IMPACT OF COMMUNITY BASED AGRICULTURE AND RURAL DEVELOPMENT PROJECT ON CROP PRODUCTION AND OTHER FORMS OF RURAL LIVELIHOODS IN KADUNA AND BAUCHI STATES, NIGERIA

BY

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(PhD/AGRIC/10357/2010-11)

A THESIS SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES AHMADU BELLO UNIVERSITY, ZARIA, IN PARTIAL FULFILLMENT OFTHE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF DOCTOR OF PHILOSOPHY IN AGRICULTURAL EXTENSION AND RURAL SOCIOLOGY

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DECEMBER, 2015

DECLARATION

I hereby declare that this Thesis titled **"Impact of Community Based Agriculture and Rural Development Project on Crop Production and Other Forms of Rural Livelihoods in Kaduna and Bauchi States, Nigeria"**, was written by me and it is a record of my research work. No part of this work has been presented in any previous application for another degree or diploma at this or any other institution. All borrowed informationhas been duly acknowledged in the text and a list of references provided.

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CERTIFICATION

This Thesis titled **"Impact of Community Based Agriculture and Rural Development Project on Crop Production and Other Forms of Rural Livelihoods in Kaduna and Bauchi States, Nigeria"** by Patience Ngozi CHIKEZIE meets the regulations governing the award of the Degree of Doctor of Philosophy of the Ahmadu Bello University, Zaria and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

This work is dedicated to God- the fountain of knowledge and wisdom; my husband, Emma and to my lovely children,Amarachi,Nnaemeka, Kelechi, Chiamaka and Abigail.

ACKNOWLDGEMENTS

I give God all the glory for seeing me through the rigours of this academic exercise. My unalloyed gratitude goes to my supervisory committee members: Professor D.F. Omokore, Professor J.G. Akpoko, and Professor R.A. Omolehin for their tireless efforts and criticisms throughout the period of this work. I am indebted to Dr. M.A. Damisa and Professor B.O Ogunbameru who encouraged me to register for this degree. My profound appreciation goes to Professor. M.O. Akinola, Professor T.K. Atala, Late Professor T.I.O. Ogunfiditimi, Professor Ben Ahmed, Professor Z. Abdulsalam, Dr. B.M. Sani, Dr.O. Yusuf and Dr. A. Keinde for their encouragements.

I am grateful to Mrs. M. Azaka, Dr. T.O. Fadiji, Mr. J.Chikaire, Mr. E. Dodo, Mr. SholaOyewole, Mr. A. Gomina, Mr. S. Abdulrahman, Mrs. Hauwa Yusuf, Mrs. Hanatu Yusuf, Mrs. F.O. Alozie, Mrs. G.C. Mpieri, Mr. S. Abubakarand Mr. SaniAbubakar of Kaduna ADP and Bauchi ADP respectively. I appreciate the efforts of all the staff of the Department of Agricultural Economics and Rural Sociology for their encouragement. I am grateful to my mother, Mrs. Christiana Ogueri and my brothers Charles, Iyke, Ugo and Ndy. Finally, I sincerely appreciate the patience of my husband and children during my long absence from home.

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ABSTRACT

This study was conducted to assess the impact of the Community Based Agriculture and Rural Development Project on crop production and other forms of rural livelihoods in Kaduna and Bauchi States, Nigeria. Primary data for the study were collected using well-structured questionnaire, administered to 746 beneficiaries and 746 non-beneficiaries. Descriptive statistics, logit regression and Chow test – statistic were used to analyze the data. Results showed that the level of adoption of recommended crop varieties was high. About 75.1% of the beneficiaries adopted cowpea variety IT 93K-45 and92.4% adopted Sorghum ICSV 400. All the adoption level impacts were highly significant at 1% level of probability. The results of logit regression estimates also indicated that age, farm size, farming experience, membership of cooperative societies, extension contact and access to input were all significant at 1% level of probability and influenced beneficiaries' adoption of recommended crop varieties by 42% in the ADB-CBARD Project Interventions. 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 rural wage earning opportunities created by the project as reported by the respondents in the study area included petty trading, crop processing and milling, commercial transportation, water vending, craftwork, bricklaying, seed multiplication, hired labour and animal traction. Constraints encountered by the beneficiaries as they participated in the project were inadequate capital, inadequate processing and storage facilities, low western literacy level and low prices for farm produce. The following recommendations were made: promotion of savings among farmers and farmer groups should be encouraged as well as encouraging the social organisation to secure loans for their members from agricultural banks. Commodity market/produce user programme and processing industries should be established to handle excess farm produce. Government should create awareness amongst the farmers conceiving the newly established agricultural cargo airports nearest to them. The cost of agro chemicals should be subsidized. Feeder roads should be constructed. Recreation facilities like viewing centres and rural telephony should be encouraged and a functional umbrella organisation for farmers is required to handle issues of capacity building for farmers.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

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 ADF CBARDP include to:

(i) empower poor rural women and men to critically analyze their constraint, opportunities and support requirements

(ii) to increasingly effectively manage their own development.

(iii) 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

(iv) support balanced sustainable social, agricultural and economic development interventions for the appropriate village women's and men's groups and individuals (PIUs, 2006).

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 27selected 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.

1.2 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). One of the suggested ways of reducing poverty is utilizing of the poor factor endowment for improved income earnings and in living standards. In other words enabling the rural poor to increase their level of production of economic foods to increase their income level and thereby their living standards (Adeolu and Taiwo, 2004).

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 Fund loan was declared effective in December, 2003 and the first disbursement was done June, 2006. The ADB-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 ADB-CBARDP set out to address this by making technologies available to farmers in a section of Nigeria where such technical capacity was considered low. ADB-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 study therefore intends to provide answers to the following questions:

(i) What are the socio-economic characteristics of beneficiaries of ADB-CBARD Project in the study areas?

(ii) What is the level of adoption of improved crop varieties by beneficiaries of ADB-CBARD Project in the study areas?

(iii) What are the socio-economic and institutional factors influencing adoption of ADB-CBARDproject interventions?

(iv) What is the impact of the Project on farm crop output, yield, income and level of living in the study areas?

(v) What is the extent of rural employment opportunities benefited by farmersfrom the ADB-CBARD project in the study areas?

(vi) what are the constraints encountered by the beneficiaries of theADB-CBARD project in the study areas?

1.3 Objectives of the Study

The broad objective of this study was to analyze the impact of Africa Development Fund- Community Based Agriculture and Rural Development Project on crop production and other forms of rural livelihoods in Kaduna and Bauchi States, Nigeria. The specific objectives were to:

(i) describe the socio-economic characteristics of beneficiaries ofADB-CBARD Project in the study areas;

(ii) assess the level of adoption of improved crop varieties by beneficiaries ofADB-CBARD Project in the study areas;

(iii) determinesocio-economic and institutional factors influencing adoption of CBARD project interventions;

(iv) determine the impact of the project on crop output, yield, income and level of living of beneficiaries ofADB-CBARD Project in the study area;

(v) assess the extent of rural employment opportunities benefited by the farmers from the ADB-CBARD project in the study areas;

(vi) describe the constraints being encountered in the implementation ofthe African Development Fund Community Based Agriculture and Rural Development Project (ADB-CBARDP) in the study areas.

1.4 Justification of the Study

Agricultural production has played an important role in the development of Nigeria economy by providing employment opportunities, food, raw materials and shelters to about 70 % in the Nigerian population (APR, 1991). However, the declining state of agricultural production and income level of Nigerian rural populace as well as the concerns to reduce poverty among rural farmers have therefore led to the establishment of ADF CBARD Project in the (5) states of the Federation. The main thrust of ADF CBARD Project 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 knowledge of the impact would certainly help to determine the level of achievement of the project. It is obvious that for any project to justify its existence, its impact on the target population must be known. The study is therefore intended to unveil the real situation of the project beneficiaries and fill the gap created by the present dearth of data on the activities and impact of the project in the study area. A lot of money has been expended both by the Federal, States, Local Government Areas and Communities on benefiting areas to ensure that the beneficiaries are empowered to utilize resources more efficiently, acquire productive assets, have access to marketing, infrastructure, adopt output enhancing techniques, strengthening their capacity, establishment of rural non-farm enterprises and improving mechanism for conflict resolution. Nevertheless, there is the need to determine if these resources were used efficiently and effectively to produce any positive impact on the beneficiaries in terms of improved crop output, yield, income and livelihoods. Development in itself is also becoming increasingly complex and requires a learning approach. Feedback is required on what works, what does not work and how programmes and strategies can be readjusted to become more effective in reaching beneficiaries.

Bauchi and Kaduna States were selected for this study, based on the level of high number of beneficiaries, similarity of intervention programme and of course the project took off simultaneously in the two States. The study would take cognizance of empirical questions generated by the research problem which would translate to appropriate answers that would enhance the livelihood of the rural people.

The findings of this study would assist in evaluating the effectiveness of Community Based Agriculture and Rural Development Projects in increasing or improving beneficiaries' outputs, income and rural livelihood. Similarly, findings of this work

would be used as a basis for evaluating the methods of implementation of other similar projects. Also it is envisaged that the statistical tools like descriptive statistics, logit regression model and chow test statistics used in this study would help to provide a measure for assessing the impact of agricultural based projects as well as help in the investigation of the relationship that exists among the variables which can help to validate the use of these tools in further research work. Policy makers at all levels of government would benefit from the information gathered in this study especially with respect to agricultural development policy aimed at food sufficiency and poverty alleviation. The study would serve as a good reference point by researchers in the area of agriculture with particular reference to impact assessment studies.

1.5 Hypotheses of the Study

The following hypotheses were tested in the study:

(i) There is no significant relationship between benefitting from ADB-CBARD Project interventions and crop output.

(ii) There is no significant relationship between benefitting from ADB-CBARD Project interventions and crop yield.

(iii) There is no significant relationship between benefitting from ADB-CBARD Project and income from crop production.

(iv) There is no significant relationship between benefitting from ADB-CBARDProject and level of living.

CHAPTER TWO

LITERATURE REVIEW

2.1 Agricultural Development

Agricultural development may be conceptualized as one dimension of the multi-faceted complex process of development that aims at enhancing the productive capacity of the agricultural sector through the transformation of the rural economy from being a peasant, subsistence agricultural economy to a modern commercialized agricultural enterprise. Mosher (1976) defined agricultural development as increase in agricultural production expressed either in physical or monetary terms which is brought about by small changes over larger areas. He further stated that agricultural development is not only growth but growth plus change. This change is social, cultural and institutional as well as economic in nature. Mosher (1976) reiterated that such development will enable the benefits of growth to be distributed equitably amongst the whole population and permit an increase in real level of living of the people.

In the developing countries, agricultural development represents the main component of rural development programmes. The enhancement of the productive capacity of the agricultural sector for increased sustainable agricultural production will require substantial modifications in the age-long traditional method of farming as well as the generation of appropriate agro technologies through research. In his opinion Ayichi (1995) Stated that agricultural technology is the application of mechanical, chemical and biological inputs such as tractors, fertilizers, agro-chemicals, livestock breeds, high yield crops, storage and processing facilities, to increase food production. Arnon (1987) opined that agricultural development is possible basically in two different

ways which are, however, not mutually exclusive; bringing more land under cultivation and increasing productivity per unit of land. The first alternative is possible without changing traditional farming methods, whereas the second is entirely dependent on applying improved farming techniques. In this lies the essential difference between the significance of land for the traditional farmer and for the modern farmer, the modern farmer can, to a large extent, increase production on a given area by using appropriate inputs, such as fertilizers, irrigation, drainage etc., so that, in his case, land can be partly replaced by know-how and capital. For the traditional farmer, land is the most important means of production and his only guarantee of survival (Arnon, 1987).

Agricultural development is needed in almost every country of the world today, especially in the developing countries. The race between increasing population and mankind's food supply is real and grim. Agriculture is the only way we now know to produce the food on which our very lives depend (Mosher, 1966). Agricultural development aims at sustaining a vibrant and dynamic rural economy as well as guaranteeing local food sufficiency and other products for export. Agricultural development aims at sustaining an improved quality of human life in society especially those of the farmers. To this extent, agricultural development is increasingly being recognized as part of the larger national development plans or budget in which various development programmes are spelt out for accomplishment within specific periods. Ekong (2003) revealed that in such national development plans, agricultural development features prominently including policies on land use, improvement in productivity, and establishment of industries allied to agriculture, irrigation schemes, marketing and pricing policies, agricultural education and general rural development.

Agricultural development is also seen as an integral part of general, social and economic development (Mosher, 1966). The major factors that affect agricultural development are identified and distinguished between those that are essential and those that can accelerate development in those places where the essentials have been met. The five essentials for agricultural development are; market for farm products, constantly changing technology, local availability of supplies and equipment, production incentives for farmers and transportation, the five accelerators for agricultural development includes: education, production, credit, farmer's association, land development and national planning for agricultural development. Importantly, too, agricultural development can be seen as a logical response to the challenging problems of the rapidly changing global environment especially those of climatic change, population growth and increasing poverty conditions (Ekong, 2003).

From these definitions, it can be deduced that agricultural development encompasses a highly complex process of expansion and structural change. In other words, agricultural development embraces the following increase in agricultural production expressed in physical monetary terms which are brought about by small changes over large areas, agricultural growth change and distribution of benefits of growth equitably among the whole population to permit increase in real standards of living. If development is for the people, they must therefore understand how their needs can be met. To understand how their needs can be met means that they have to participate in the development programme especially agricultural development (Brown, 1979).

2.2 Community Development

Community development could be conceived as conscious and deliberate utilization of the natural resources and application of technologies in the social and economic activities of man for overall transformation of the socio-economic well-being of members of a social system (Apantaku and Adebowale, 2011). The definition suggests introduction and application of necessary plans and strategies, and modern facilities that could bring about transformation of a social system. Similarly, Ekong (2003) conceptualized community development as conscious and deliberate effort aimed at helping communities recognize their needs and to assume responsibilities for solving their problems thereby increasing their capacity to participate fully in the life of a nation. In other words, it refers to any concerted action taken by an agency or members of a social system themselves with the primary aim of bringing some benefits to the social system. Community development according to Nwoko(1992) can be seen as evolving the improvement of a community's system of values, its structures as well as the usages through which it functions and is sustained. It is essentially a process in which the people plan and act together for the satisfaction of their felt needs by bringing about improvements in the life of the people through changes in the conditions of the community. Ekong (2003) noted that The United Nations in 1956 adopting both multidimensional and integrated ideological approaches defined community development as the process by which the efforts of the people themselves are united with those of governmental authorities to improve their economic, social and cultural conditions.

Furthermore, Ekong (2003) defined community development as a movement through community initiated development programmes and facilitation of active participation of community members in the execution of the programmes. In essence, as opined by Apantaku and Adebowale, (2011) community development is about self-help, mutual support, up building of neighborhood integration, development of neighborhood capacities for problem-solving and self-representation and promotion of collective action to bring a community's preferences to the attention of political decision-makers for socio-economic-building actions to be taken. In addition, they observed that community development implies first the eradication of poverty, unemployment, underemployment, ignorance and diseases and secondly, the political mobilization of people, increasing the level of their cognition, making them politically and socially conscious and increasing the level of their political efficacy.

2.3 Backgroundto CBARD Project

Community based agriculture and rural development project being a development project targets the rural poor based on participatory community demand driven approach. It has the overall objects of contributing to food security and increasing access to rural infrastructure facilities in the project selected areas. The goal is to reduce poverty through improvement of the livelihood and living conditions of the rural poor.

The objectives include to:

(i) Empower poor rural women and men to critically analyze their constraint, opportunities and support requirements, and to increasingly effectively manage their own development.

