowered to allow for greater participation and DEC microcredit should be extended to others Local Government Areas of Kaduna State.

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