

## Adoption of African Development Bank (AfdB) Community-Based Agriculture and Rural Development Crop Production Project among Beneficiaries in Kaduna and Bauchi States, Nigeria

<sup>\*1</sup>Chikezie, N.P., <sup>2</sup>Omokore, D.F. and <sup>2</sup>Akpoko, J.G.

<sup>1</sup>Department of Agricultural Extension and Rural Sociology, Faculty of Agriculture, University of Abuja.

<sup>2</sup>Department of Agricultural Extension and Rural Development, Institute of Agricultural Research, Ahmadu Bello University, Zaria, Nigeria .

**\*Corresponding Author:** Chikezie, N.P. Department of Agricultural Extension and Rural Sociology, University of Abuja, Nigeria. Email: akjamin2010@gmail.com

### ABSTRACT

This study was conducted to assess the level of adoption of AfDB- Community Based Agriculture and Rural Development crop production project among beneficiaries in Kaduna and Bauchi States, Nigeria. The specific objectives were to describe the socio-economic characteristics of respondents; ascertain level of adoption of ADB-CARDP on crop varieties in the two States; determine impact of adoption of the project on crop production, income and living standard of respondents. Primary data for the study were collected using well-structured questionnaire, administered to 746 beneficiaries and 746 non-beneficiaries. Descriptive and Chow test – statistics were used to analyze the data. Results showed that the beneficiary mean age was 51.9, household size of 11.8, farm size of 1.32. The level of adoption of recommended crop varieties was high. About 75.1% of the beneficiaries adopted cowpea variety IT 93K-45 and 92.4% adopted Sorghum ICSV 400. All the adoption level impacts were highly significant at 1% level of probability. The results of Chow test - statistic showed that crop output, crop yield, income and level of living were all significant at 1% level of probability. The following recommendations were made: promotion of savings among farmers and farmer groups should be encouraged as well as promoting the activities of extension staff for improved coverage and outreach.

**Keywords:** Community-based, agriculture, rural development, project, beneficiary

### INTRODUCTION

Agriculture plays a key role in the economic development of Nigeria in terms of producing food, foreign earnings from export, raw materials and employment. (Dauda, 2004). Nigeria's agriculture at independence was characterized by high production achieved by mobilizing small scale farmers, provision of infrastructures geared towards developing crops required for export. Food was abundant and the demand for food was met without resorting to importation, thereby laying the foundation for research (Simonyan, 2010). However, with increase in the Nigerian population, the oil boom in 1970s and apparent neglect of the agricultural development, food insecurity and poverty became the resultant effect. Many development experts have recently recognized that unlike in developed countries where

economic development efforts were achieved via industrial revolution, the developing countries can achieve improved standards of living for their citizens faster only if their agriculture is modernized and their rural economies restructured (Simonyan, 2010).

However, it is believed that this development in the developing countries requires the infusions of technology and capital into the agricultural sector with institutional reforms and the integration of crop production with overall rural development (Amogu, 2004). These views have grown out of an understanding that farm sizes are small and resources of the developing countries are mainly exploited by farming techniques that result in low productivity, low yield per hectare and low income per worker which in turn has greatly accounted for most of the rural dwellers poverty State (Simonyan,

2010). It is a known fact that majority of the world's population live in rural areas where they are engaged in agriculture (Taimi, 2003). However, developing countries and their rural areas in particular, are characterized by poverty, unemployment, unequal distribution of physical and institutional infrastructure, increasing rural-urban drift and the general marginalization of the rural resources (Williams, 1978). According to Ekong (2003) rural transformation denotes a rapid improvement in the life of rural man and his physical environment. In the same vein, Smith (1977) is of the view that rural development is almost synonymous with agricultural development and this conception has been broadened recently to encompass the equitable and balanced transformation of complex social- economic ,institutional, political and other relationships and process of rural development including but not limited to agriculture, education, employment, health care, nutrition, voice in decision making and actions that affect the live of rural dwellers. Ijere (1988) contended that, for rural development programme to succeed, one of its major concerns should be to reflect the realities, needs and aspirations of the rural people. In a similar vein, (Olukosi, 2002) is of the opinion that for any development project to succeed, there is need to not only involve the community on development project in a bottom- up manner but, empowering them to initiate projects based on their felt needs and priorities, plan by themselves, implemented by themselves with outsiders as facilitators. The Nigeria governments have initiated several developmental programs to reduce poverty level of the people yet little success was recorded in terms of farmer's productivity and rural livelihoods. Funding was and remains a major problem both for the government and rural inhabitants. Government budget for agriculture has been decreasing (Amogu, 2004). According to National bureau of statistics about 112.5million Nigerians live below poverty line (NBS, 2012). Poverty rates remain high in Nigeria, particularly in rural areas. These rates declined between 2003-2004 and 2009-2010, although not nearly as fast as would be expected from the pace of economic growth in the country. While the officially reported growth rates of Gross Domestic Product (GDP) well exceed population growth in the country, the pace of poverty reduction does not; this implies that the number of poor Nigerians living below the poverty line has grown measurably (NBS,

2012). A look at the overall trend in poverty rates over the years in the country revealed that in 1980, the figure was 28.1million. It increased to 46.3million in 1985 and slides a little to 42.7million in 1992. It rose very high at 65.6 million and 70 million in 1999 while the 2004 figure was 54.4million, it increased to 99.28 million in 2010 and 112.5million in 2012 (NBS, 2013). According to Central Bank of Nigeria (CBN, 1999) Nigeria ranked number 26th among the poorest countries in the world and the proportion of Nigerians living below the poverty line of one dollar a day has increased dramatically during the last two decade. Poverty is more widespread in the Northern part of the country (IFAD, 2010). Almost 90% of Nigerian poor are engaged in agriculture yet; the total food demand had never been met as the ability of Nigerian farmers to produce enough food for the growing population depends on their level of technical efficiency (IFAD, 2010).

Yahaya (2002) opined that rural development strategy brings about total transformation in the quality of life of the people who are supplied with development projects. This improvement in the human life takes the form of enhanced environment, healthy living, asset possession, and access to knowledge and availability of sufficient resources for decent standards of living, conclusive democratic atmosphere necessary for peaceful co-existence and national stability. However, past poverty reduction programmes had a marginal impact on poverty and rural livelihood despite large budgetary allocations and these programmes failed to achieve their objectives because of poor design (Tomori et al. 2005). In view of this past failures of all these development programmes geared toward improving rural livelihoods, the government came up with a new poverty reduction plan in 2003. The Community based Agriculture and Rural Development Project is an integrated agricultural and rural development project aimed at improving the livelihood and living conditions of the rural poor with much emphasis on men, women and other vulnerable groups.