(ii) 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,

(iii) 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 of Kaduna, Bauchi, Adamawa, Gombe, and Kwara. The loan was declared effective in December 2003 and the first disbursements was June, 2006 (PIU, 2006). The project ensures community participation in the design and implementation of the project activities and sustainability, by providing the institutional support that will enable service providers to participate effectively and more responsive to the desires of the rural village areas (RVAs) using community driven development (CDD) approach, which was seen as the most efficient and effective approach to poverty alleviation in Nigeria and subsequently in the implementation of CBARD Project (PIU, 2006). The declining basic indicators of poverty and experience from previous projects and field observations indicate that poverty in rural areas in the Northern region of Nigeria is becoming more widely entrenched. Traditional approaches to poverty alleviation through rural development including projects focusing on a small area, cannot have a major impact on poverty as they cannot mobilize sufficient external resources to assist a large target group, do not ensure a high proportion of funds reach the target groups, do not make use of existing government programmes and resources at community, local and State government

levels to improve the effectiveness of rural development in Northern Nigeria. The project is driven by the following imperatives:

Empowering poor rural communities to identify their own priority needs and then implement, monitor and asses that their needs are being addressed using FederalGovernment of Nigeria (FGN) resources already committed to rural development. This process is community driven development. Strengthening local government management and technical capacities to assume their frontline responsibility for agricultural and rural development, reorienting service providers and managers of government funding to respond to communities needs and work with communities to deliver these services more effectively so that more resources targeted at rural poverty reach the target group more quickly, institutionalizing government resource flows to rural communities for poverty alleviation,ensuring efficient and transparent management of agricultural and rural development (PIU 2006).

2.4 Strategies and Trends of Agricultural Development in Nigeria

The importance of giving greater priority to agriculture has in recent years been recognized by the policy makers in Nigeria as agriculture is and will continue to be the dominant sector of the economy. Agriculture will continue to be the major employer of labor, major source of food for the fast growing population and raw materials for the growing agro-allied industries, and generator of savings and tax revenue to support the development of other sectors of the economy and to earn more foreign exchange and/or save foreign exchange (World Bank, 1996). Agricultural development may be defined as a continuous process of making conscious and systematic attempts to utilize the agricultural resources of a nation in order to benefit agricultural workers and farmers in

particular and the entire population in general. In the developing or less developed countries of the world, the process of agricultural development is held to be synonymous with the process of transformation, that is, the structural change of an economy from pristine agricultural subsistence to investment – dominated agriculture. Viewed in this way, agricultural development becomes a modernization process Famoriyo (1979). An agricultural development policy therefore represents a social measure articulated, formulated and poised for implementation in order to achieve certain desirable objectives in the agricultural sector. It is also valid to conceive agricultural development policy from the dimension of being a function of beliefs, values and goals (Olayide, 1980). The quest for agricultural/rural development has been a preoccupation of both academics and policy markers. As rightly noted by Lele and Adu-Nyako (1991) notwithstanding the recent decline in urban level of livings experienced in most African countries, poverty in Africa is predominantly a rural phenomenon".

New poverty estimates published by the World Bank (2010) revealed that 1.4 billion people in the developing world (one in four) were living on less than $1.25 a day in 2005, down from 1.9billion (one in two) in 1981. The new numbers show that poverty has been more widespread across the developing world over the past 25 years than previously estimated, but also that there has been strong – if regionally uneven – progress towards reducing overall poverty.

Agricultural development in Nigeria was vigorously pursued by various regimes of government through several strategies and initiatives. While some of the strategies were built into the overall national development plan by the individual governments that

enunciated them, some others emerged as government strategic responses to imminent or prevailing conditions in the agricultural sector at definite points in time. In recognition of the above, various governments of Nigeria have tried several programmes, approaches and strategies aimed at improving the conditions of the rural poor. While some of the efforts are yet on-going, many have since gone moribund. They include among others the following:

2.4.1 Farm settlement schemes:

Soon after independence in 1960, the first national Development Plan (1962 – 1968) was introduced and implemented by the first indigenous Nigerians government. The plan provided for farm settlements as agricultural development strategy to further advance the cash crops production systems introduced by the colonial government. Tree crop plantations, vast hectares of arable cash crops, cattle ranches, extension service as well as fertilizer and credit supply systems were put in place by government to boost the scheme. The entire economy of Nigeria at independence was built around agriculture from the effort and capabilities of peasant farmers and small scale traders, and from the vast renewable natural resources (Ekwe, 2011).

Two farm settlement schemes were differently initiated by the Western Nigeria government in 1959 and later by the Eastern Nigeria government in 1962. The Western one was started to achieve increased agricultural production. A priority was given to a land settlement scheme modeled on the Israeli Moshav (Okuneye and Idowu, 1990). The Moshav was a major tool for the absorption of mass immigration in rural Israel in the early 50s - in western Nigeria, the rate of expansion of agricultural output was decreasing and unemployment figures were rising, mainly due to the introduction of

free primary education. In order to increase agricultural output and against the background of wide-scale unemployment, especially of primary school leavers, United Nations experts, as well as Nigerian leaders, thought it reasonable to apply the experience of the Israeli Moshav to Western Nigeria. According to Okuneye and Idowu(1990), the basic objectives of the scheme were: to test, and later demonstrate, carefully planned farming systems designed to attract the educated youths, to demonstrate that by careful planning, farms could be established and operated by young educated farmers with reasonable assistance through advice and loans from the government or other sources and to develop a new agricultural extension approach with a view to accelerating agricultural development in the region. Consequently, the Regional Government acquired land from local chiefs and native authorities. However, due to political pressures, the government established twenty five settlements instead of the thirteen recommended ones. In Eastern Nigeria, on the other hand, each farm settlement comprised an area of between 3,200 to 4,800 ha. Large blocks of land suitable for tree plantations were sub-divided into individual holdings of between 4.8 to 5.8ha arid managed under supervision. The settlers lived in planned model villages of up to 120 families and six villages were scheduled for each settlement (Okuneye and Idowu, 1990). An average sized village covered about 48ha. In addition to the plantation blocks, each farm family had up to 1.2ha of compound land for the cultivation of subsistence food crops and the rearing of some livestock and poultry.

2.4.2 National accelerated food production programme (NAFPP):

This programme was put in place in 1972 to address the problem of domestic food shortage as evidenced by sharp rises in food prices brought about by lowered agricultural productivity due to the fact that soon after the civil war, educationally

qualified persons and trained artisans developed an attitudinal shift to other means of living than farming as witnessed by the surging proportion of village youths migrating to the urban centers for white collar jobs (Ekwe, 2011). Also, the petroleum oil sector was at the same time rapidly developing at the expense of agriculture. During this era, agriculture declined to about 35% of the Gross Domestic Products (GDP) (Mijndadi, 1991). The programme was designed to stimulate farmers to accelerate the production of maize, rice, guinea corn, millet, wheat, cassava and cowpea through the introduction of high yielding varieties, appropriate qualities and quantities of fertilizers, insecticides, herbicides, supporting credit, marketing, storage and processing facilities, thereby ensuring crop production increases and abundance of food at reasonable costs (Mijndadi, 1991).

In spite of the difficulties in removing farmers' resistance to increase crop productivity, studies conducted in some parts of the country revealed some success of the NAFPP. For example, an assessment by Akinbode*et al.* (1988) in Okuneye and Idowu (1990) pointed to the NAFPP as the best community development strategy ever adopted for crop production in Nigeria as it brought agricultural researchers, extension workers and farmers together in a cooperative effort to improve crop production.

Even though the evaluation of the NAFPP has not reflected a constantly positive effect in all cases, there is evidence that the scheme contained some essential elements of a functional rural community development strategy which has been instrumental for improving the production of some specific crops in Nigeria. However, lack of commitments on both State and federal governments resulting in poor funding led to gradual death of an otherwise, excellent concept. In addition, the basic problem is not

addressing the small-scale farmers and existing farming systems contributed to the programme being unsuitable. However, this programme was the first attempt to get farmers involved in some form of field research (Mijndadi, 1991).

2.4.3 Operation feed the nation programme(OFN)

The 3rd National Development Plan of 1975 – 1980 essentially pursued an agricultural policy which favored the establishment and consolidation of agro-research institutions to backstop the extension services for dissemination of improved farm practices. Unfortunately double successions of military regimes during this period distorted the thrust of agricultural policy managers in consolidating on the gains of the previous strategies. The consequences were the drastic shortage of food and the accompanying large scale food importation while the country's volume of export of agricultural produce nose-dived sharply. The Operation Feed the Nation (OFN) was initiated and implemented between 1976 and 1979 to popularize agriculture especially among Nigeria elites and ensure abundant food production through a mass oriented approach (Adebayo and Okuneye, 2005). The short lifespan of the programme along with its uncommon synonym with Obasanjo Farms have made doubtful its purpose and achievement.

Wilmot (1979) in his own view maintained that the results of the operation feed the nation could not have been otherwise, given the disarticulated structure of the economy. He conceded that the introduction of Operation Feed the Nation (OFN) was based on a sound premise, aiming as it did at elimination of all aspects of external dependence. But he was quick to add that premises are no use if they fail to precipitate institutional structures which inform the goals and values enunciated in such premises.

2.4.4 River basin development authority (RBDA)

The Federal government of Nigeria on realizing that the rain-fed farming might not sufficiently meet the country's demand for food and fiber, embarked in the early 70s on the River Basin Development Scheme. The scheme was to harness the country's water resources by providing employment opportunities through intensified crop, livestock and fish production with the hope of improving the rural standards of living (Williams, 1978 in Okuneye and Idowu, 1990). To achieve this aim, attempts were made near dam, rivers and streams to irrigate farm lands and settle farmers who would organize themselves into productive cooperatives and make more productive use of the available resources in their natural habitat. Each River basin was involved in direct community development extension services, input procurement and marketing operations. This, of course, created some second generation problems rather than directly improving crop production. According to Okuneye and Idowu (1990) another short coming of the scheme was the propensity of each State of the federation to establish its own river basin without adequate calculation in terms of funds, personnel, materials and programme contents. In view of the heavy capital involvement of the scheme, however, the federal government by the end of 1985 reduced the number of river basins from 18 to only 9. Recently, they have been robbed of their agricultural extension activities as they now have to concentrate on water projects for agricultural and other uses.

Similarly, Omokore (2009) posited that many farmers simply could not finance the purchasing of all the necessary inputs, such as water, seed, tractor hire, fertilizer and

labour. So they hired their irrigated land out to others or left it to fallow. Therefore, the performance of irrigation programs on Nigeria when viewed against the question raised earlier has not substantially mitigated poverty within the affected communities in spite of their impact on farming systems. They altered rural employment patterns, but they also have the tendency to generate unemployment and underemployment among certain segments of the community.

2.4.5 Green revolution programme (GR)

Between 1980 and 1985, the contribution of the agricultural sector to the nations' GDP stagnated at 30%. Thus, it became implicitly necessary that a clearly defined national agricultural policy be introduced to interface with the fourth national Development Plan (1981 – 1985) and squarely address the issue of little or no growth recorded in agriculture in the country vis-à-vis the fast moving oil sector. This programme commenced in 1980 as an initiative of the federal government to benefit from the successes recorded in south-east Asian countries in high input large scale agriculture. To date, many scholars continue to debate how the world came to attempt such an unsustainable approach to agriculture as the main strategy for rural transformation (Adebayo and Okuneye, 2005).

2.4.6 Agricultural development programme (ADP)

The Agricultural Development Programme (ADP) is perhaps the boldest attempt by the federal government to pursue integrated rural development on relatively long-term basis (Ayichi, 1995). Concurrently with the river basin Development Schemes in the 1970s and up to date, the Agricultural Development Projects (ADPs) were established and grew to be the main thrust of the Nigerian government intervention in small-holder

agriculture. This strategy according to Okuneye and Idowu (1990) was to concentrate on improved practices and services in the form of a package in a selected area known to have a good potential for agricultural development. The projects were designed to improve the traditional systems of production and raise productivity by easing constraints on input supplies and rural infrastructure. Okuneye and Idowu (1990) noted that ADPs were experimented with as integrated rural development programmes in gombe, Gusau, Funtua, Bida, Ekiti-Akoko, Lafia, Ayangba, Ilorin and Oyo North but later adopted nationwide in the 1980s.

Unlike the farm settlement schemes, the ADPs contact the existing farmers on their land and do not settle new farmers. A common feature of the projects is the adoption of the Training and Visit (T & V) system of agricultural and community development extension. The agricultural Development Programme are currently operated throughout the nation as joint ventures between the States, the federal government and the World Bank. Akinbode (1988) noted that those farmers who selectively adopted the components of project packages, particularly in the first generation ADPs, obtained significant increases in crops and income, mainly through the use of fertilizers and to some extent, improved crop varieties. The ADPs according to Okuneye and Idowu (1990) seemed to have a significant impact especially on the production of maize, millet, sorghum and groundnuts. With the introduction of the Structural adjustment Program (SAP) and the launching of several rural community development related programmes such as “Women In Agriculture” and “Better Life for Rural Dwellers” programmes, the ADPs seemed to have made a tremendous impact by quantitatively and qualitatively increasing productivity in the areas of crop cultivation, processing and storage.

The production and processing of cassava tubers into various food items, particularly gari and *fufu*, is a good case in point. Almost every rural household, as well as a good number of households in the urban areas, are individually or cooperatively growing cassava and using certain kinds of home-made or locally fabricated equipment to process it into gari or *fufu*. The peoples' positive reaction to crop production was concomitant with the slogan "grow what you eat", a message sent by SAP, which seems to have been well received by millions of rural and urban dwellers in Nigeria. Granted that the ADP concept also implies an integrated approach to developing agriculture and the entire rural community as a whole, achievement in the construction of the farm service centers and feeder roads has also been remarkable (Okuneye and Idowu, 1990).

Specifically, Voh (1979) noted that many farmers relying on 1-2 hectare plots could not afford to take these risks and make themselves dependent on bought seeds which needed a lot of fertilizer, and were not drought resistant in an environment where both the rains and market were unpredictable. However, the ADP system is currently performing at rates far less than they did at the expiration of the World Bank component of their funding (Adebayo and Idowu, 2000). Omokore (2009) emphasize that the consequence of all these, was underperformance and failure. Since the World Bank assistance to the ADPs has more or less ended, the farmers are left with no option than to grapple with inadequate input supply and adulterated chemicals.

2.4.7 Directorate of food, roads and rural infrastructures (DFRRI)

This programme was established by Decree No. 4 of 1986 with a determined focus on the development of the entire rural areas of Nigeria in order to improve the quality of

life of the rural dwellers. The creation of this directorate according to Okuneye and Idowu (1990) was perhaps the greatest practical measure towards the development of rural communities in Nigeria. While some form of programmes were evolved in the past towards the development of the rural areas, they were not as integrated and properly backed up as the Directorate of Food, Roads and Rural Infrastructure. Essentially, the DFRRI at the federal level coordinates and finances the activities of the State Boards. Okuneye and Idowu (1990) reiterated that the main elements of DFRRI's activities were: construction of rural roads i.e. feeder roads to enhance the transportation of farm inputs, other materials and agricultural produce from rural to urban areas or vice versa:, development of rural housing using local materials which the rural dwellers can afford, implementation of rural electrification programmes, provision of seeds, fingerlings, cuttings, etc through multiplication programmes in order to increase their supply and eventually reduce the price of these inputs, construction of dams, dykes, boreholes and earth wells to produce water for human consumption and for agriculture and other uses. They opined that the DFRRI carried out these programmes throughout the country, through the local government. However, it has been observed that most of the programmes were executed with little or no inputs from ultimate users or intended beneficiaries. Hence, some of the materials and services are either not used or under-utilized. As a majority of the target groups were not involved when the planning and construction of the infrastructures were carried out, they lacked self-commitment to maintain them. In general, even though some degrees of achievement have been recorded in certain States, available evidence confirms that there is room for improvement, particularly in terms of good roads, provision of other infrastructures and even supply of agricultural inputs (Okuneye and Idowu, 1990).