#### **The Objectives of AfDB Cbardp Includet to**

- empower poor rural women and men to critically analyze their constraint, opportunities and support requirements
- To increasingly effectively manage their own development.

## Adoption of African Development Bank (Afd) Community- Based Agriculture and Rural Development Crop Production Project among Beneficiaries in Kaduna and Bauchi States, Nigeria

- support institutionalization of the policies and process, create awareness and develop the capacity of public and private sector service providers to become more relevant and responsive to the rural poor women and men, and
- support balanced sustainable social, agricultural and economic development interventions for the appropriate village women's and men's groups and individuals.

The project is jointly funded by African Development Fund, Federal Government of Nigeria, and five participating States namely, Kaduna, Bauchi, Adamawa, Gombe and Kwara States. In Kaduna State, the participating local government areas include Birnin Gwari, Kaduna South, Igabi, Ikara, Sabon Gari, Zaria, Kachia, Jaba and Sanga with 27 selected rural village areas (RVAs). While in Bauchi State the participating local government areas include Katagum, Damban, Tafawa Balewa, Bogoro, Toro, Ganjuwa, Ningi, Giade and Zaki with 27 selected RVAs.

### PROBLEM STATEMENT

Income and productivity in Nigerian rural areas are low hence rural population remains poor. There is also large inequality within the rural social system, with the top 10% of the income bracket accounting for close to 60% of total consumption of goods and services (Adeolu and Taiwo, 2004). Agricultural production techniques have remained rudimentary despite many years of work on technology generation and transfer by the state and federal governments. The use of inputs such as fertilizer, improved seed and mechanization is low while irrigation efficiency is also low at about 20% (Simonyan, 2010). The probable reasons for the poor performance may be attributed to inadequate infrastructures such as roads, storage, packaging, processing and credit facilities. Rural financial services are scarce and the rural finance policies implemented by Nigeria some decades ago have harmed rather than helped the beneficiaries (Simonyan, 2010).

However, the concern over increasing socio-economic predicament of the rural poor in developing Countries like Nigeria and the need for its improvement as a need for empowering its Citizens has led to the conceptualization of various targeted poverty alleviation programmes worldwide (Babatunde, 2006). An example of such programme is the African Development

Fund- Community Based Agriculture and Rural Development Project (ADB-CBARDP) which is an integrated and rural development Project designed to improve the livelihoods and living conditions of the rural poor with emphasis on women and other vulnerable groups. The Project goal is reduction of poverty through improving the livelihoods and living conditions of the rural poor by empowering and supporting them to effectively manage their own development activities. The Project objective is to contribute to the Country's food security efforts, increase access to rural infrastructure facilities in the Project areas using participatory community demand driven approach. The Projects component include Capacity building, Productions development, Community development and Management and Coordination (PIUs, 2006).

The African Development Bank loan was declared effective in December, 2003 and the first disbursement was done June, 2006. The AfDB-CBARDP has the long held belief by development experts that the problem of Nigerian agriculture is low technical capacity or poor technical efficiency. In view of this, the AfDB-CBARDP set out to address this by making technologies available to farmers in a section of Nigeria where such technical capacity was considered low. AfDB-CBARDP also assumed that once technologies were adopted and agricultural inputs provided, crop production will increase and farmers will become food secure, rural income will rise, drift from rural to urban areas will reduce, wage earning activities will increase, there will be improvements in infrastructure facilities, capacity building will be enhanced and rural livelihood will improve (PIUs, 2006). Consequently, the following Project activities were implemented: tractor hiring services, credit scheme, subsidized inputs supply, feeder road construction, provision of recreational facilities, extension service, improved crop varieties and other institutional support services (PIUs, 2006). However, since the inception of the project in 2006 till date, independent assessment of the impact of the project on beneficiaries has been scanty. This study therefore, is taking the challenge of filling this research gap of assessing the impact of the Project on crop output, crop yield, income, and level of living, to empirically determine its achievements vis-a-vis the goal and objectives of the Project. The

## Adoption of African Development Bank (Afd) Community- Based Agriculture and Rural Development Crop Production Project among Beneficiaries in Kaduna and Bauchi States, Nigeria

study therefore intends to provide answers to the following questions

- What are the socio-economic characteristics of beneficiaries of ADB-CBARD Project in the study areas?
- What is the level of adoption of improved crop varieties by beneficiaries of ADB-CBARD Project in the study areas?
- What is the impact of the Project on farm crop output, yield, income and level of living in the study areas?

### OBJECTIVES OF THE STUDY

The broad objective of this study was to analyze the level of adoption of Africa Development Fund- Community Based Agriculture and Rural Development crop production project in Kaduna and Bauchi States, Nigeria. The specific objectives were to

- describe the socio-economic characteristics of beneficiaries of ADB-CBARD Project in the study areas;
- assess the level of adoption of improved crop varieties by beneficiaries of ADB-CBARD Project in the study areas;
- examine impact of level of adoption on crops' varieties; and
- determine the impact of the project on crop output, yield, income and level of living of beneficiaries of ADB-CBARD Project in the study area

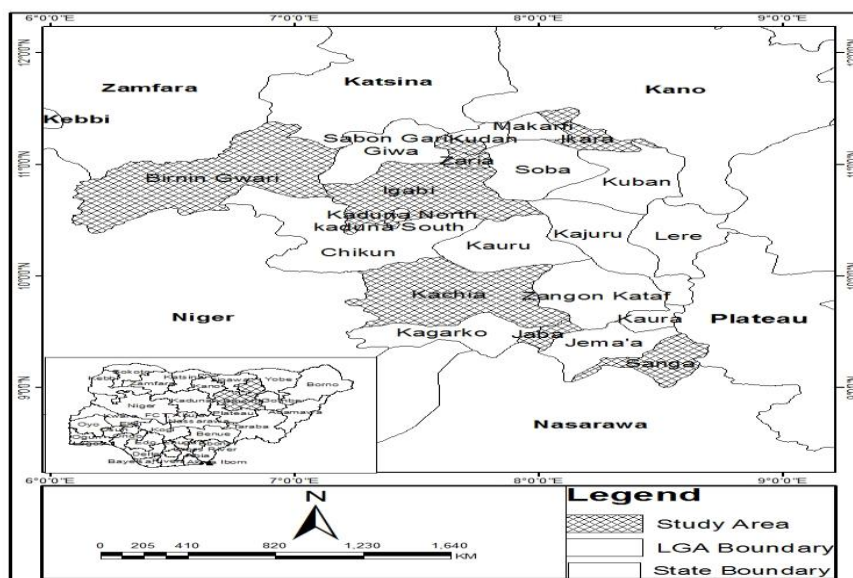
### Hypotheses

The project has no significant impact on beneficiaries output, yield, income and level of living as well as level of adoption of improved crop varieties in the study area.