Omokore, (2009) noted that a critical analysis of the impact of DFRRI between 1986 and 1993 revealed that while some quantitative achievements were recorded in the area of infrastructural development, the effectiveness of the project leaves much to be desired. According to him, this was attributed to hasty planning and faulty implementation of some of the projects. DFRRIs underperformance could be traced to over involvement of the Directorate in many programmes, inadequate funding, greater emphasis on quantity than quality, diversion of resources, poor feasibility studies. Problem of conceptualization and defective operational methods. Some interventionists' strategies in the agrarian situation since the post-independence years in Nigeria have been implemented. The rhetoric according to Omokore (2009) is that intervention policies are designed to help the small farmers increase food production and improve rural life. He reiterated that the reality is that although Nigeria's agricultural policy dwelt on small scale farmers, policy implementation usually focused on owners of larger farms tagged the bureaucrats in order to achieve a rise in food production. The progressive farmers approach ignored the mass of the rural population.

Rural development programming seems inevitable for any agrarian economy that aspires to become industrialized. However, according to Ladele (2005), there however, may not be a single paradigm suitable for all-purpose and nations. Each nation will therefore have to look inward to design appropriate strategy on the basis of its peculiarities and developmental antecedents. According to Food and Agricultural Organization (FAO, 1985), "people are every nation's most important resource. Their production and consumption are the driving forces behind national development. A nation in which a large part of the population suffers the scourge of poverty cannot hope

to reach its full potential."Therefore, the Community Based Agriculture and Rural Development Project are based on the following core principles.

(i) A participatory approach to cater for the needs of the communities and the development of the capacity at community and local government level.

(ii) Development of a common vehicle for transferring resources to the local communities

(iii)Policy dialogue and support for the decentralization process.

(iv)Sector reforms that will allow effective empowerment of the rural communities ensure consistency in government interventions, reduces duplication and limit the government interventions to a minimum. The federal and the State governments will continue to provide policy guidance and have a regulatory role and,

(v) Equity amongst groups and by gender.

2.5 Previous Findings on Socio-economic Characteristics of Beneficiaries of Agricultural and Rural Development Programmes

A study in Ghana by Emmanuel *et al*. (2006), indicated that farmers participating in irrigation project had some type of formal education and not all of them were illiterates. Most of the farmers fall between the ages of 35 and 45 years. A study conducted by Othman (2006) in Kano State, Nigeria on the impact of community based Organizations on rural development indicates that, 92% of the participants were male, while the age ranges between 21 – 30 (26%), 31 – 40 (9%), 40 and above (65%). This means that the findings revealed that in most rural communities there are more elderly people residing in the rural areas because of rural-urban migration of youth. Adekunle *et al*. (2005), in Katsina Project reported that most farmers were males and involved in mixed farming.

They indicated that, farmers that belong to some category of organizations and more participants get hygienic source of water than non-participants. Similarly, the findings revealed that, there is higher output and income for participants than non-participants in the project.

In a study carried out by Amaza *et al*. (2009) on the changes in household food security and poverty status in PROSAB (Promoting Sustainable Agriculture in Borno State) area of Southern Borno State, the mean age by household heads was 45 years, approximately 64% of household heads were in the active and productive age range of less than 50 years. The mean household size in the area of study is approximately 8 persons. About 50% of the respondents had no formal education at all. The majority of household heads in the study area were married. On average, about 87.5% of all household heads in all the project areas were married. Only 12.5% were single. It was also evident that farming was the major occupation of the household heads in the project area with an average of 69% (Amaza *et al*., 2009). Assessing the impact of the Women in Agriculture (WIA) programme of Borno State, it was observed that 52% of the respondents were within the age range of 31 to 40 years and about 90% were married. Some 52% of the women farmers had at least primary education and 34% had farming experience ranging from 16 to 20 years. Average family size of the respondents ranged between 5 and 10 (Sabo, 2006).

Sharma *et al*. (2003) reported in a study of Indian farm households that all were male-headed with an average family size which did not vary significantly across the regions where the study was conducted. Likewise, average age of household heads was above 40 years old, however, average age of commercial farmers was lower compared to other farm size categories, which indicates that younger farmers have strong

preference for production activity. International Fund for Agricultural Development (IFAD) (1999) reported that the poorest segment of the population is characterized by above-average household size, limited labour and no access to fertilizer or credit. They have low crop yields, no marketable surplus and depend on low-income off-farm activities for their economic survival. The relatively less-poor segment of the target group has enough family labour to produce sufficient marketable surplus but remains vulnerable. Oyedele (1991) revealed an increase in hectare of land cultivated that resulted in increased yield in an evaluation of ADP. According to Ridd (1968) lack of credit may be a disincentive to farmer's adoption of agricultural innovations because in some cases farmers are too poor to finance improved agricultural technology. Adeolu and Taiwo (2004) in their study of the impact of the National Fadama Facility in Alleviating Rural Poverty and Enhancing agricultural Development in south – Western Nigeria indicated that the average age of the farmer participants obtained in the survey was about 50 years. This suggests that the participants are ageing without adequate replacement. In their opinion, this may be due to migration of youths and children out of the rural farming communities to the urban centers, and to increased youths/children school enrolment. In the same study, they discovered that there were still more women participants 64% than men. The participation in fadama seems to give the participants secured access to loan as all the respondents agreed to have access to loan facility. They discovered that the mean number of years of experience in farming of participants is 21.8 years. Also, about 80% of the farmers have one level of formal education or another and an average of about three children per farming household are involved actively in farming on their parents fadama plots.

The mode of land tenure of the participants seems basically similar as more than 40% (majority) still hold title to land by inheritance, while rent and leasehold provide the other forms of tenure arrangement. Most (97%) of the respondents have access to ADP extension's training in the use of water pumps, and other irrigation methods. All of them have had contact with extension agents one time or the other while 82.2% claimed to have frequent visit of extension agents. Ina study carried out by Abdullahi (2010) on the Impact of Are-Irrigation Project on Agricultural Production and Livelihoods of people in Rimi Local government area, Katsina State observed the mean age of participants was about 38 years while non-participants was 40 years. It means that participants were younger in age which indicates that younger farmers may have strong preference for production activity, suggesting that respondents were within the agricultural productive age range of 30-55 years (FAO, 1995). This suggests that irrigation farming in the area can be expanded if the available labour potentials are properly harnessed to increase productivity especially with the labour intensive nature of irrigated agriculture. Abdullahi (2010) also indicates that the mean household size for both participants and non-participants was 9 persons per household head respectively. This household size tallied with International Fund for Agricultural Development IFAD (2001) found for the area. It implies that respondents can utilize family labour; hence the larger the size of the household, the more family labour is utilized. Similarly he discovered that the mean farm size of the participants was about 1 hectare and similar farm size for the non-participants respectively. It shows that both participants and non-participants owned small holdings an indication that farmers operate on small scale production. Also, the study revealed that participants had more farming experience with a close range of mean value of about 15 years than non-participants who had about 14 years. The work experience of less than 20 years may be considered low (Sharma *et al*.,

2003). This implies that with more experience, a farmer can become less averse to the risk implied by adopting a new irrigated agricultural technology.

A similar study conducted by Musa (2011) in Kaduna State on the Impact of Fadama II development Project on the Income of benefitted, Marginalized and Vulnerable groups, indicates that the majority (43%) are the unemployed youth. Women and widows accounted for 21% and 28% respectively. The elderly had 4% while the least is the people living with HIV/AIDs with 2.4%. This result corroborates with Chikwendu *et al*. (2005) who noted that rural youths are more disadvantaged socially and economically compared to their urban counterparts. They suffer a number of disadvantages including poor leaders, poor medical facilities, inadequate housing conditions, insufficient and lower standard of education and other infrastructural amenities, limited political exposures, voiceless and lack of initiative and economic support. The same report revealed that majority of sampled respondents examined were within the age bracket of 40 – 49 years (37%). This indicated that the large number of respondents were young, active and more productive. Therefore, given adequate levels of farming resources, they will have the potential to maximize their farm output. Further analysis on the socio-economic variable revealed that majority of the respondents in the study area were male with 62%. The women were involved in processing of farm products and other off-farm activities as well as domestic activities such as taking care of the family and cleaning of the house. In the same study, majority (73%) of the respondents were married while majority (46%) of the sampled respondents have family size of between 1 – 5 people, 69% of respondents had secondary education, 26% had primary education while 5% had tertiary education. The implication according to Musa (2011) is that education would significantly enhance

farmer's ability to make meaningful management decisions, enhance knowledge of improved methods of farming such as use of recommended packages etc. The same study revealed that majority of the respondents (36%) have less than 5 years Fadama farming experience, 19% have 5 – 10 years and above respectively. According to Nkonya *et al*. (2008) years of fadama farming experience of farmers could have a great influence on their participation in fadama II project.

Several authors have shown that relationship exists between the socio-economic characteristics of women farmers and cassava production (Omifare, 1989; Olaniyan, 1998; Okoosi, 1990). Such socio-economic characteristics like age affects agricultural productivity. Ojuekaiye (2001) Stated that the more the years a farmer spent on the farm, the better his understanding of the socio-economic and climatic factors that affect farming. Ekwenta (2004) asserted that young farmers are more enthusiastic and more inclined to adopting new innovation than elderly farmers. He stressed that the elderly people are lukewarm in adopting new practices for the fear of their security or prestige. Children in some communities have been considered to be of economic value. The number of children owned by a farm family determines the extra labour force for farm work. In some societies where labour is expensive or difficult to come by, large number of children is an advantage at the peak labour demand in cassava farming (Omifare, 1989). Education is a dynamic instrument for enhancing women's participation in agricultural production (Ekong, 2003). There is a positive correlation between level of education and efficiency, effectiveness and ability to think about a problem and managerial capacity (Awoyemi, 2000). Agricultural transformation requires basic skills and knowledge on application of new technologies. High illiteracy level among farmers implies that majority of them will be unable to take advantage of full benefit of

improved/recommended production practices. Education exposes farmers to available information in the area of interest, enhancing learning capacity and improves attitude towards change. Several studies carried out in Nigeria reveal that there is a significant positive relationship between formal education and adoption of new farm practices (Osuji, 1983; Ekwenta, 2004).

Similarly, Ojuekaiye (2001) posited that education is an important socio-economic factor that influences farmer's decision because of its influence on farmer's awareness, perception, reception and the adoption of innovation that can bring about increase in production or reduced production. Musa (2011) in her findings posits that education and household size were found to contribute significantly to the respondents' efficiencies for both the beneficiaries and non-beneficiaries. The coefficients for education and household for both beneficiaries and non-beneficiaries were found to be negative and significant at 5% level of probability. The implication is that level of education increases technical efficiency and decreases technical inefficiency of the respondents. It could be noted that with more exposure by the farmers, will help them gain more useful information on better farming techniques and better managerial decisions to be more efficient in farming. Musa (2011) reiterated in the same study that the negative coefficient level of household implies that as household size increases, technical efficiency increases since more hands are being employed, and thereby reducing technical inefficiency.

Credit is a very important factor that is needed to acquire or develop farm enterprise (Ekong, 2003). Its availability could determine the extent of production capacity. This could also influence the disposition of farmers to new ideas or innovations. A large

scale farmer would be expected to adopt a new practice better than the small scale farmers not only because he possesses better and higher financial capacity but also because he would desire to keep his level of production if not been able to increase it (Deji, 2005). Availability of credit facilities is, therefore, very crucial to the adoption of improved practices and new ideas in agriculture. The significance of credit to agricultural production is further manifested in the work of Akande and Igben (1984) who reported that access to credit is the ultimate in agricultural development.

Membership of cooperatives societies has propensity to provision of credit facilities. People come together to pool their resources so as to meet individual needs that could not be resolved by individual limited financial capacity. Ijere (1992) affirmed that people cooperate because they could not achieve their aims alone. Deji (2005) noted that there is a significant relationship between membership of cooperatives societies and the adoption of improved cassava variety in Oyo State. The result of his findings further indicates that the number of children assisting in farm work, sources of credit is positively related to membership of cooperative societies. Jibowo (1980) reported that there is a significant relationship between family labour, total income, access to credit facilities, participation in social organization, use of mass media, cosmopoliteness, knowledge of extension work and methods of acquiring farm land and adoption of improved agricultural practices.

2.6 Impact of Agricultural Development Projects on Crop Output, Income and Livelihood of the People.

Agricultural Development Projects has been shown to improve crop productivity, enable households to grow higher valued crops, lead to higher incomes and wage rates for family labour, deficit the poor and landless through increased food availability and

lower food prices (Hussain and Minnir, 2003). A study by Kudi *et al*. (2008) on analysis of the impact of National Fadama Development Project II (NFDP II) in alleviating poverty among farmers in Giwa. Local Government Area of area of Kaduna State discovered that 10% of the respondents had little improvement in their income, while 43.3% and 47% of the respondents had high and very high improvements in their farm income respectively. The implication is that better income gives better purchasing power and hence the improvements in level of living. Similarly, they found that 2% of the respondents recorded little increase in yield, while 45% and 53% of the respondents recorded high and very high increase in yield respectively.Their result further established a level of success of the programme on farmers' socio-economic life as all respondents (100%) indicated an improvement in living condition. The implication of the higher yield reflected higher income to the farmers and consequently improved level of living. Adeolu and Taiwo (2004) in their study of the impact of the national Fadama Facility in alleviating Rural Poverty and Enhancing Agricultural Development in the South-Western Nigeria found that the farm income obtained from the Fadama fields cultivation increased by about three times from ₦13, 368.00 at the baseline to ₦38,918 .00 in the current season.

An empirical study by Tsefaye*et al.* (2008) on Filtino and Godino irrigation schemes in Ethiopia found that access to small scale irrigation leads to increased and stable production, income and consumption, Manza (2013) in his impact on 'PROSAB' project on food security, farm incomes and rural livelihoods in Southern Bornu, Nigeria discovered that the PROSAB project improved the wellbeing of the beneficiaries. This is because the beneficiaries bought more land for farming, paid children's school fees easily, bought fertilizers and agrochemicals, built/renovated their houses etc. The

adoption of treadle pump irrigation improved the poverty status of households and prevented households from falling into poverty (Mangisoni, 2008).similarly drip irrigation has been proved to increase production of crops, reduced water consumption and environmental problems such as soil salinization and fertilizer run-off (Narayana-moorty, 2004).

Analysis of household data from 13 villages in Northern Mali showed increases in total household consumption, agricultural production, calorie and protein intakes, and savings for households with access to irrigation (Dillon, 2008). In addition to increased production, irrigation reduces the variance of production levels from rainfall shocks. Dillon (2008) further showed evidence of secondary effects of access to irrigation. Access to irrigation increased informal sharing of food between households within villages. In the study of the impact of Are-irrigation Project on Agricultural Production and Livelihoods of people in Rimi Local Government Area, Katsina State. Abdullahi (2010) discovered that the crop output, income and level of living of the beneficiaries improved greatly when compared with the non-beneficiaries.

2.7 Socio-Economic and Institutional Factors Influencing Beneficiaries Participation in the Project.

Ogunbameru and Idrisa, (2013) have identified factors influencing beneficiaries participation in agricultural and rural development project. One of the reasons why famers would adopt most or all the practices passed to them were if the extension staffs to farmer ratio was low therefore, the extension staff were able to follow up the practices taught. Furthermore, Mathews-Njoku*et al*. (2009) stated that adoption and utilization of agricultural technology by rural farmers is largely dependent on the relevance effectiveness of information dissemination and the ability of extension agents

to persuade the farmers. In Greece, farmers' decisions to participate in agricultural projects have been reported by Dimitri and Nicholas (2002), to include agricultural education/training of the farmers, the farmers' economic size, participation by neighbours or relatives and age of farmers. Such socio-economic characteristics like age affect agricultural productivity. Ojuekaiye (2001), stated that the more the years a farmer spent on his farm the better his understanding of the socio-economic and climatic factors that affect farming. Ekwenta (2004), asserts that young farmers are more enthusiastic and more inclined to adopting new innovation than elderly farmers. He stressed that the elderly people are lukewarm in adopting new practices for the fear of their scanty prestige being jeopardized.