### Methodology

The study was conducted in two States namely Kaduna and Bauchi States. Kaduna State is located between latitude 10 and 12° N and extends from longitude 6° and 9° E and East of Greenwich Meridian. The State has a population of 6,066,512 people according to 2006 population census and a projected population of about 6,667,357 in 2010 and it is the third largest in the federation after Lagos and Kano (FOS, 2006). It has an estimated cultivable land area of about 45,786 km<sup>2</sup> with only about 30,000 km<sup>2</sup> under cultivation by traditional low-income group. The mean annual rainfall shows a marked decrease from South to North (1524-633 mm). The vegetation in the southern part of the State is southern guinea savannah vegetation while vegetation in the north is northern guinea savannah. Farming is the main occupation of the people of Kaduna and it is characterized predominantly by mixed cropping, of such crops as maize, sorghum, millet, cowpea, rice, cassava, sugarcane and tomatoes (Chikwendu, 2005).

Rain-fed agriculture is mostly practiced in the State with little fadama farming. The State is currently made up of twenty-three Local Government Areas (LGAs) out of which nine (9) local government areas are participating in the community based agriculture and rural development project. The participated LGAs are Zaria, Igabi, Jaba, Sabon Gari, Ikara, Birnin Gwari, Kaduna South, Kachia and Sanga.

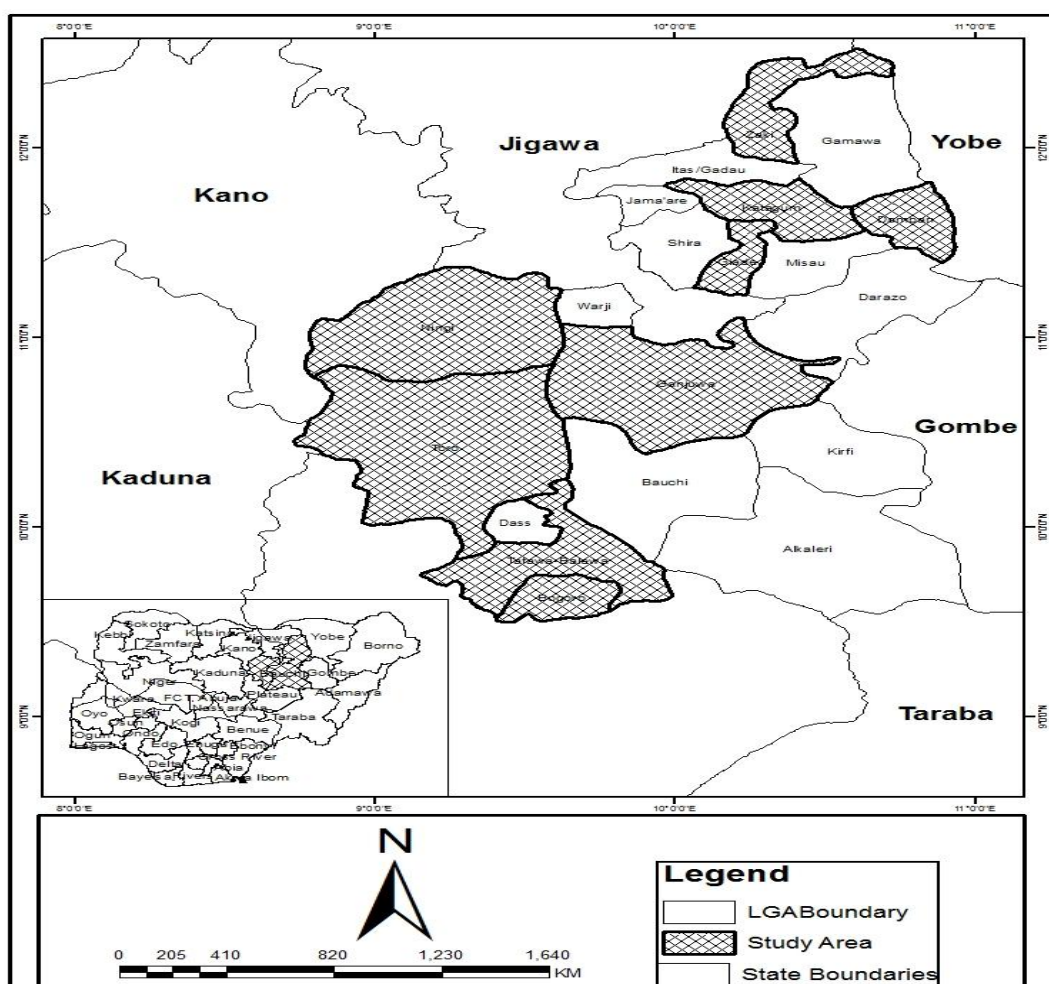


## Adoption of African Development Bank (Afdb) Community- Based Agriculture and Rural Development Crop Production Project among Beneficiaries in Kaduna and Bauchi States, Nigeria

**Fig.1** Map of Kaduna State showing the Study Areas

Bauchi State occupies a total land area of 49,119km<sup>2</sup> representing about 5.3% of Nigeria's total land mass and is located between latitudes 9°3' and 12°3' north and longitudes 8°50' and 11° east (NBS, 2013). The rainfall in Bauchi State ranges between 1300mm per annum in the south and only 700mm per annum in the extreme north. Rains start earlier in the southern part of the State, where rain is heaviest and lasts longer. Here the rains start in April, while the northern part of the State receives the late,

usually around June or July. The State has a population of 4,653,066 people according to 2006 population census and a projected population of about 5,467,353 people at 2.5% growth rate in 2014. The State is currently made up of twenty local government areas out of which nine local government areas and twenty seven rural village areas are participating in the CBARD project. The participating LGAs are katagum, Bambam, T/Balewa, Bogoro, Toro, Ganjuwa, Ningi, Giade and Zaki (NBS, 2013).