Education is a dynamic institution for enhancing farmers' participation in agricultural production (Ekong, 2000). Education exposes farmers to available information in the area of interest, enhancing learning capacity and improves attitude towards change. Ekwenta, (2004) revealed that there is significant positive relationship between formal education and adoption of new farm practices. Emmanuel, (2004), also stated that low level of education of small scale farmers especially women who constitute the bulk of agricultural labour force has remained a major constraint to the adoption of modern farm practices, inability to access other inputs necessary for increased productivity in the sector. Education affects agricultural productivity by increasing the ability of farmers to produce more output from given resources (Ogunbameru, 2001). Earlier, Idrisa et.al (2010), found that education was positive and significant influencing the adoption of improved soybean seed among farmers in Borno state, Nigeria.

Ogunbameru and Idrisa (2013) had reported that there is no general reluctance to adopt new technologies when they are suitable in terms of investment, economic feasibility,

adaptability and meet the farming systems of the farmers. Okoosi (1990), in his study of adoption of agricultural innovations reported increased adoption of fertilizers because the application of fertilizer to plant is easier and can be managed by the rural farmers themselves with the minimum training from extension agents. However Oladele and Kareem (2003) reported that the use of fertiliser was the least sustained technology under cassava production due to high cost of purchase. Similarly, Ojuekaiye (2001), revealed that lack of fertilizer and its high prices were responsible for reduction in cassava production through reduced hectares. In general, Musa (2004), observed that uneven supply of farm inputs, poor infrastructure, poor transport systems and other support services are among the factors influencing farmers to participate in project activities.

Credit is a very important factor that is needed to acquire or develop farm enterprise.(Ekong, 2000), its availability could determine the extent of production capability. Availability of credit facilities is therefore, crucial to the adoption of unproven practices and new ideas in agriculture and ultimately in agricultural development. Land, on the other whether it is inherited, purchased gifted, leased and so on, is a basic resource of agricultural production.

2.8 Empirical Findings on Factors Influencing Beneficiaries Crop Output.

The use of modern farming technologies such as improved seed enhance crop yield and income of farmers. Generally (Bamire, *et al*. 2002; Ouma, *et al* 2006; Onu, 2006) in their study of soybean and income from soybean in Borno state, Nigeria revealed that majority (67.50%) of the respondents had 1000kg or less of soybean during the study period. About one-quarter (23.89%) of the respondents had from 1001kg to 2000kg;

05.83% of them had between 2001kg and 3000kg while a dismal 2.7% had more than 3000kg of soybean during the study period. This depicts that the yield of soybeans increased during the study period, about the same population (92.22%) also operated at small scale level (≤ 1ha). Similarly, when the physical output was converted into its monetary value, it was found that majority of the respondents got up to ₦400,000.00k from the sale of soybeans, while an additional 29.72% got up to ₦1,200,000.00k from the sale of soybeans. Each 100kg bag of soybean sells for ₦40, 000.00k. Mean income from sale of soybean among the respondents was ₦380, 000.00k which is equivalent to $2, 420.38. The World Bank (2007) also reported that Ghana reduced rural poverty by 24% between 1990 and 2005, principally as a result of empowering small-scale farmers through adoption of improved technologies.

Nigeria is one of the world's largest producers of cassava with about 37 million tonnes of cassava cultivated on 2.5 hectares of land, with a natural average field of 14.8 metric tonnes per hectare (Olumide, 2003). However, a total output production of 38.17 million metric tonnes was reported to be harvested from 4.118 hectares of land with average yield of 9.271 tonnes per hectare (FAO, STAT, 2005). Nigeria's production accounts for 19% of the world output and 34% of Africa output (Agwu and Anyaeche 2007).

Research in Nigeria by International Institute of Tropical Agriculture (IITA) Ibadan and National Root Crop Research Institute (NRCRI) Umudike over the years have made cassava a priority for extensive research and have developed different varieties that are resistant to major diseases. These varieties give sustained yield of over 50% higher yield when compared to local varieties (Yahaya, 2007). The persistent problem of food shortage in Nigeria has led to increasing productivity, which involves the use of

improved high yielding crop varieties have been popularized among farmers through extension services of ADPs (Afolami and Falusi 2000). The multiplication, distribution and adoption of TMS varieties by farmers have led to tremendous yields increase over the years (Dipeolu*et al*. 2000). Daniel (1997), reported that there was double farm output increases largely from output irrigated farms. Musa (2004) also noted that irrigated agriculture contributed significantly to increased output as well as improved living conditions in the beneficiary farmers. It was also considered that high level of adoption by farmers of research proven technology were capable of increasing farmers income meeting their required daily food needs and promote general economic growth (Abdullahi, 2010). Abdullahi (2010) also reported that there was significant difference in crop output, income and level of living from irrigated farming between the participants and non-participants. He therefore concluded that there was significant relationship between the extension services provided by the Are-irrigation project and the impact of the project on crop output, income from irrigated farming and standards of living of the participants.

Adijah*et al*. (2010) reported that adoption of improved agricultural practices by farmers significantly increased the variance in maize yield, with the farmers who top-dressed their maize realizing the highest yields. In addition most of the respondents reported that adoption of improved maize practices resulted in increased production and that small scale farmers were able to adopt these practices because they were easy to adopt. The study further concluded that farmers from Lugari district realised high maize yields in western province as compared to other study districts. The reasons for high maize yield could be because most farmers from Lugari District in Kenya had attained secondary school education and above and therefore were able to understand and adopt the

improved agricultural practices passed by the extension staff and had farming as their sole employment and where not involved in other forms of employment. And also adopted all the improved agricultural practices passed by the extension staff.

2.9 Empirical Findings on Level of Adoptionof Improved Practices

The choice of a good variety of crop grown in a particular locality is a prerequisite to achieving higher productivity(National Agricultural Questions and Answer Services Newsletter, 2002).one way of transforming agriculture is by exposing small-scale farmers to improved agricultural production technologies such as high yielding seed varieties. According to David and David (2000) technological change has been a major factor shaping agriculture in the recent past. For instance, a comparison of agricultural production pattern in the united states in 1920 and 1995 shows that harvested cropland has declined (from 350-320million acres)the number of people employed in agriculture has declined (from 9.5million in 1920 to 3.3millionin 1995). Yet agricultural production in 1995 was 330% greater than its figure in 1920. This suggests that agricultural productivity has increased. The main explanation for such increase is change in agricultural production methods, chief among which is the use of improved high yielding seed varieties. The International Institute of Tropical Agriculture (IITA) has championed the cause in developing improved agricultural technologies for possible adoption by farmers in Africa. One of such technologies developed and delivered to farmers is the improved soybean seeds. According to Ogunbameru *et al*. (2013), majority (96.93%) of the respondents have adopted improved soybean seed as production technology in the study area having devoted at least 10% of their total land area to soybean production. However, the mean adoption among the farmers in the study area was 39.34%. This indicates that soybean had high level of acceptability among the small-scale farmers in the study area, being that on the average, every

respondent has devoted 39.34% of his total land to improved soybean seed. Ojiako (2007) opined that a farmer that devoted at least 10% of his total land to improved seed production is considers as an adopter for that technology. The level of agricultural productivity is determined by the extent of use of improved agricultural production technologies (Daramola, 1988). According to Busai*et al*. (2015) majority (80.00%) of the arable crop farmers applied chemical fertilizers, about 08.00% used pesticides on their farms, while 06.50% and 04.50% planted improved seeds and used herbicides on their farms respectively. They also revealed that there was significant difference between male and female arable farmers' adoption scores. This was because F observed (76.4) was greater than tabular F-values (3.92) at P= 0.05. Similarly, the mean adoption score for male and female arable crop farmers were 1.09 and 0.50 respectively. This supports the position that male farmers receive more information, training and technology than their female counterparts (World Bank, 2007). Nevertheless, the same study revealed that there was a negative and significant relationship between arable crop farmers' age and their adoption score. It can therefore be implied that the younger the arable crop farmer the higher their level of adoption of improved farming practices.

In a study of adoption of improved maize production among small-scale farmers in Western province of Kenya, Adijah*et al. (2010).* discovered that adoption of improved agricultural practices by farmers significantly influenced the variance in maize yield with the farmers who top dressed their maize realising the highest yields. In addition, most of the respondents reported that adoption of improved maize practices resulted in increased production and that small-scale farmers were able to adopt these practices because they were easy to adopt.

Komolafe*et al*. (2014) in their study of determinants of adoption of improved crop practices among women farmers in Ekiti East Local Government Area of Ekiti state, Nigeria discovered that all (100%) of respondents were aware of improved crop varieties but only 42.6% utilized the practice. Appropriate spacing of crop varieties were known among majority (76.5%) but few (17.4%) adopted the practice. Most (79.1%) were also aware of appropriate planting date but only 9.6% utilized the practices. All (100%) were aware of fertilizer application but few (12.1%) adopted the practices. Other practices such as weeding interval, agrochemical application, tillage practices, soil conservation practices and improved processing techniques of crops were knownby majority but only few 6.9% adopted weeding interval, 4.4% adopted tillage practices, no respondents adopted soil conservation practices. However, improved practices adopted by majority were; agrochemical application (71.3%) and improved processing techniques of crops (82.6%). Consequently, the same study x-rayed the perceived determinants of adoption of improved technologies among women revealed that the male-family headship and decision making were indicated to be major factors by majority (68.00%). About 25.2% indicated family headship to be a minor problem while (6.1%) indicated family headship not determinant. Windapo (2002)had noted that economic and household characteristics of farmers affect their response to innovations.

Improved cassava varieties have been adopted all over Nigeria. Nweke *et al*. (1988) observed that 80% of cassava land was planted with improved varieties in 1987. In the sub-humid zone of the South East, Nigeria, Ezedinma (1989) estimated that 29% of cassava land was planted with improved cassava varieties. According to Akoroda*et al*. (1989) 59% of the farmers in Oyo state, South West, Nigeria, within the humid zone planted the improved cassava variety of International Institute of Tropical Agriculture in

63% of their cassava land area while about 40% of the land was allocated to improved variety in the non-humid zones.Okunade (2006) in his study, revealed that 100% of the farmers adopted improved cassava production techniques, while another study by Oladele and Kareem, (2003) revealed that farmers' beliefs and preferences influenced the adoption of agricultural innovation.

2.10 Constraints Encountered by Farmers in Agricultural and Rural Development Projects

Research findings on the constraints to the effective performance of agricultural and rural development project revealed that, most past policies, strategies and interventions failed to achieve their objectives as a result of poor design (Tomori*et al*., 2005). In Nigeria, most of those policies were not successful due to "top-down" policy in which development are forced on people regardless of their felt needs (Ijere, 1992). Other factors that militate against project implementation (Wallace, 1979) included lack of understanding of the socio-economic, socio-cultural and religious factors of the beneficiaries communities. Arokoyo (1995); Kabre and Zabo (2001) opined that lack of understanding of the socio-economic and socio-cultural elements of the communities or participants by the programme implementers and also lack of appropriate institutional framework and linkages between the government's agencies and research institutes charged with such responsibilities are a source of constraint. Morardet*et al*. (2005) identified inappropriate technology as hindrance in the transfer of many technologies to farmers practicing irrigation. These factors according to them are land possession, village-family structure, income etc were the most important. Omokore (2008) also reported policy in consistency, lack of political support, shifts in approaches by successive governments, lack of effective institutional arrangements for implementation and lack of qualified manpower to provide effective leadership were identified as the

major impediments. More so, lack of education among women, linkages with NGOs, problem of leadership, politics, funding, awareness on the activities, capacity building and training were among the constraints that limits the impact of community based organizations and rural development (Othman, 2006).

Abdullahi (2010) in his study of impact identified poor processing and storage facilities, inadequate capital, poor market price of produce, limited literacy, high cost of farm inputs, inefficiency of pump machines, late commencement of irrigation activity, delay in the distribution of subsidized inputs, sub-standard chemicals and disease and weed infestation as the major constraints. In a similar study, Igonoh (2011) opined that low level of education and training, untimely disbursement of funds, untimely distribution/high cost of inputs, hijack of inputs and funds by the elites, delay in association contribution, poor storage facilities, poor marketing system and weak extension contact were discovered to be the major impediments. Kudi *et al*. (2008) in their study also observed that insufficient inputs, time wasting in processing/high cost of maintenance of irrigation facilities, inadequate land for farming and others were constraints on the implementation of Fadama II Project in Kaduna State.

According to Aliyu - Auchan (1977) and Akanya (1989) the indicators of the impact of an intervention include: change in knowledge and attitude, mediating behavioural outcome, change in individual behavior towards programmes and result of indices of economic and general well being of the recipients. Daramola (1988) in his study of the impact of the various elements of a recommended farm practices found that supply, ignorance and poor level of farmers education were responsible for farmers not adopting the recommended agronomic practices. Atala (1988) was of the opinion that adoption

behavior of farmers was a function of their inability much more than their unwillingness to accept improved farm technologies. According to him, the major factors limiting the use of recommended farm practices were inadequate extension contact, inadequacy of input supply and lack of credit. However, the various dimensions for assessing impact include rate of adoption of recommended farm practices, farm output and income of the farmers. For the purpose of this study, the researcher will adopt the beneficiaries and non-beneficiaries impact strategies.

CHAPTER THREE

THEORITICAL AND CONCEPTUAL FRAMEWORK

3.1 The Concept of Theory

Theory is a set of abstract and logical compositions which attempts to explain relationships between phenomena based on untested assumptions about realities. Social theories serve as general principles put forward to represent facts and events of social reality in the society. Theory construction in social sciences has several objectives namely: it provides conceptual framework to facilitate the accurate observation and reliable description of social event, it formulates laws and theories by which social phenomenon can be explained. It establishes a foundation of knowledge and methodology that under certain conditions make possible the control of social affairs (Shrag, 1967).The framework that will guide this study are theories of modernization,social change, adoption and diffusion, and impact assessment concepts.

3.2 The Modernization Theory

The theory of modernization states that all human societies are undergoing a parallel series of transformation from pre-industrial to industrial societies. According to Moore (1963) the concept of modernization denotes a total transformation of a traditional or pre-modern society into the types of technology and associated social organization that characterizes the advanced, economically prosperous, and relatively politically stable nations of the western world. Such a view is predicated on the assumption that one can describe the general features of both traditional and advanced or modern societies and thus treat development as the transformation of the one type into the other. Long (1977) explained that economic development takes place through;

(i) The modernization of technology, leading to a change from simple traditionalized techniques to the application of scientific knowledge;

(ii) The move from subsistence to commercial farming, leading to a wage labour;

(iii) The industrialization process, which depicts the transition from the use of human and animal power to machine power and

(iv) Urbanization, which consists of changes in the ecological dimension and is the movement from farm and village towards the growth of large urban centers.

These processes, he suggests, sometimes occur simultaneously and sometimes at different rates. For example, in many colonial situations agriculture became commercialized without industrialization or as in the Guatemalan case industrialization developed with little urbanization.

3.2.1 Application of the theory

The modernization theory is the theoretical assumption underlying the planning and execution of change programmes in most developing countries. This approach focuses on the premise that change will occur when there are changes in technology, level of capital investment and market demand. The approach further stressed that to achieve the goals of change programmes such as modernizing agriculture, close attention must be paid to the attributes of the innovations and socio-economic characteristics of the clients (farmers).In this approach, emphasis is on changes that could lead to increase production in agriculture. However, modernization of agriculture could create an unbalanced national development and affect welfare of the people as exemplified by Green Revolution in Asia, Latin America and some parts of Africa. In these instances,

adoption of modernization strategy in agricultural production was based on the assumption that the programme designed to increase agricultural production must resolve the problem of welfare or social equity and increase agricultural production through some trickle-down effect (Ega,1988).