**Fig.2** Map of Bauchi State Showing the Study Areas

### Sampling Procedure and Sample Size

Data were collected in all the participating Local Government Areas in Kaduna and Bauchi states. The benefitting local governments in Kaduna are Birnin Gwari, Igabi, Ikara, Jabba, Kachia, Kaduna south, Sabon Gari, Sanga and Zaria while the benefitting Local Government Areas in Bauchi are Katagum, Bambam, Tafawa Balewa, Bogoro, Toro, Ganjuwa, Ningi, Giade

and Zaki. The populations of beneficiaries were collected from Kaduna and Bauchi ADPs. Each benefitting Local Government Area is made up of three Rural Village Areas (RVAs) which is headed by an Apex coordinator making a total of 27 RVAs for each state. About 5% of the beneficiaries from each Local Government Areas were selected using simple random sampling technique. In order to effectively study the impact of CBARD project on beneficiaries,

## Adoption of African Development Bank (Afd) Community- Based Agriculture and Rural Development Crop Production Project among Beneficiaries in Kaduna and Bauchi States, Nigeria

equal sample populations of non-beneficiaries were also purposively selected from the same RVAs and were used as a control group. Each of the two groups (beneficiaries and non-

beneficiaries) were 746 making a total of 1,492 respondents from the two states (Table 1).

**Table1.** Showing sample size and sampling procedure of respondents.

State	LGA	Beneficiaries		Non-beneficiaries	
		Sample frame	Sample size	Sample frame	Sample size
Kaduna	Birnin Gwari	450	23	450	23
	Igabi	1154	58	1154	58
	Ikara	864	43	864	43
	Jaba	1070	54	1070	54
	Kachia	1385	69	1385	69
	Kaduna South	604	30	604	30
	Sabon Gari	1139	57	1139	57
	Sanga	644	32	644	32
	Zaria	1013	51	1013	51
	Bauchi	Katagum	450	23	450
Bambam		600	30	600	30
T/Balwa		644	32	644	32
Bogoro		1000	50	1000	50
Toro		1002	50	1002	50
Ganjuwa		609	30	609	30
Ningi		804	40	804	40
Giade		705	35	705	35
Zaki		800	40	800	40
<b>Total</b>			<b>14936</b>	<b>746</b>	<b>14936</b>

### DATA COLLECTION

The data collection for this study was done through the use of detailed and well-structured questionnaire and interview schedule. Two sets of questionnaires were utilized in the course of this study namely one for the project (CBARDP) beneficiaries and the other for non-project beneficiaries. Some of the secondary information that were collected and used for this study included reports of Kaduna ADP, Bauchi ADP, literatures on Community Based Agricultural and Rural Development Project, journals and books.

### Analytical Techniques

Descriptive statistics such as means, tables, percentages, frequency distribution, and ranking were used to achieve objectives 1 and 2.

### Chow Test Statistic

According to Dougherty (2007) Chow test statistics is often used in program evaluation to determine whether the program has impacts on different subgroups population. The chow test statistics is an application of the F- distribution test; it 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 was project impact on beneficiaries otherwise no impact. This was used to test the project's impact on beneficiaries output, yield, income and level of living as well as level of adoption of improved crop varieties in the study area. This was used to achieve objectives 3, 4 and test the hypotheses of the study. The model is specified as follows;

$$F\text{-Chow} = \left( \frac{(R_{ss} - R_{ss1} + R_{ss2})/K}{R_{ss1} + R_{ss2} / N1 + N2 - 2K} \right)$$

Where

R<sub>ss</sub> = sum of squared residual from the pooled data.

R<sub>ss1</sub>=sum of squares from the first group (i.e. beneficiaries)

R<sub>ss2</sub>=sum of squares from the second group (i.e. non beneficiaries)

N1N2=are the number of observations in each group

K= total number of parameters

The variables were measured by either single or composite measure techniques. The single measure technique uses only one question or indicator to measure the domain of a concept.

The composite measure on the other hand combines several questions to build up a summary score, scale or index for the concept.

**RESULTS AND DISCUSSION**

**Socio-Economic Characteristics of Respondents**

The entries in Table 2 indicate that 80.3 % of the beneficiaries were male while 87.4 % of the non-beneficiaries were male. Also, female beneficiaries were 19.7 % and 12.6 % respectively were female non-beneficiaries. 95% of the beneficiaries were married while 96.9 % of non-beneficiaries were married as well. This implies that the male folks still play dominant roles in agriculture and related business in the study area. The gender distribution can be attributed to the current practice of purdah (women in seclusion) as the people in the area are predominantly muslims. Women in seclusion do not engage in direct agricultural production. A high percentage of the respondents were also married. This could be attributed to the culture of early marriage in the study area. These findings are typical of small scale farmers as reported by (Abdullahi, 2010) that large proportions of small scale farmers in Nigeria are male and married.

Ages of respondents examined and presented in Table 2 shows that beneficiaries within the age bracket of 21-30 yrs constituted about 4.9%, 31-40yrs were 9.6%, 41-50yrs were 38.9%, 51-60 yrs were 31.4% while 61-70yrs were 14.9 %. However, for non-beneficiaries those within 31-40yrs constituted 18.8 %, 41-50yrs were 31.1 %, 51-60yrs were 43.9 and 61-70yrs were 6.2%. The mean age of the beneficiaries was 51.98 while non-beneficiaries mean age was 49.16.