This study goes beyond the modernization approach and takes into consideration the historical context of development. Development according to Ladele (2005) is a continuous process of generating and efficiently allocating resources for achieving great socially satisfying needs. Furthermore, he asserts that development essentially comprises of two interrelated components which are increasing the available resources in a country and improving the utility of these resources. In principle, national development is normally not left to chance, but marshaled through concerted and planned efforts guided by policies, plans and strategies. With the structure of national development, the special attention being paid to agricultural development evolved from early thoughts on the role of agriculture in industrialization. Famoriyo (1979) viewed agricultural development as a conscious and systematic attempt to utilize the agricultural resources of a nation in order to benefit agricultural workers and farmers in particular and the entire population in general. Furthermore, he opines that the definition of this concept implies that agricultural development is neither a revolutionary nor an evolutionary process rather, it is a planned process; a process of marshalling all the human, physical and financial resources of the community in order to attain certain given objectives with minimum costs and in the shortest time possible. Thus, the over-all aim of any change programme particularly that of agricultural modernization is to intensify and expand food production most especially crop production which will lead to important and visible change in rural livelihoods of the rural dwellers.

Community Based Agriculture and Rural Development is a development strategy to arrest the social-economic and production crisis inherent in rural areas. It is a technological advancement which derives its theoretical justification in modernization theory. According to Schultz (1971) growth in productivity cannot be brought about by re-allocation of resources in traditional agricultural system through available changes in technology. It is expected that impact of this technological intervention could be realized through effectivefarmers' participation in the project activities which will result in an increased productivity and create opportunities.

3.3 Social Change

Social change according to Chitambar (1973) occurred in all societies, slow, perhaps, in primitive and folk societies and rapid in complex modern societies. Gradual and slow, or rapid and spectacular, social change occur irrespective of the type or location of human society in the world, for change in society is inevitable. Social change is the difference between the old happening in the society and what is currently happening. Chitambar (1973) defined social change as involving a change in the structure or function of societal forms, social interaction involving social processes in society taking place in accordance with existing norms and values in organizations, institutions and other societal forms without alteration in these societal forms and within their framework. Similarly social change, however, involves alteration in the structure and functioning of these forms.

Moore (1963) conceptualized social change to mean the transformation of traditional societies into types of technology and associated organization that characterized the advanced economically prosperous and relatively politically stable

nations. Social change can be viewed as a change in the physical and social structures of a society. Moore (1963) defined social change as a significant alteration of social structures (patterns of social actions and interactions), including consequences and manifestations of such structures embodied in norms, values, cultural products and symbols.

The concept of social change may be summarized under three mains headings; economic, political and cultural. Marx is perhaps the most famous proponent of the notion that societies forms of social organization are largely determined by economic factors and in particular the impact of industrial capitalism. Among political influences the State-government now plays a very large role in social life and change in industrial societies. Cultural influences clearly play an important part in social change for example, secularization and the development of science have had major effects on the way in which we think, attitudes to legitimacy and authority, and have thus also influenced social structures, systems and values (Giddens and Duneiar, 2000).

3.3.1 The application of the theory

Long (1977) opined that an account of sociological and anthropological perspectives on development would not be complete without some discussion of planned change, for an understanding of the patterns of development and change necessarily involves understanding something about the types of approach used by governments and their agencies for initiating economic development and social change. Furthermore, this is especially the case with Third World countries where governments often play a dominant part in attempting to re-structure society in conformity with particular politico-economic goals. Moreover, while social and economic planning is also

important in advanced industrial countries, in the less developed areas of the world, there is often greater concern for centralized State planning which is frequently backed by heavy inputs of foreign aid and assistance (Long, 1977). Social change according to Ekong (2003) can be spontaneous, induced or directed. It may be endogenous or exogenous. In this case, social change denotes the planned change – The Community based agricultural and Rural Development Project (CBARDP) is an intervention programme aimed at improving the socio-economic status of the target farmers. In this study, impact implies outcome of the social change (intervention) programme on the target population, their livelihoods, resulting from participation in the project.

3.4 The Diffusion and Adoption Theory

Rogers (1995) defined diffusion as the process by which an innovation is communicated through certain channels over time, among the members of a social system. According to him, a number of factors interact to influence the diffusion of innovations. These factors are:

(i) The innovation itself;

(ii) Communication channels;

(iii)Time; and

(iv)The nature of the social system into which the innovation is being introduced.

Diffusion according to Daniel (1997) is the process by which an innovation is adopted by members of a community. David and David (2000) in their view said diffusion could be interpreted as aggregate adoption. Their study revealed that there is often a significant interval between the time an innovation is developed, when it is available in the market and the time it is widely used. Adekoya and Tologbonse (2005)

Stated that the process of diffusion is a precursor to adoption, although this does not necessarily always end in the latter. They further reported that diffusion begins with actual entry of an innovation toa target system. Similarly Carr, (2007) referred to diffusion as the stage in which a technology spreads to general use of an application. However, David and David (2000), reported adoption and diffusion are processes governing the utilization of innovation.

Adoption is regarded as a decision to make full use of an innovation or technology (Rogers, 1995). According to Van Der ban and Hawkins, (1996) an innovation is an idea, method, object or practice, which is regarded as new by individuals but which may not always be the result of recent research. Similarly innovation and technology are to be taken as synonyms. Adoption can be defined as the acceptance, incorporation and continues use of agricultural innovation. The decision to accept or reject an innovation emerges gradually after several mental stages or steps have been undertaken. This process of mental stages during which an idea or practice is changed is referred to as adoption. Adoption is therefore the conscious or unconscious mental process through which an individual passes from first knowledge of an innovation to a decision to accept or reject the knowledge. Ewuola (1985), notes that adoption is synonymous to transfer of technology. He defines transfer of technology as that which embraces all efforts to make sure that the farmers adopt new technology. Lavidge and Steiner (1972) developed the "Hierarchy and effects" model comprising awareness, knowledge, liking, preference, conviction and action (purchase or adoption).

The most popular paradigm was the five step innovation decision model designed by Rogers (1983); awareness, interest, evaluation, trial and adoption. Before any

technology is adopted, it must pass through a process of adoption, which involves awareness stage (when an individual's first heard about improved practice/innovation); the interest stage (an individual start having interest in the new practice, hence gathering more information about it); evaluation stage (an individual start judging the value of the new practice); trial (he put such improved practice on practical judgment, normally on a small scale) and adoption stage (an individual decide to continue the full use of the new practice (Rogers and Shoemaker, 1971). The process of making a decision is not an instaneous one but rather occurs over a period of time and does not always follow the sequence in practice (Van Dar Ban and Hawkins, 1996). Corroborating, Onuoha and Nnadi (1999) opined that the adoption of an innovation is not a sudden event. Usually there is a time lag between the time the farmer hears of the new idea and the time he finally decides to adopt or reject.

The willingness to accept new ideas becomes the criteria for classifying members of a social system or the basis of innovation adoption categories. Innovativeness is the degree to which an individual adopts new ideas faster than the other members of his system. It is a psychological trait. Farmers are categorized based on the possession of more or less of that trait. The adopter category is the classification of the members of a social system on the basis of innovation. The various categories of adopters are: innovators, early adopters, early majority, late majority and laggards (Rogers, 1983). Individuals in a social system do not adopt innovation at the same time. Rather, they accept innovations in an ordered time sequence. The adoption period is the length of time required for an individual to pass through the adoption process from awareness to adoption, measured in days, months or years.

Abalu*et al*. (1979) reports that when farmers find recommended farm innovations not to be technically feasible, economically viable and culturally compatible, they often reject such innovation. When innovations are inappropriate or unrelated to their needs and problems, farmers also reject (Mokonnem, 1991). It should be noted that all innovations have characteristics as perceived by their potential users which further affect their rate of usages. Innovations must be compatible to the existing system, must be accessible, divisible, observable and simple to gain popularity among users. The next element of diffusion is time. The spread of an innovation is also characterized by time factor. It is not all individuals in a social system that adopts an innovation at the same time. It takes a process to get members of social system to adopt an innovation. For an innovation to be adopted there must be dependable source of input supply. That is, agricultural organization must ensure regular supply of agricultural inputs. For the farmer to be able to effectively translate the innovation information into action, credit is needed. Agricultural credit determines the impact of agricultural development activities. Credit is described as a vehicle for rural development. It is a general consensus among scholars that due to low level of earning among farmers in most developing countries, the propensity to save is low. Credit therefore, must be made available to farmer to facilitate access to inputs.

3.4.1 The application of the theory

The relevance of change efforts is measured by the amount of transformation witnessed in a social system. Such facets like crop output, income and level of living of farmers are important. Atsu (1974) defined crop output as the total output of crops grown by a farmer over a period of time. The ability of a farmer to improve his output may be a function of his mental being, skill and exposure to extension agent, access to

credit facility and input supply. There is also relationship between, output, income, socio-economic and institutional factors.

Level of living on the other hand is defined as all things contributing to the quality of human existence (Smith, 1977). Atala (1980) expressed level of living as the material and impersonal resources which individuals possess and use to meet his physical, psychological, social and economic condition or needs. An increase in farm income is a measure of an increasing level of living; material possession is also used as a measure of increasing level of living. Farming is the main source of living for farming families.

The study goes beyond the social change approach and takes into consideration the historical context of development. It examines personal as well as institutional factors such as agricultural credit, extension contact, and access to improved planting materials, use of fertilizer, herbicides and seed dressing among others. Also the impact of agricultural and community development project on adoption of new farming technologies, output, income and level of living will be examined in a general context. The multi-dimensional aspect of development will be taken into consideration. For the purpose of this study, crop output, yield, income and level of living were used to measure the impact of the Community Based Agricultural and Rural Development Project.

3.5 The Concept of Impact

The terms impact, assessment or evaluation are used in many different ways by different people. Impact refers to the broad, long-term economic, social and environmental effects resulting from research while evaluation/assessment is judging,

appraising or determining the worth, value or quality of research, in terms of its relevance, effectiveness, efficiency and impact. It refers to the broad, long term socio-economic and environmental effect of the programme on the beneficiaries and the general eco-system (IAEG, 1999). Impact of a programme can be manifested in relation to weather the services actually resulted positively on the people who receive them. Impact studies are of paramount importance in agricultural programmes as it shows the benefits derived by the participants as a result of their involvement in the programme as well as show their preferences to the programme. Impact studies are an established practice in public goods investment project and programmes such as infrastructure, health, education, transportation, urban and rural development.

There are many impact studies that have been carried out in Nigeria. Many of such studies used the activities carried out by extension organizations or projects as their criteria for assessing the impact of such projects on the target population (rural farmers). The aim of any agricultural and community development project is to raise the productivity and income of the farmers. There is therefore, the need to look at the immediate outcomes, which include awareness and adoption of farm technologies. Impact is generally concerned with the outcome, most studies done in the country are under the premises that certain social, economic, cultural and environmental factors are the ones affecting the decision to adopt new practices (Atala, 1980).

Impact of social intervention can be seen as an output of the organization which is related to the achievement of the programme objectives. Jibowo*et al*. (1979) and Gaijart (1968) in an empirical study which they carried out independently used socio-economic status, education, farm urban residence and contact with extension workers to

assess the impact of projects like Isoya Rural Development Project. Impact can be defined more broadly than goal attainment as long term influence on the State of the environment surrounding an organization (Kanter*et al*., 1981). More so it is important that programme evaluation should devote more time to the efficiency with which goals are achieved and the impact programmes have on the environment determines the organizations' confidence and credibility. Brumback*et al*. (1978) saw impact as synonymous with end result. It is interchangeably used as outcomes or results. Subjective measures of impact are used in the study of extension organization in analyzing the perception of client regarding given services. According to Katz *et al*. (1975) perception of impact study is one means of demonstrating the quality of service provided by the organization. Such perceptions are designed to provide an organization with feedback from the relevant public the organization is serving the objective of any extension organization is to increase production and enhance income of the farmers. It is, therefore, imperative to look at the immediate end result of the efforts of the extension organization. Measure of client satisfaction was proposed as means of establishing focus on impact. A model of effectiveness based entirely on client satisfaction was first used by Katz *et al*. (1975), in their study of government services. It must be mentioned, however, that the role played by extension services is conditioned and influenced by relevant factors which to a greater extent determines effectiveness. Ladewig (1983) asserted that if efforts to measure impact of extension organization are to provide any meaningful results they must be based on multi-dimensional framework. The framework should reflect the major activities involved in carrying out the extension mission.

Reynolds (1970) suggested that the impact of an organization could be determined by these indicators, namely:

(i) Change in attitudes and knowledge

(ii) Information seeking behavior of the client system

(iii) Changes in individual behavior towards the activities of the organization

(iv) The resulting outcome of the organizations programme on the target populations, that is, the indices of economic or general well-being of the target group.

Whether the goals of an organization are being achieved or not depends on the attributes of the innovations, the socio-economic characteristics of the clients (Rogers and Shoemakers, 1971). It is also observed that although clients participate in the activities of an organization at their discretion, there is need to consider other factors like support agencies in determining success or failure of an organization. Jibowo*et al*. (1979) in an empirical study used an approach involving the participants and agents, programme activities and the environment and the characteristics of all involved to assess the impact of Isoya Rural Development Project. Therefore, in assessing the impact of agricultural extension programmes on farmers agricultural behavior is a function of several variables covering socio-economic characteristics of the farmers would affect their request, utilization of services from an extension organization.

3.5.1 Application of the theory

According to Alene *et al*. (2006) impact assessment of agricultural research is viewed as an important activity to ensure accountability, maintain credibility and

improve internal decision making processes and the capability to learn from the past experience. Impact study is seen as a critical component of agricultural research that helps to define priorities of research and facilitate resource allocation among programmes, guide researchers and those involved in technology transfer to have a better understanding of the way new technologies are assimilated and diffused into farming communities, and show evidence that clients benefit from the research products (Manyong *et al*. 2001).

Impact studies is of great importance in agricultural research because it is used to identify alternative technologies that would address the major production constraints while at the same time taking into consideration farmers preferences and farming condition, (Alene, *et al*, 2006). However, in using impact study as accountability exercises to justify past programmes activities, impacts should be evaluated in terms of all the goals and objectives that were set when the project activity or programme was established (IAEG, 1999). Impact studies improve targeting of research projects and help adjust resource allocation across projects. It is needed to measure benefits and compare them with the costs of the research. Impact studies are measured because resources are scarce, there is the need to justify every investment in agriculture and also documentation of research on impact will enlist support for more and sustained funding. Musa (2011) Stated that with careful evaluation of research impact, scientists can target their work to achieve the greatest possible pay offs. The broad goals of impact studies are; a way to account for past funding; basis for attracting new funding, creates awareness on the importance of agricultural research, it is also a means of securing political support for agricultural research and it provide feedback for assessing agricultural growth and development objectives.