In the two groups, there were more respondents between the ages of 51-60yrs. This was due to the fact that there are more elderly people engaged in farming activities in most of the rural communities than the younger people. This finding agrees with Ogunbameru (2001) who discovered that Nigerians have ageing farming population. Also, Adeolu and Alimi (2004) noted that the average age of participants in Fadama II Project was 50 years. They noticed that the participants were ageing without adequate replacement. This is not good for agricultural transformation. For educational

qualification, Table 2 shows that 27.1% of the beneficiary’s had Islammiya education, 26.7 % had Primary education, 14.6 % had no formal education, and 19.6 % had Secondary school education while 12.1% had Tertiary education. Similarly, for non- beneficiaries 34.3 % had Islammiya education, 22.1 % had Tertiary education, 15.5 % had both Primary and Secondary education respectively while 12.5 % had no formal education. This means that most respondents had attained certain level of education. Education is important for easy understanding of improved methods of agricultural production and makes farmers more receptive to advice from extension agencies or be able to deal with technical recommendations that require a certain level of numeracy and literacy, (Abdullahi, 2010). This finding corroborates with UNDP (1997) that any level of education may be able to positively modify people’s behaviours. The mean household size of both beneficiaries and non- beneficiaries are 12 and 10 persons per household respectively. The result therefore corroborates Ejembi and Ejembi (2005) who discovered that most families use their family members as ‘equipments’ for working in their farms and or for further agricultural development and or expansion of farms. Each family therefore has sufficient number of people and consequently sufficient work force to enhance their agricultural production which in turn can guarantee steady income flow and consequently improved level of living.

One major characteristic of small scale farmers is small land holding. In order to be able to ascertain the size of land, farm and resources under the control of farmers, farm sizes were examined. The results in Table 5.5 show that the mean farm size of beneficiaries and non-beneficiaries were 1.32 ha and 1.0 ha respectively. Going by Olayide (1980), classification of farm size by 0.1 hectare to 5.9 hectares as small farms; it then implies that all the respondents were small scale farmers. The result suggests that farm size affects adoption costs, risk perception, human capital, labour requirement and tenure arrangement. This will also not allow for meaningful investment and returns to scale on adoption of recommended crop technologies

**Table2.** Socioeconomic Characteristics of Respondents

Attributes	Beneficiaries		Non-Beneficiaries	
	Frequency	Percentage	Frequency	Percentage

**Adoption of African Development Bank (Afd) Community- Based Agriculture and Rural Development Crop Production Project among Beneficiaries in Kaduna and Bauchi States, Nigeria**

<b>Sex</b>				
Male	599	80.3	652	87.4
Female	147	19.7	94	12.6
<b>Age</b>				
21-30	37	4.9	-	-
31-40	72	9.6	140	18.8
41-50	235	31.4	232	31.1
51-60	290	38.9	327	43.9
61- 70	112	14.9	47	6.2
<b>Marital status</b>				
Married	709	95.0	723	96.9
Single	37	5.0	23	3.1
<b>Household size</b>				
1-5	149	20.0	94	12.6
6-10	163	21.8	395	52.9
11-15	271	41	117	15.7
Above 15	163	21.8	395	52.9
<b>Education level</b>				
No formal education	109	14.6	93	12.5
Islammiya education	202	27.1	256	34.3
Primary	199	26.6	116	15.5
Secondary	146	19.6	116	15.5
Tertiary	90	12.1	165	22.1
<b>Farming Experience</b>				
<b>0 – 5</b>	55	8.2	47	6.3
6-10	36	4.8	46	6.2
11-20	180	19.3	93	12.5
21-30	128	17.2	209	28.1
Above 30	347	50.5	351	46.9
<b>Farm size</b>				
0.1-1	420	66.2	374	50.2
1.1 -2	200	26.8	349	46.8
2.1-3	72	9.6	23	3.1
Above 3	64	7.2	-	-
<b>Extension contact</b>				
No contact	nil	nil	324	43.4
1 - 5	181	24.3	24	3.2
6 - 10	92	12.2	164	22.0
Above 10	473	63.5	234	31.40

*Field survey data, 2017*

Farming experience is very vital in the profile of farmers as cognate experience in any field of endeavour can lead to expertise. The result in Table 2 also reveals that beneficiaries had more farming experience with a mean value of 31.46yrs while non-beneficiaries had 30.16yrs. According to Amaza et al. (2009), farming experience is an important factor determining both the productivity and the production level in farming. Generally, it would appear that up to a certain number of years, farming experience has a positive impact. Adebayo (2011) agrees with this when he stated that years of experience in farming has great influence on production, storage and marketing of farm output because it is an indication of the farmer's expertise in farming. The findings revealed that about 43.4

% of the non-beneficiaries had no contact with the general extension agents while beneficiaries were routinely visited by extension agents. Agricultural extension service constitutes a driving force for any agricultural development. The relationship between agricultural extension agents and the farmer is an important determinant in the adoption and sustenance of improved farm practices. The CBARD extension agents concentrated on the beneficiaries while the necessary agricultural information flows to the non-beneficiaries courtesy of fellow farmers.

**The Level of Adoption of Improved Crop Varieties of Beneficiaries and Non-Beneficiaries**



## Adoption of African Development Bank (Afd) Community- Based Agriculture and Rural Development Crop Production Project among Beneficiaries in Kaduna and Bauchi States, Nigeria

Table 3 shows a high adoption level for the ADB-CBARD Project beneficiaries and a low adoption level for non-beneficiaries. This result particularly shows that 75.1 % of the beneficiaries adopted IT 93K-45 and 87.5 % also adopted IT 90K 45-1. For non-beneficiaries, 16.1 % adopted IT 93K-45 while 6.4 % adopted IT 90K 45-1. 94.9 % beneficiaries adopted Ex Dakar while non-beneficiaries adopted 3.1 %. For Faro and Nerica rice varieties, 90.3 % and 65.8 % adopted for beneficiaries while 12.6 % and 12.6 % respectively adopted for non-beneficiaries. About 92.4 % adopted sorghum ICSV 400 while 16.0 % belonged to non-beneficiaries. For soya bean TGX 1448 -2E AND TGX 1740 -2E, beneficiaries adopted 87.7 % and 65.5 % respectively while non-beneficiaries also adopted 12.7 % and 15.7 % respectively. About 80.4 % of beneficiaries also adopted millet SOSAT C88 while non-beneficiaries adopted 25.3 %. For early maize varieties such as TZ 95 EEW, TZ 95 EEY and TZ 95 EW, the beneficiaries adopted 87.3 %, 94.9 % and 92.8 % respectively while for non-beneficiaries, 25.3

% was for TZ 95 EEW and nil for both TZ 95 EW and TZ 95 EEY. For striga tolerant and VarAcross 97, 55.8 % and 68.1 % were adopted by beneficiaries while non-beneficiaries adopted 15.8 % and 21.8 % respectively. This result is consistent with Voh (1979) in exploratory study of factors associated with adoption of recommended farm practices in Giwa L.G.A of Kaduna State, Nigeria. The low level of adoption among the non-beneficiaries is also consistent with the findings of Ega (1988) in his evaluation of extension activities of the Ayangba Agricultural Development Project. Some crop mixtures demonstrated includes maize/cowpea and maize/soya bean. These technologies were sourced from the relevant research institutes like IAR, Samaru, LCRI, Maiduguri and NCRI, Badeggi. Although, the demonstrations and trials were quite successful, it was still felt that more success could have been recorded or had the research institutes brought in earlier. Therefore, robust agricultural outreach programme collaboration was entered into by the project and IITA to increase crop production through improved technologies.