Chikwendu (2005) posited that impact assessment helps to document accountability for past funding, build a tract record to attract new funding, and also guide research agenda to achieve national priorities. It is therefore, important to evaluate impact in terms of all the goals and objectives that were set when the programme was established. IAEG, (1999) reported that in order to establish whether the programme has impacted on the livelihood of the beneficiaries therefore, assessment of all the goals and objectives should be carried out. Manyong*et al.* (2001) in their view argued that impact assessment of agricultural research is a continuous process and being a process is better conceptualized as a cycle involving different types of impact studies at different stages using beneficiaries and non-beneficiaries impact assessment approach. These researchers further stressed that impact studies essentially have the same process as technology development and based on the technology development process, four stages of impact assessment constitute the impact cycle. These include impact for priority setting (ex acute impact), on-farm technology evaluation, adoption, ex-post impact. According to Atala (1988) the indicators of the impact of an intervention include: change in knowledge and attitude, mediating behavioural outcome, change in individual behavior towards programmes and result of indices of economic and general well being of the recipients. Daramola (1988) in his study of the impact of the various elements of a recommended farm practices found that supply, ignorance and poor level of farmer's education were responsible for farmers not adopting the recommended agronomic practices. Atala (1988) was of the opinion that adoption behavior of farmers was a function of their inability much more than their unwillingness to accept improved farm technologies. According to him, the major factors limiting the use of recommended

farm practices were inadequate extension contact, inadequacy of input supply and lack of credit.

3.6 The Concept of Community-Based Agricultural and Rural Development Programme

The approaches to community development in Nigeria according to Ekong (2003) can on the other hand, be discussed at two levels: the governmental and the local people's levels. At the governmental level, community development in Nigeria is handled through a `multi-purpose approach'. This involves an attempt at developing the rural areas by co-coordinating the extension services of the various executive ministries and integrating the peoples' organized self-help and co-operative actions with the specialized services of the government and other voluntary agencies. More specifically, at the people's level, community development in Nigeria is tackled through the `inner resources or self-help approach'. This is a case where the people themselves through discussions, stimulation through demonstration, and internal enlightened leadership, identify their needs and mobilize their own resources to meet such needs. Community development in the other words can be seen as an "umbrella organization" within which a variety of local level programmes could be housed.

From these and other definitions of the term, it is obvious that community develop0ment emphasizes the following – community self-help, attention to community's felt needs, the development of community as an integrated whole and technical assistance. More specifically, the concept of community development according to Ekong (2003) assumed that:

(i) the local community has been overshadowed by the larger society as a result of long isolation, colonial domination (external and internal) and the consequent decline in community spirit,

(ii) the local people are poor owing to an underdevelopment of both the available resources in their environment, and their own individual potentialities,

(iii) people everywhere want better conditions of living and a richer economy and can develop the capacity to improve these things by themselves,

(iv) many problems be setting rural populations can be solved at the community level with local community resources and with outside intervention limited to education and technical aid,

(v) participation of people in decision on major changes taking place in their communities is desirable and functional; and

(vi) Local people do not see their problems in isolated packages but as a complex whole, hence community development must be multi-purpose in nature touching upon all aspects of community life.

Development intervention or the resources and technology needed for transformation of a social system or socio-economic well-being of members of the system may come from within or outside the community. Based on the fact that community development as a concept is broad based and multifaceted, Smith (2006) submits that a developed community should reflect or fulfill the following:

(i) ensures order and security of life and property through the medium of an efficient government ,

(ii) strengthen the economic well-being or income security of the people through an efficient system of productive industry,

(iii) enhance the physical well-being or health and sanitation of the community through public health agencies,

(iv) motivate constructive use of leisure time, or recreation through public health agencies,

(v) establish ethical standards, or a system of morality supported by the organized community,

(vi) stimulate intellectual diffusion, or education through free and public institutions within the reach of all,

(vii) create free avenues of expression, or means by which all the elements of the community might freely express themselves; free newspapers and public forms, and

(viii) Entrench democratic forms of organization, or community-wide organization through which the entire community might express its thought and see to it that it's will is done.

Community Based Rural Development Work Plan noted that the basic objectives of the project are to improve the livelihood of the poor households through interventions aimed at increasing and sustaining productivity in agriculture and in small rural enterprises and to arrest and reverse environmental degradation. Community participation is the key to this process through motivating individual farmers and mobilizing village communities. To this end, critical mass of concentrated project interventions is required to create sufficient impact to ensure acceptance, replication and

sustainability. CBARD Project is expected to focus on individual village areas with the sustained involvement of the villagers and with the full support of the traditional authorities who remain powerful and respected.

3.7 The Concept of Rural Development

Development essentially is a continuous process of generating and efficiently allocating resources for achieving greater socially satisfying needs (Ladele, 2005). This essentially comprises of two interrelated components: increasing the available resources in a country and improving the utility of these resources. In principle, national development is normally not left to chance; but marshaled through concerted and planned efforts guided by policies, plans and strategies. There are many different views about what constitutes development. Some according to Van dan Ban and Hawkins (1996) think it is an increase in the average per capita income, on the assumption that people will then be better off. Few people now accept this view because, although average incomes have risen on many countries, the differences between rich and poor have widened and a large part of the population is even worse off. More attention is now given to improving the quality of life, using indicators such as health, education and housing. Many poor people in the less industrialized countries like Nigeria have little influence on their situation, a condition that leads to apathy.

Rural area, whether in developed or developing countries of the world is of great significance in view of the fact that the area is richly endowed with abundant human and natural resources. Ekong (2003) asserted that in Nigeria, the importance of the rural areas also lies in the fact that over 80 % of the people live and derive their livelihood in the rural areas. Ekong (2003) defined rural development as a process by which a set of

technical, social, cultural and institutional measures are implemented with and for the inhabitants of rural areas with the aim of improving their socio-economic conditions in order to achieve harmony and balance both on the regional and national levels.

Similarly, but in more encompassing terms, Coombs and Ahmed (1974) defined rural development as the far-reaching transformation of the social and economic structures, institutions, relationships and processes in any rural areas. It conceives the goals as not simply as agricultural and economic growth in the narrow sense but as well as balanced social and economic development, with emphasis on the equitable distribution as well as the creation of benefits. Among the goals are equitable access to arable land, more equitable distribution of income, widespread empowerment in health, nutrition and housing, greatly broadened opportunities for all individuals to realize their full potentials through education and a strong voice for all rural people in shaping the decisions and actions that affect their lives. Jibowo (2000) defined rural development as involving the transformation of the rural community into a socially, economically, politically, educationally, orderly and materially desirable condition, with the purpose of improving the quality of life of the rural population. Rural development can be seen in terms of uniform distribution of national resources. It is a comprehensive mode of social transformation which recognizes that national development must involve all parts of the population. It can further be seen as socio-economic process which seeks to bring a more equitable distribution of resources and income within a society, it therefore involves the integration of the rural poor, which constitutes the vast majority of the population of most developing countries into the national economy.

In many developing countries, agriculture constitutes the occupation of a vast majority of people. Agricultural development therefore is an important aspect of rural development. Many industries also utilize agricultural raw materials. Examples are the textile industries which use cotton, canning industries which use fruits and vegetables, beverage industries which utilize cocoa, coffee and tea, sugar industries use sugarcanes, vegetable oil industries use vegetables, and animal products industries such as dairy, cheese, butter, broiler, leather industries which utilize various parts of animals. Rural industrialization is therefore an important dimension of rural development. Rural development denotes the actions and initiatives taken to improve the level of living of people living in the rural areas – the non-urban neighborhoods, and villages.

Rural development with reference to South African Rural Development Framework (SARDF, 1997) is helping rural people set the priorities in their own communities through effective and democratic bodies, by providing the local capacity investment in basic infrastructure and social services; justice, equity and security; dealing with the injustices of the past and ensuring safety and security of the rural population, especially that of women. Agreeing with earlier definitions of rural development Agbonifo (2005) therefore defines the term rural development as a general improvement in the life of rural inhabitants, namely their income, health and their intellect or capacity to sustain the improved living conditions. Since much of the agricultural activities especially in developing world take place in the rural areas, the tendency for people to perceive rural development as being synonymous with agricultural development is high but agricultural development is only an aspect of rural development. That is, rural development is more comprehensive. The importance attached to rural development cannot be over emphasized because according to FAO (1985) "people are every nation's

most important resource. Their production and consumption are the driving forces behind national development. A Nation in which a large part of the population suffers the scourge of poverty cannot hope to reach its full potential".

3.8 The Concept of Livelihood

The term livelihood attempts to capture not just what people do in order to make a living, but the resources that provide them with capability to build a satisfactory living, the factors they must consider in managing their resources, the institutional and policy context that either helps or hinders them in their pursuit of an improved living. Wikipedia defined livelihood as a set of economic activities involving self-employment, and or wage employment by using one's endowments (both human and material) to generate adequate resources for meeting the requirements of the self and household on a sustainable basis with dignity. The activity is usually carried out repeatedly for instance; a fisherman's livelihood depends on the availability and accessibility of fish. Chambers and Conway (1992) opined that livelihood comprises the capabilities assets activities required for means of living.

Similarly, Ellis (2000) defines livelihood as comprising the assets (natural, physical, human and socio capital), the activities, and the access to these (mediated by institutions and social relations) that together determine the living gained by the individual or household. According to Kimble (1960), Prandit (1965) and Freeman (1975) livelihood is described as the ways in which people make a living. It mainly points to the economic resource base people have at their disposal to achieve success. Frankenberg and McKesson (1988) viewed the concept of livelihood as the sustainable access to resources to meet basic needs including adequate access to food, portable water, health

facilities, educational opportunities, housing, time for community participation and social integration. Dekker (2002) asserted that the current livelihood studies have concentrated on the actions and strategies of people trying to make a living in adverse circumstances such as economic and political adversity. He further stated that the concept of livelihood is used mostly to address the issue of poverty that aims to be people oriented, non-sectional and grounded in multidimensional reality on daily life. This livelihood, according to Rahman *et al*. (2007) is broader than income; it includes everything done to obtain a living. From this forgoing rural livelihood could be explained as ability of rural households to judiciously utilize resources at their disposal by engaging in activities that enables them make a living. In essence, livelihood in this respect may be looked at in terms of quality of life, level of living or way of life. Key concepts that repeatedly feature in explaining rural livelihoods are further explained. These include livelihood assets (resources) livelihood activities, livelihood strategies, sustainable livelihoods and livelihood outcomes. Babulo*et al.* (2008) regarded livelihood assets as comprising both human and non-human resources upon which livelihood are built and to which people need access. According to Rakodi (1999) livelihood assets constitute a stock or capital that can be stored, accumulated, exchanged or allocated to activities to generate flow of income or means of livelihood or other benefits. According to Carney (1998) the assets includes:

(i) Natural capital is the term used for the resource stocks from which resource flow and services (e.g. Crops, forests, wild plants, water, land, environmental resources) useful for livelihoods are derived.

(ii) Physical capital comprises the basic infrastructure and producer goods needed to support livelihoods (e.g. Affordable transport secure shelter and buildings, adequate water supply and sanitation, access to information and

communications). This is also productive and household assets, including tools, production equipments, housing and household goods.

(iii) Human capital represents the skills, knowledge, creativity, experiences, ability to labour and good health that, together, enable people to pursue different livelihood strategies and achieve their livelihood objectives.

(iv) Financial capital denotes the financial resources (cash, savings, regular remittances or pensions) which are available to people and provide them with different livelihood option.

(v) Social capital means the social resources upon which people draw in pursuit of their livelihood objectives. It is about the quality of relationship among people and the extent to which one can count on support by the family or mutual assistance. These include networks, membership of groups, relationships of society, upon which people draw in pursuit of livelihoods.

Livelihood strategies according to Babulo*et al*. (2008) can be regarded as the full portfolio of activities that people undertake in order to achieve their livelihood outcomes and objectives. Ellis (2000), in his own contribution, posited that livelihood strategy does not encompass only activities that generate income but many kind of choices, including cultural and social choices, that come together to make up the primary occupation of a household. Examples of such socio-cultural choices among rural households include migration of male heads of household in pursuit of better livelihood, reliance on remittances, and pensions by retired members of households and resorting to indecent acts of begging and prostitution.

Livelihood activities on the other hand are sets of actions of activities through which households gain their means of living. Parrot *et al*., (2006) divided livelihood activities into four categories namely:

(i) Production activities: those activities that produce goods and services that contributes to income (the value of goods and services that are actually or potentially tradable). Production activities involve integrating the classical economic classification of production factors- land, labour, and capital.

(ii) Reproduction activities: these are sometimes called household maintenance activities, and are activities such as child care, cooking and cleaning. These are not generally tradable but are nevertheless essential for the well-being of household members and the reproduction of the conditions through which a family survives.

(iii) Consumption activities: These activities can be seen as satisfying material wants and needs through the provision of items such as food, clothing or medical services etc.

(iv) Exchange activities: relates to the transfer of goods and services or information between individuals. The activities include for example, commercial trade, barter, and gift giving. They do not necessarily involve cash or reciprocity. The exchange of goods and services is very often a significant and dynamic component of rural economies.

A livelihood is sustainable when it can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base (Chambers and Conway, 1992). The sustainable livelihoods idea was first

introduced by the Brundland Commission on Environment and Development, and the 1992 United Nations Conference on Environment and Development expanded the concepts, advocating for the achievement of sustainable livelihoods as a broad goal for poverty eradication (Lasse, 2001). Chambers and Conway (1992) argued that such definitions must include the ability to avoid, more usually withstanding and recovering from stresses and shocks.

3.9 Conceptual Model

Ekong (2003) views theoretical model as a broad system of explanation which is founded not so much on prior research findings but largely on untested and unproved assumption about social realities. Furthermore, Asika, (2001), reported that these relationships and functions can be represented schematically or mathematically.

As depicted in figure 1, CBARD project characteristics such as animal traction scheme, motorized pump scheme, tractor hiring scheme, boreholes/wells, social centers(recreation), health clinics, farm inputs (improved millet variety, improved sorghum variety, improved soybean variety, improved groundnut variety, improved rice variety, improved maize variety, storage bin and fertilizer) constitute the independent variables. The dependent variables include; crop output, yield, income, and level of living.While the impact of the project was determined by improved crop output,improved crop yield,improved income, and improved level of living.

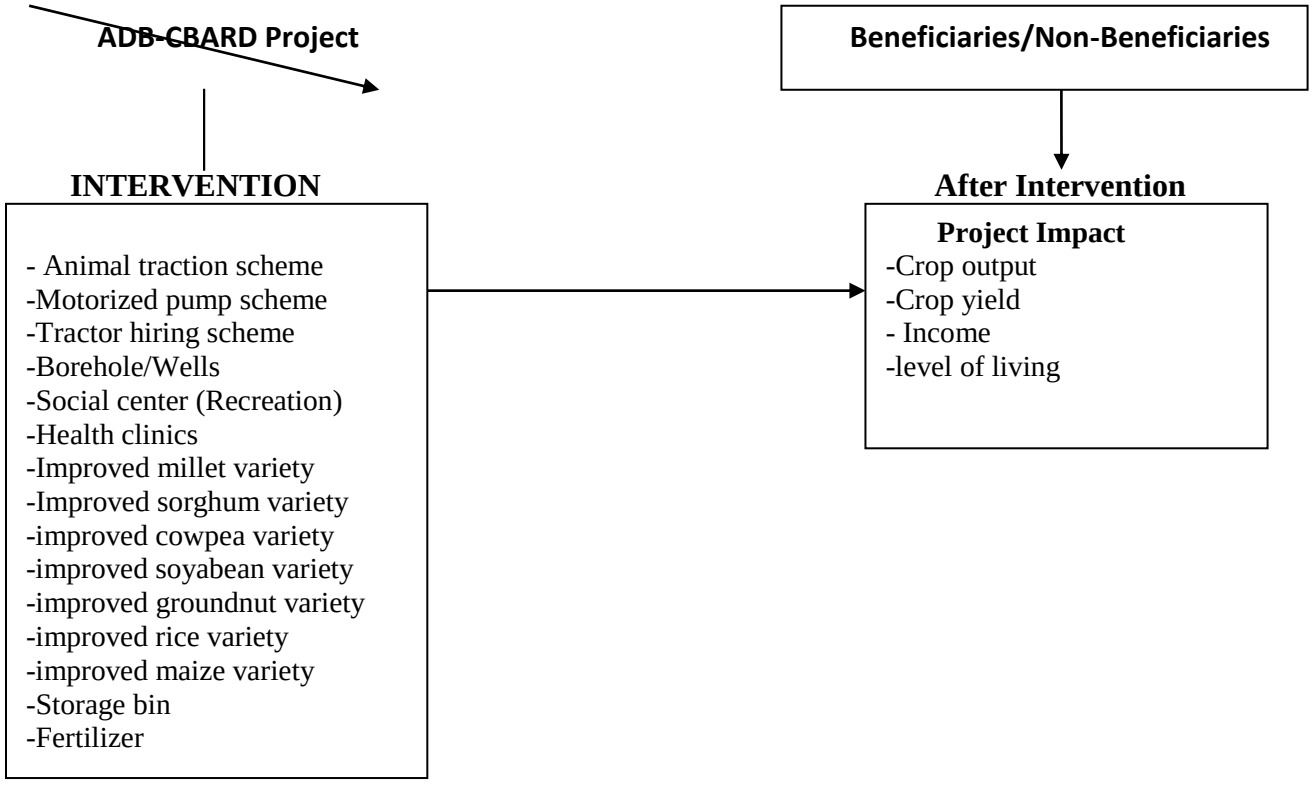


Figure 1: A model of impact of Community-Based Agriculture and Rural Development Project on crop production and rural livelihoods.