**Table 3.** Level of adoption of improved crop varieties among Beneficiaries and Non-Beneficiaries of ADB-CBARD Project

Variables	Beneficiaries		Non-Beneficiaries	
	Frequency	Percentage	Frequency	Percentage
<b>Cowpea Variety(n=2)</b>				
IT 93K-45	560	75.1	120	16.1
IT 90K 45-1	653	87.5	48	6.4
<b>Groundnut variety(n=1)</b>				
Ex Dakar	708	94.9	23	3.1
<b>Rice variety(n=2)</b>				
Faro	674	90.3	94	12.6
Nerica	491	65.8	94	12.6
<b>Sorghum ICSV 400(n=1)</b>	689	92.4	119	16.0
<b>Soya bean variety(n=2)</b>				
TGX 1448-2E	654	87.7	95	12.7
TGX 1740-2E	489	65.5	117	15.7
<b>Millet variety(n=1)</b>				
So SAT C88	600	80.4	47	6.3
<b>Maize variety(n=5)</b>				
TZ 95 EEW	651	87.3	189	25.3
TZ 95 EEY	708	94.9	Nil	Nil
TZ 95 EW	692	92.8	Nil	Nil
Striga tolerant	416	55.8	118	15.8
Variety across 97	508	68.1	163	21.8

The collaboration yielded good result e.g., in Magwashi RVA of Katagum L.G.A in Bauchi PIU, maize trial produced 4 cob/plant. However, this area could not grow maize due to climatic constraints, but the introduction of an early

maize variety has encouraged the community to start growing maize.

### Impact of Level of Adoption of Improved Crop Varieties

## Adoption of African Development Bank (Afd) Community- Based Agriculture and Rural Development Crop Production Project among Beneficiaries in Kaduna and Bauchi States, Nigeria

Analysis was carried out to ascertain the impact of the level of adoption of improved recommended crop varieties between the ADB-CBARD Project beneficiaries and non-beneficiaries in the study area. As revealed in Table 4 the F-chow calculated value of cowpea variety IT 93K-45 was 5580.88 while that of tabulated F-value was 2.22, the difference was significant. For IT 90K45-1, F-chow calculated value was 6650.33 while F-value was 2.22, the difference was significant. For groundnut variety Ex dakar, the F-chow value was 3233.12 while the F-value was 2.22, the difference was significant. Also in rice varieties Faro and Nerica had F-chow calculated value of 4688.74 and 27633.31 and F-value of both 2.22. The difference is significant. Sorghum variety ICSV 400 was 3049.69 while F-value was 2.22. The difference was also significant. Soya bean varieties TGX 1448-2E and TGX 1740-2E had F-chow value of 5609.98 and 11064.24 while their F-value was 2.22. The difference was significant also. Millet variety SOSAT C88 had F-chow of 6917.96 and F-value of 2.22. The

difference was significant. For Maize varieties TZ95 EEW, Striga tolerant and Across 97 their F-chow calculated values were 1062.71, 11907.27 and 2061.20 respectively while their F-value was 2.22. Their differences were also significant. Nil was recorded for maize varieties TZ 95 EEY and TZ 95 EW. The analysis shows that most of the crop varieties had their F-chow calculated greater than the tabulated value at 1 % level of probability which implied that ADB-CBARD Project had impact on level of adoption of improved crop varieties between beneficiaries and non-beneficiaries. This result agrees with Idrisa et al (2012) who in their study of the effect of adoption of improved maize varieties on food security in Gwoza Local Government of Borno State, Nigeria found that adoption of improved maize varieties significantly enhanced food security in the study area and it impacted positively on the level of living of the people. Of course, one measure of empowerment is the ability of an individual to solve his/her felt needs which was difficult prior to the empowerment intervention.

**Table 4.** Impact on level of adoption of crops' varieties

Varieties	Mean(%)	SD	CV	SSR <sub>1</sub>	SSR <sub>2</sub>	F-Chow
<b>It93k-45</b>				4.24	1.005	5580.88
Non-beneficiaries	16.09	0.37	2.29			
Beneficiaries	75.07	0.43	0.58			
<b>It90k 45-1</b>				4.39	0.07	6650.35***
Non-beneficiaries	6.43	0.25	3.82			
Beneficiaries	87.53	0.33	0.38			
<b>Exdakar</b>				8.55	0.00	3232.12***
Non-beneficiaries	3.08	0.17	5.61			
Beneficiaries	94.91	0.22	0.23			
<b>Faro</b>				5.36	0.79	4686.739***
Non-beneficiaries	12.60	0.33	2.64			
Beneficiaries	90.35	0.30	0.33			
<b>Nerica</b>				0.343	0.79	27633.31***
Non-beneficiaries	12.60	0.33	2.64			
Adopters	65.82	0.47	0.72			
<b>Iccv400</b>				6.28	2.71	3049.69***
Non-beneficiaries	15.95	0.37	2.30			
Beneficiaries	92.23	0.27	0.29			
<b>Tgx14482e</b>				4.38	0.84	5609.98***
Non-beneficiaries	12.73	0.33	2.62			
Beneficiaries	87.67	0.33	0.38			
<b>Tgx7402e</b>				0.31	2.45	11064.24***
Non-beneficiaries	15.68	0.36	2.32			
Beneficiaries	65.55	0.48	0.73			
<b>Sosatc88</b>				4.24	0.06	6917.96***
Non-beneficiaries	6.30	0.24	3.86			
Beneficiaries	80.43	0.40	0.49			
<b>Tz95eew</b>				4.37	16.09	1062.71***
Non-beneficiaries	25.335	0.4352	1.7179			
Beneficiaries	87.265	0.3336	0.3823			
<b>Tz95eey</b>				8.55	Nil	Nil