CHAPTER FOUR

METHODOLOGY

4.1 The Study Area

The study was conducted in Kaduna State; which comprises of Northern, Central and Southern senatorial zones and Northern, Central and Southern agricultural zones of Bauchi State. The decisionto base the study on senatorial zones is made in order to identify the impact of the project in the ecological areas comprising the agricultural zones in the States. Kaduna State is located between latitude 1^{o} and 12^{o} N and extends from longitude 6^{o} and 9^{o}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 45,786km^2 with only about 30,000km^2 under cultivation by traditional low-income group (Wikipedia, 2013). Kaduna State share common borders with Abuja and six other States which comprises of Katsina, Kano, Zamfara , Nasarawa, Plateau and Niger.(Wikipedia, 2013).

Kaduna State is marked with two distinct seasons of wet and dry. The wet season which commences in the month of April in the Southern part of the State and late June in the Northern part. The dry season extends from October to March and is marked by the hot dry north easterly harmattan winds. The mean annual rainfall shows a marked decrease from South to North (1524-633mm). 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).

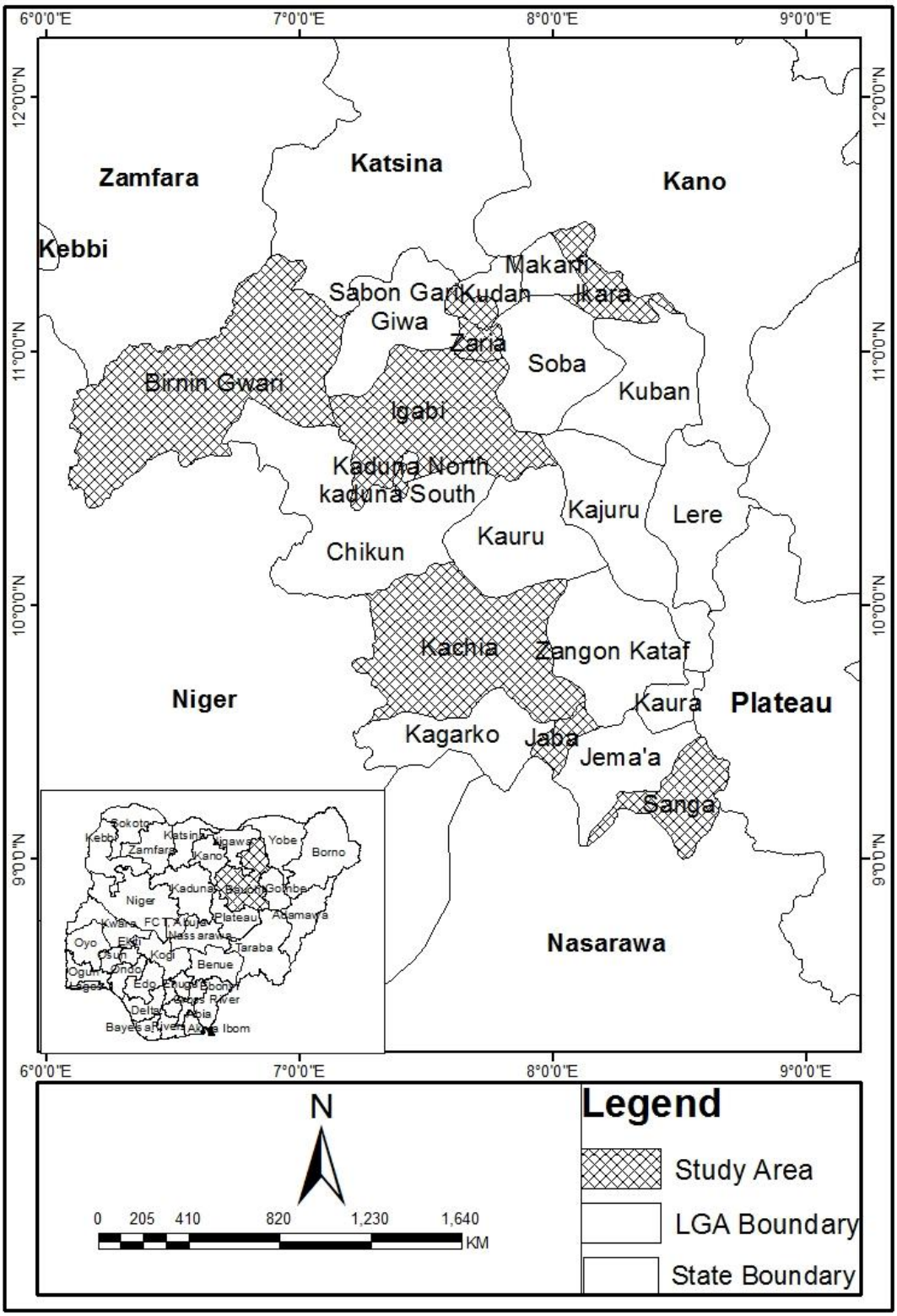


Fig. 2: Map of Kaduna State showing the Study Areas

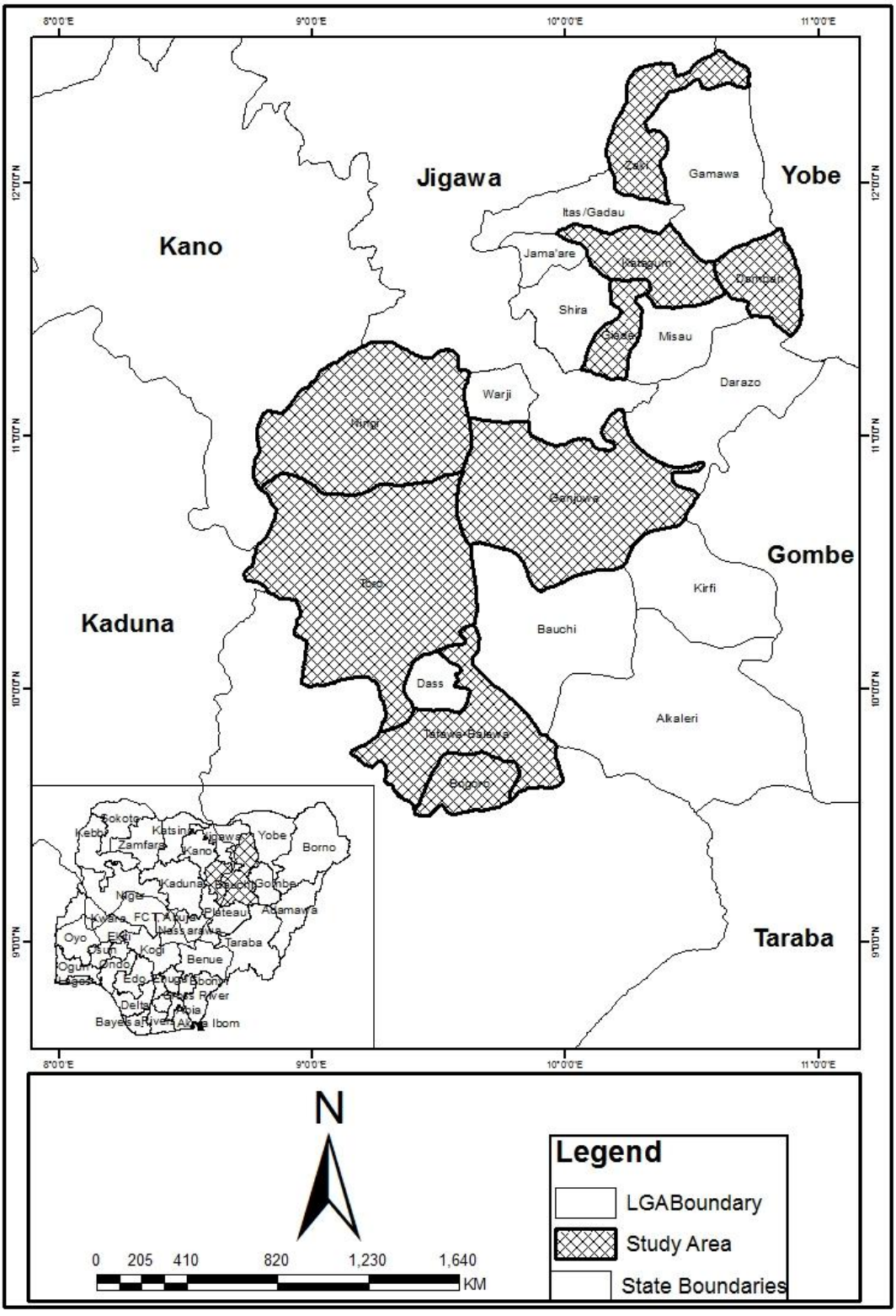


Fig. 3: Map of Bauchi State Showing the Study Areas

Rain-fed agriculture is mostly practiced in the State with little fadama farming. Crop production is still manually done in small-scattered pieces of land with the use of implements such as hoes, cutlasses, knives and axes with very few medium and large-scale farmers that are engaged in tractor ploughing which is visible along access roads. The people of Kaduna State comprise of many ethnic groups and majority of the people are engaged in farming mainly on subsistence level. However, there are some other income earning activities which are being carried out by the people such as black-smiting, basket and mat weaving, wood carrying, hunting and fishing (Chikwendu, 2005). 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.

Another area covered by the study was Bauchi State. Bauchi State occupies a total land area of 49,119km² representing about 5.3% of Nigeria's total land mass and is located between latitudes 9º3′ and 12º3′ north and longitudes 8º50′ and 11º east (Wikipedia, 2013). The State is bordered by seven other States- Kano and Jigawa to the north, Taraba and Plateau to the south, Gombe and Yobe to the east and Kaduna to the west. Bauchi State is one of the States in northern part of Nigeria that span two distinctive vegetation zones, namely, the sudan savannah and the sahel savannah. 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 people of Bauchi State comprises of many ethnic groups and majority are engaged in farming mainly on subsistence level. Bauchi State is an agriculture State. Its vast fertile soil is an added advantage for agricultural products which include maize, rice, millet, groundnut, and guinea corn. Irrigation farming is practiced and supported by the use of dams like Balanga dam etc. Cattle and other livestock are also reared in the State. 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 (Wikipedia, 2013).

4.2 SamplingProcedure andSample Size

Data were collected in all the participating Local Government Areas in Kadunaand 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 population of beneficiaries were collected from Kaduna and Bauchi ADPs. Each benefiting 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, equal sample population 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 (Table4.1).

Table 4.1: Showing samplesizeand samplingprocedure of respondents.

State	LGA	Beneficiaries		Non-beneficiaries	
		Sample frame	Sample size	Sample frame	Sample size
Kaduna	Birnin Gwari	45	23	45	23
		0	58	0	58
	Igabi	11	43	11	43
	Ikara	54	54	54	54
	Jaba	86	69	86	69
	Kachia	4	30	4	30
	Kaduna South	10	57	10	57
		70	32	70	32
	Sabon Gari	13	51	13	51
		85		85	
	Sanga	60		60	
	Zaria	4		4	
		11		11	
		39		39	
		64		64	
		4		4	
		10		10	
		13		13	
Bauchi	Katagum	45	23	45	23
	Bambam	0	30	0	30
	T/Balwa	60	32	60	32
	Bogoro	0	50	0	50
	Toro	64	50	64	50
	Ganjuwa	4	30	4	30
	Ningi	10	40	10	40
	Giade	00	35	00	35
	Zaki	10	40	10	40
		02		02	
		60		60	
		9		9	
		80		80	
		4		4	
		70		70	
		5		5	
		80		80	
		0		0	
Total		**14936**	**746**	**14936**	**746**

4.3 Data Collection

The data collection for this study was done through the use of detailed and well-structured questionnaire and interview schedule. Primary data was collected and used for this study. 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. The field data were collected in June, 2014. 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.

The data collected included: data on age, sex, marital status, household size, educational level, farm size, farming experience, extension contact, membership of cooperative societies, access to credit, access to input, accessibility to project intervention such as animal traction scheme, motorize pump scheme, tractor hiring scheme, boreholes/wells, market, social centre(recreation), health clinics, improved millet varieties, sorghum, cowpea, rice, soybean, maize, storage bin, seed dressing chemical, fertilizer, output, yield, income and level of livingduring the project intervention.

4.4 Validity and Reliability of the Instruments

Validity and reliability of the instruments used for data collection were determined to achieve a successful and appropriate result. Validity refers to measuring what is supposed to be measured. It shows the extent of unbiaseness of a measure of a set on indicator. (Yaffee, 1999). Content validity was used to measure the adequacy of the instrument items in study. Content validity in this context sought to determine the

relevance and adequacy of items included in the instrument. Jury method was employed to subject the entire instrument to the scrutiny of relevant experts. Each judge or expert was requested to independently give his expert opinion on the relevance and adequacy of the items vis-à-vis objectives of the study.

An instrument is considered reliable when it consistently produces the same result when applied to the same sample many times over. The test and retest method of applying instrument reliability was adopted for this study. In order to achieve this, 5 % of the total number of questionnaires sampled was administered to the respondents at an interval of one month to determine the consistency of the analytical instrument based on which the analytical tools were chosen.

4.5 Analytical Techniques

4.5.1 Descriptive statistics

Descriptive statistics such as means, tables, percentages, frequency distribution, and ranking were used to achieve objectives 1, 2, 5 and 6.

4.5.2 Logit regression model

Logit regression model was used to achieve objective 3 which is factors influencing adoption of recommended crop varieties by ADB-CBARD Project. This logit regression model is one of the binary choice models in which a dichotomous regression variable is considered as the dependent variable and this dichotomous variable is related to a set of independent variables that were hypothesized to influence the outcome from set of paired variables. In this study, the outcome variable participation is binary (i.e. beneficiaries and non-beneficiaries) hence was assigned 1 for beneficiaries of the project and 0 for non-beneficiaries.