## Adoption of African Development Bank (Afd) Community- Based Agriculture and Rural Development Crop Production Project among Beneficiaries in Kaduna and Bauchi States, Nigeria

Non-beneficiaries	0	0	Nil			
Beneficiaries	94.906	0.22	0.2318			
<b>Tz95ew</b>				6.67	Nil	Nil
Non-beneficiaries	0	0	Nil			
Beneficiaries	92.761	0.2593	0.2795			
<b>Striga</b>				0.001	2.56	11907.27***
Non-beneficiaries	15.818	0.3652	2.3085			
Beneficiaries	55.764	0.497	0.8913			
<b>Across97</b>				0.976	11.49	2061.20***
Non-beneficiaries	21.85	0.4135	1.8925			
Beneficiaries	68.097	0.4664	0.6849			

### Analysis of Impact of ADB-CBARD Project on Crop Output, Yield, Income and Level of Living

The chow test statistics was applied to ascertain the project impact on crop output, yield, income and level of living of beneficiaries and non-beneficiaries. The application of the chow test statistics involved obtaining the residual sum of squares from regression analysis which involved beneficiaries and non-beneficiaries separately and pooled as the third regression. If F- chow calculated value was greater than table value then impact was from CBARD Project otherwise impact was outside the project.

As revealed in Table 5 the F- chow calculated value for crop output was 24.66 while that of tabulated F. value was 3.01, the difference was significant. Also for yield, the F-chow calculated value was 31.90 and tabulated value was 3.01. The difference was also significant. The income had F-chow calculated value of 4.40 and tabulated F. value was 3.01, the difference was significant. Similarly for level of living, F-chow calculated value was 42.11 while F. value was 3.01, the difference was significant. The analysis shows that all the variables had their F- chow calculated greater than the tabulated at 1% level of probability, which implied that ADB-CBARD Project had impact on crop output, income, yield and level of living of the beneficiaries. The hypotheses were also

tested and it was discovered that all the variables were significant at 1 % level of probability. Therefore, the null hypotheses were rejected and the alternate accepted. It can be concluded that the African Development Fund-Community Based Agricultural and Rural Development Project had positive impact on the beneficiaries. These results again supports the findings of Musa (2004) and Abdullahi (2010) who reported that the participation in irrigation project significantly improved the living conditions of the beneficiaries through increased crop output and income.

The current findings also supports Bellonet al. (2003) and Musa (2011) who compared level of living between treatment and control groups and found that beneficiaries had better family nutrition, clothing, housing, consumer durables, good drinking water and water pumps than the non-beneficiaries. Agricultural Development Projects have been shown to improve crop productivity, enable households to grow higher incomes and wage rates for family labour, deficit the poor and landless through increased foods availability and lower food prices. The implication is that better income gives better purchasing power and hence the improvements in the level of living. Consequently, it can be concluded that this project as a development and social impact intervention project has achieved the goal for its establishments.

**Table 5.** Chow test result showing impact of project on output, yield, income and level of living

Variable	RSS	RSS1	RSS2	N1	F- ChowFcrit
Output	1.16E+11	1.16E+11	8.71E+09	746	24.66 3.01*
Yield	8.80E+10	8.77E+10	6.60E+09	746	4.40 3.01*
Income	2.31E+14	8.54+13	7.22E+13	746	4.40 3.01*
			Level		
of Living	1.40E+15	1.08E+15	6.33E+13	746	42.11 3.01*

\* $P < 0.01$

### CONCLUSION

Based on the empirical evidence emanating from this study, it could be concluded that the beneficiaries have ageing farming population

## Adoption of African Development Bank (Afd) Community- Based Agriculture and Rural Development Crop Production Project among Beneficiaries in Kaduna and Bauchi States, Nigeria

because the mean age of the beneficiaries was 51.98 years. Although they are within the range in agricultural productive age in Nigeria, yet the fact still remains that Nigerian farming population is ageing. The beneficiaries' adoption level of improved crops varieties was >90% and this positively affected the ADB-CBARD project interventions. Participation in ADB-CBARD project had broadened the knowledge base of the beneficiaries through the advisory services of the programme and this has enhanced their crop output, crop yield, increased their asset base, and increased their income and general improvement in their level of living more than the non-beneficiaries in the study.

### REFERENCES

- [1] Abdullahi, H.A. (2010). Impact of Are-Irrigation Project on Agricultural Production and Livelihoods of People in Rimi Local Government Area, Katsina State. Unpublished M.Sc. Thesis submitted to the Department of Agricultural Economics and Rural Sociology. Ahmadu Bello University, Zaria. Pp 95-98
- [2] Adebayo, C.O (2011). Evaluation of United Nations Development Programs (UNDP) Micro Credit Schemes on Food Security Status of Farm Households in Kaduna State. Unpublished PhD thesis, Department of Agric Economics and Rural Sociology, Ahmadu Bello University, Zaria. Pp45
- [3] Adeolu, B.A. and Taiwo, A. (2004). The Impact of National Fadama Facility in Alleviating Rural Poverty and Enhancing Agricultural Development in south-Western Nigeria. *Journal of Social science*. 9(3): 157-161.
- [4] Amaza, P., Abdoulaye, T., Kwaghe, P. and Tegbam, A. (2009). Changes in household Food Security and Poverty Status in PROSAB Area of southern Borno State, Nigeria. International Institute of Tropical Agriculture (IITA) Promoting Sustainable Agriculture in Borno State (PROSAB) July, 2009.
- [5] Amogu, U. (2004). Emerging Socio-economic Institutional and Policy Factors Likely to influence future intensification of crop-livestock systems in Nigeria. *Journal of Sustainable Crop-livestock Production in West Africa*. 282-298.
- [6] Babatunde, O. (2006). Differential Poverty Reduction, Impact of small-scale Irrigation Development between its Beneficiaries and Non-beneficiaries in Nigeria. Technical Report. on the Agro policy Award. Pp25
- [7] Bellon, M.R.M., Adato, J., Becerril, D. and Mendek, D. (2003). The Impact of Improved Maize Germplasm on Poverty Alleviation: the case of Tuxpeno-derived Material in Mexico. Food Consumption and Nutrition Division (FCNI), Discussion Paper No. 162.
- [8] Central Bank of Nigeria, (1999). Nigerians Development; Poverty Assessment and Alleviation Research Department in Collaboration with the World Bank. Pp.124
- [9] Chikwendu, D.O. (2005). The Need for and Institutionalization of Impact assessment in the Nigerian's Agricultural Research Institutes (NARIS). A paper presented at a Training course organized by Agricultural Research Council of Nigeria. at NAERLS, Ahmadu Bello University, Zaria, 23<sup>rd</sup> – 27<sup>th</sup> February, 2009, pp. 7-8.
- [10] Dauda, G. (2004). Impact of Katsina state Agricultural and Community Development Project in two Local Government Areas of Katsina state. Unpublished M.Sc Thesis. Department of agricultural Economics and Rural sociology, Ahmadu Bello University, Zaria. Pp60
- [11] Dougherty, C. (2007). Introduction to Econometrics. CRC Press. Pp. 146.
- [12] Ega, L.A. (1988). Government Policies and Agricultural Development in Nigeria. A paper presented at a seminar organized by the Faculty of Agriculture for Visiting Agricultural students from U.S.A. 21<sup>st</sup>-22<sup>nd</sup>, July 1988, Ahmadu Bello University, Zaria.
- [13] Ejembi, E. P. and Ejembi S. A. (2005). The Status of the Nigerian Family; Implications for Agricultural Development. *The Family Journal*. 2(1): 30-38
- [14] FOS (2006). Federal Office of Statistics, 2006 National Census
- [15] Idrisa, Y. L., Shehu, H. and Ngamdu, M. B. (2012). Effects of Adoption of Improved Mazie Seeds on Household Food Security in Gwoza Local Government Area of Borno State, Nigeria's. *Global Journal of Science Frontier Research*. 12(5): 7-12
- [16] Ijere, M.O. (1988). The Future of Co-operatives in Developing Countries: A Case Study of Co-operative Management in Nigerian Agricultural Administration. 1(3):169-79.
- [17] International Fund for Agricultural Development (IFAD, 2010). Federal Republic of Nigeria; Country Strategy Opportunity Programme, Report Review of Executive Board, Ninety-ninth Session, Rome, 21<sup>st</sup>-22<sup>nd</sup>, April, 2010. Pp. 1-75
- [18] Musa, J.D. (2004). Effects of Irrigation practices on the rural life. Dobby Publishers, Lagos, Nigeria pp 122-136.
- [19] Musa, R.S. (2011). Impact of Fadama II Development Project on the Income of Benefitted, Marginalized and Vulnerable

## Adoption of African Development Bank (Afd) Community- Based Agriculture and Rural Development Crop Production Project among Beneficiaries in Kaduna and Bauchi States, Nigeria

- Groups in Kaduna State. Unpublished Ph.D Dissertation. Department of Agricultural Economics and Rural Sociology, Ahmadu Bello University, Zaria, pp. 4.
- [20] National Bureau of Statistics (NBS) (2012). Poverty and agricultural sector in Nigeria. Federal Republic of Nigeria.
- [21] National Bureau of Statistics (NBS) (2013). Poverty and Agricultural Sector. Federal Republic of Nigeria.
- [22] Olayide, S.O. (1980). Agricultural Policy for Nigerian Small Farmers. In: Nigerian Small Farmers: Problems and Prospects in Integrated Rural Development. Edited by S.O. Olayide, J.A. Ewaka and V.E. Bello-Osagie, CARD 1980.
- [23] Olukosi, I. E. (2002). The application of Community Driven Development Approach in Nigeria, lead Paper. The Sensitization/Mobilization Workshops for Federal, State and local Government Staff on the FGN\IFAO community-Based Agricultural and Rural Development programme (CBARDP) in Nigeria
- [24] Simonyan, J. (2010). The Impact of Fadama II Project on Income & Productivity of Beneficiaries of farmers in Kaduna State. Unpublished PhD Dissertatio., Department of Agricultural Economics and Rural Sociology, Ahmadu Bello University, Zaria. Pp 2-5
- [25] Smith, D.M. (1977). Human Geography: A welfare Approach. London, Edward Arnold Publishers, U.K. pp 10
- [26] Taimi, K. K. (2003). Strategy for Professionalization of Rural Development. Tamindu Journal of development. 9: 269-304
- [27] Tomori, S., Akano, O., Adebisi, A., Ishola, W., Lawanson, O. and Quadri, O. (2005). Protecting the poor from macroeconomic shocks in Nigeria. An empirical Investigation and Policy Options. A study commissioned by the Global Development Network (GND) under the auspices of an International Research Project on Macroeconomic Policy Challenges of Low Income Countries. Nigeria, January, 27<sup>th</sup>, pp 1-64. Accessed 4<sup>th</sup> July, 2011.
- [28] United Nation Development Programme (UNDP) (1997): Human Development Report. New York; Oxford University press.
- [29] Voh, J. P. (1979). An explanatory study of Factors Associated with Adoption of recommended Farm Practices among Giwa Farmers. Samaru Miscellaneous Paper No. 73, Institute for Agricultural Research, Ahmadu Bello University, Zaria. Pp 10
- [30] Wikipedia, the Free Encyclopedias (2013). Livelihood. Retrieved from [www.wikipedia.org](http://www.wikipedia.org). Accessed January 15<sup>th</sup> 2013.
- [31] Williams, S.K.T. (1978). Rural Development in Nigeria. University of Ife Press, Ile-Ife, Nigeria, pp. 75-76.
- [32] Yahaya, M. K. (2002). Development and Challenge of Bakalon Irrigation project in Sokoto State. Nigerian Nomadic Journal of African Studies. 11(3):411-430.

**Citation:** Chikezie, N.P, Omokore, D.F. and Akpoko, J.G." Adoption of African Development Bank (Afd) Community- Based Agriculture and Rural Development Crop Production Project among Beneficiaries in Kaduna and Bauchi States, Nigeria", *International Journal of Research in Agriculture and Forestry*, 5(9), pp14-26.

**Copyright:** © 2018 Chikezie. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. 26