The logit model of characterizing the influence of socio-economic and institutional factors is specified below:

$$(Y_1^1/X_{1,}) = 1\ldots. 9 = F(Z_1) = 1\text{-}\frac{1}{e^{-z}{}_{1\ =,}}\ e^{z}\frac{i}{1+Z,\ i\ =\ 1\ -\ n)}$$

Where:

$Z_i = a + \beta_1 X\dot{i}_1 + \beta_{2\ X\ j2} \ldots\ldots\ldots\ldots\ldots\ldots\ldots + \beta_9 X_{j9}$

Y= 1 if i^{th} is beneficiaries

0 i^{th} is non- beneficiaries

$X\dot{i}_1$= 1 – 9 are the socio-economic and institutional factors of the i^{th} beneficiaries and Non-beneficiaries define as:

X_1 = Age (Years)

X_2 = Household size(number)

X_3 = Farm size (Hectare)

X_4 = Farming experience (Years)

X_5 = Years of membership in cooperative societies (Years)

X_6 = Education (Years of formal schooling)

X_7 = Extension contact (Number of contacts in a season)

X_8 = Access to inputs (Number of inputs)

X_9 = Access to credit(Naira)

X_1-X_9 = the coefficients to be explained

4.5.3 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 objective 4. The model is specified as follows;

$$\text{F-Chow} = \left(\frac{(\text{Rss} - \text{Rss1} + \text{Rss2})/\text{K}}{\text{Rss1} + \text{Rss2}/\ \text{N1}+\text{N2}-2\text{K}} \right)$$

Where

R_{ss}= sum of squared residual from the pooled data.

R_{ss1}=sum of squares from the first group (i.e. beneficiaries)

R_{ss2}=sum of squares from the second group (i.e. non beneficiaries)

N_1N_2=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 question to build up a summary score, scale or index for the concept.

4.5.4 Operationalization and measurement of variables

Independent Variables

Age: This is the actual number of years an individual has spent from birth to the time of the study. The older people get, the less likely they are to quit their jobs. It was therefore expected in this study that age would be related to participation in ADF CBARD Project. This was measured in years as given by the respondent.

Educational level: Education refers to acquisition of knowledge through organized or formal means or through schooling. Educational level of an individual is usually

indicated by number of years in formal schooling or by educational certificates obtained or qualifications. Education is an important variable in the study, it is expected to enable farmers comprehend more to sources of information or new technologies. The level of education attained enhances an individual's management ability and understanding of government's policies. Education is also an important attribute in decision making as regards perception, adoption of innovation which may bring about increase in output, yield and income. This was measured by the total number of years spent in various levels of formal schooling.

Marital status: This is a state of been married. This was measured as 1 for married and 0 for single.

Sex: This refers to the biological characteristics for indentifying an individual as either male or female. It was measured by scoring male = 1, female = 0.

Household size: This refers to the number of people that live under the same roof. The size of the household is a potential to labour availability to the household. It is expected to be positively related to participation in ADF CBARD Project given the labour intensive nature of agricultural practices. Household size was measured by the number of dependants given by a household head during the study period.

Farm size: This refers to the total land area belonging to the farmer under cultivation. Land is an important variable in agricultural production and it was measured in hectares.

Farming experience: This refers to the number of years the respondent has been in farming. It is an indicator of managerial ability. This was measured in years**.**

Extension contact: This refers to the frequency of contact of farmers with extension workers. The role of extension is to create awareness among farmers, enlightenment, demonstration of innovations and to compare the benefits of the innovations. This was measured by the number of times a farmer received such visits or contacts.

Membership of cooperative societies: It is assumed that the more farmers get involved in worthwhile activities in their communities, the more they appreciate working with one another in social programmes. It is expected that being a member of any organization or association will give a respondent access to some useful information necessary for increased farming activities. This was measured by Yes if they belonged and No if they do not belong to any cooperative society.

Access to credit: This refers to money received in naira from institutional or non-institutional organizations. Access to credit has great potentials to influence farmer's interest in innovations. This was measured by Yes if they had access to credit and No if they did not have access to credit.

Animal traction scheme

This refers to the use of work bulls in the farm. This was measured by the extent to which these work animals are accessible to the project beneficiaries i.e. easily ace ssible=3, fairly accessible=2, not accessible=1

Tractor hiring scheme

This refers to the use of engine powered machine to work in the farm. This was measured by the accessibility of tractors for rent to the beneficiaries of the CBARD

project during the period of production i.e. easily accessible=3, fairly accessible=2, not accessible=1

Social Centre

This refers to the establishment of a recreational centre in study area for film or video show on modern crop production, government programmes, democracy, awareness campaign on family planning, HIV/AIDS. This was measured by asking the respondents to indicate from list, the services obtained from the social centre. Each service will score one. The sum of these services will constitute each respondent total score.

Clinics

This refers to the established health dispensaries in the study area to take care of the rural dwellers health problems. This was measured by the accessibility of the health services of the project beneficiaries household i.e. easily accessible=3, fairly accessible=2, not accessible=1.

Farm inputs

This describes a package of farm inputs made available to project beneficiaries. They included improved millet variety, improved sorghum variety, improved cowpea variety, storage chemicals, seed dressing chemicals and fertilizers. These were measured in kilogram (kg).

Rural employment opportunities

This refers to a set of economic activities involving self –employment, and or wage employment by using one's endowment (both human and material) to generate adequate resources for meeting the requirements of the self and household on a sustainable basis

with dignity. This was measured by the total number of job opportunities listed by the respondents.

4.5.5 Dependent variables

Crop output

Thisrefers to the total quantity of cropsproduced within the season of study. This was measured in 100 kilogram bag obtained by beneficiaries and non-beneficiaries.

Crop yield

This is the total crops produced by the farmer at the end of the growing season divided by the total hectares of land under production. This was measured in kilogram per hectare.

Farm income

Farm income was computed as the money realized from the sale of farm output for each cropping season. The variable was measured in Naira.

Farmer's level of living

This is the relative quality of life of household in the study area. It is assumed that participation in development enhances the likelihood of better life chances of farmers and level of living. To measure the household level of living with precision is very difficult as perceptions differ in various areas among diverse societies. However, material possessions of farmers as well as general expenditure were used as indicators oflevel of living. The total value of assets possessed by a farmer at present were estimated and was converted to Naira value. The farmers with value of assets equivalent

to the average (and above) of the total were scored 1 (high), while those with the total value of assets less than the average were scored 0, (low).

CHAPTER FIVE

RESULTS AND DISCUSSIONS

This chapter presents the results of the study on the basis of its specific objectives.

5.1 Socio-economic Characteristics of Respondents

Table 5.1 presents the distribution of respondents according to their socio-economic characteristics.

5.1.1 Age

Ages of respondents examined and presented in Table 5.1 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.

Table 5.1: Age of Respondents

Variable	**Beneficiaries**		**Non-Beneficiaries**	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Age (years)				
21 – 30	37	4.9	Nil	Nil
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
Mean	**51.98**		**49.16**	

5.1.2 Gender and marital status

The entries in Table 5.2 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 andare married.

Table 5.2: Genderand marital status of Respondents

Variables	**Beneficiaries**		**Non-Beneficiaries**	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Gender				
Male	599	80.3	652	87.4
Female	147	19.7	94	12.6

Marital status

Married	709	95.0	723	96.9
Single	37	5.0	23	3.1

5.1.3 Educational qualification

For educational qualification, Table 5.3 shows that 27.1% of the beneficiaries hadIslammiya 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.

Table 5.3: Educational level of Respondents

Variable	Beneficiaries		Non-Beneficiaries	
	Frequency	Percentage	Frequency	Percentage
Education				
No formal education	109	14.6	93	12.5
Primary education	199	26.6	116	15.5
Secondary education	146	19.6	116	15.5
Tertiary education	90	12.1	165	22.1
Islammiya education	202	27.1	256	34.3

5.1.4 Household size

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.

Table 5.4: Household size of Respondents

Variable	Beneficiaries		Non-Beneficiaries	
	Frequency	Percentage	Frequency	Percentage
Household size				
1 – 5	149	20	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
Mean	**11.77**		**10.42**	

5.1.5 Farm size

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.

Table 5.5: Farm size of the respondents

Variable	**Beneficiaries**		**Non-Beneficiaries**	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Farm Size				
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	Nil	Nil
Mean	**1.32**		**1.0**	

5.1.6 Farming experience

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 5.6 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.

Table 5.6: Farming experience Respondents

Variable	**Beneficiaries**		**Non-Beneficiaries**	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Farming experience				
0 – 5	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
Mean	**30**		**30.16**	

5.1.7 Extension contact

The findings in Table 5.7 reveal 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

Table 5.7: Extension contact of respondents

Variable	**Beneficiaries**		**Non-Beneficiaries**	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Extension contact				

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
Mean	**16.6**		**8.26**	

5.1.8 Membership of cooperative societies

Cooperative groups are organized for the promotion of special interest or meet certain needs that cannot be achieved by the individual's efforts. They contributed to the dissemination of new ideas, practices and products. The result in Table 5.8 revealed that 93.7 % of beneficiaries were members of co-operative associations. This result showed that CBARD Project beneficiaries were properly organized for easy access to subsidy, an indication that the more farmers participated in cooperative societies, the better the idea, knowledge and benefits derived from among members.

Table 5.8: Membership of cooperative association of Respondents

Variable	**Beneficiaries**		**Non-Beneficiaries**	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Membership				
Non member	47	6.3	440	59.0
Member	699	93.7	306	41.0

Mean	**11.64**	**6.37**

5.1.9 Access to credit

Nigerian agriculture is essentially traditional and subsistence in nature. Given the requirement of finance in the agricultural sector, very few farmers will have capital of their own to invest in agriculture. Most farm families hardly have any savings to plough back into production, considering the pattern of their income and expenditure. (Ammani*et al.* 2010).Capital is an important factor in production. The result on access to credit indicated that 32 % of the beneficiaries had access to credit. Similarly, 3.1 % of the non-beneficiaries had access to credit. Probing further, it was discovered that the CBARD Project beneficiaries were given farm inputs like fertilizers, recommended seeds, storage bins etc instead of credit facilities. May be the Project co-ordinators did not want the diversion of the credit. Therefore, limited access to credit facilities as reported by the respondents have been implicated as hindrance to the growth and productivity of agricultural sector.

Table 5.9: Access to Credit of the respondents

Variable	**Beneficiaries**		**Non-Beneficiaries**	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Access to credit				
Yes	259	32	23	3.1

No	507	68	723	96.9

5.2.1 The level of adoption of improved crop varieties of beneficiaries and non-beneficiaries

Table 5.10 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 nill 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. The collaboration according to (PIU, 2013), 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 (PIU, 2013).

Table 5.10: Level of adoption of improved crop varieties among Beneficiaries and Non-Beneficiaries of ADB-CBARD Project

Variables	**Beneficiaries**		**Non-Beneficiaries**	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Cowpea Variety(n=2)				
IT 93K-45	560	75.1	120	16.1
IT 90K 45-1	653	87.5	48	6.4
Groundnut variety(n=1)				
Ex Dakar	708	94.9	23	3.1

Rice variety(n=2)				
Faro	674	90.3	94	12.6
Nerica	491	65.8	94	12.6
Sorghum ICSV 400(n=1)	689	92.4	119	16.0
Soya bean variety(n=2)				
TGX 1448-2E	654	87.7	95	12.7
TGX 1740-2E	489	65.5	117	15.7
Millet variety(n=1)				
So SAT C88	600	80.4	47	6.3
Maize variety(n=5)				
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

5.2.2 Impact oflevel of adoption of improved crop varieties

Analysis was carried out to ascertain the impactof the level of adoption of improved recommended crop varieties between the ADB-CBARD Projectbeneficiaries and non-beneficiaries in the study area. As revealed in Table 5.11 the F-chow calculated value of cowpea variety IT 93K-45was 5580.88while 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 Exdakar, the F-chow value was 3233.12 while the F-value was 2.22, the difference was significant. Also in ricevarieties 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. Nill 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 thatADB-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 5.11**:** Impact on level of adoption of crops' varieties

Varieties	Mean(%)	SD	CV	SSR_1	SSR_2	F-Chow
It93k-45				4.24	1.005	5580.88
Non-beneficiairies	16.09	0.37	2.29			
Beneficiairies	75.07	0.43	0.58			
It90k 45-1				4.39	0.07	6650.35***
Non- beneficiairies	6.43	0.25	3.82			
Beneficiairies	87.53	0.33	0.38			
Exdakar				8.55	0.00	3232.12***
Non- beneficiairies	3.08	0.17	5.61			
Beneficiairies	94.91	0.22	0.23			
Faro				5.36	0.79	4686.739***
Non- beneficiairies	12.60	0.33	2.64			
Beneficiairies	90.35	0.30	0.33			
Nerica				0.343	0.79	27633.31***
Non- beneficiairies	12.60	0.33	2.64			
Adopters	65.82	0.47	0.72			
Iccv400				6.28	2.71	3049.69***
Non- beneficiairies	15.95	0.37	2.30			
Beneficiairies	92.23	0.27	0.29			
Tgx14482e				4.38	0.84	5609.98***
Non- beneficiairies	12.73	0.33	2.62			
Beneficiairies	87.67	0.33	0.38			
Tgx7402e				0.31	2.45	11064.24***
Non- beneficiairies	15.68	0.36	2.32			
Beneficiairies	65.55	0.48	0.73			
Sosatc88				4.24	0.06	6917.96***
Non- beneficiairies	6.30	0.24	3.86			
Beneficiairies	80.43	0.40	0.49			
Tz95eew				4.37	16.09	1062.71***
Non- beneficiairies	25.335	0.4352	1.7179			
Beneficiairies	87.265	0.3336	0.3823			
Tz95eey				8.55	Nil	Nil
Non- beneficiairies	0	0	Nil			
Beneficiairies	94.906	0.22	0.2318			
Tz95ew				6.67	Nil	Nil
Non- beneficiairies	0	0	Nil			
Beneficiairies	92.761	0.2593	0.2795			
Striga				0.001	2.56	11907.27***
Non- beneficiairies	15.818	0.3652	2.3085			
Beneficiairies	55.764	0.497	0.8913			
Across97				0.976	11.49	2061.20***
Non- beneficiairies	21.85	0.4135	1.8925			
Beneficiairies	68.097	0.4664	0.6849			

Note:F-critical** = 2.22, **SSR_1** = Sum of Square Residual for the Beneficiaries, **SSR_2**= Sum of Square Residual for the Non-beneficiaries, **SD**= Standard Deviation, **CV**= Coefficient of Variation, = Significant at 1% level of*probability*

5.3 Logit Regression Model Analysis for Factors Influencing Adoption of ADB-CBARD Project Interventions.

From the result of logit regression in Table 5.12,farming experience, extension contact and access to input were significant at 1%level of probability. 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 effect. 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. With more experience in farming, farmers are less likely to oppose the adoption of new technologies. Also, a farmer's experience can generate more confidence, thus, farming experience can have positive effects on farmers' decision. Similarly, agricultural extension service constitutes a driving force for any agricultural development. The relationship between agricultural extension agent and the farmer is an important determinant in the adoption and sustenance of improved farm practices.

A major goal of development policy in developing countries is the improvement of the income of the majority of the people. Access to farm input hadsubstantial positive impact on levels of productive investment.Further analysis revealed that age and years of membership of co-operative societies were significant at 5 % level of probability. It is expected that the older the respondent, the greater their participation in development programmes because of the respondents experience in social dynamics and resource use. The older farmers get, the less likely they are to quit their jobs. That is the overwhelming conclusion arrived at by some Scientists (Porter and Steers, 1973,

Mobley *et al*, 1979 and Rhode, 1983) which were based on study of age-turn over relationship. This is because as workers get older, they tend to have fewer alternatives of job opportunities. In addition, older workers are less likely to resign their jobs because their longer tenure tends to provide them with higher wage rates, longer paid vacations and more attractive benefits (Robbins, 1989). The Author concludes that older workers are stable, have fewer avoidable absences more productive and satisfied with their jobs. This will translate into higher productivity. The fact that the beneficiaries belonged to cooperative societies shows that the farmers under the project were properly organized for easy access to farm inputs, an indication that the more farmers participate in cooperative societies, the better the idea, knowledge and benefits derived from among members. The farm size was significant at 10 % level of probability. Most rural farmers owned small holdings, an indication that the farmers operate at small scale production level, (Abdullahi, 2010). Going by Olayide *et al*. (1980), classification of farm size of 0.1 hectares to 5.9 hectares as small farms, it then implies that most of the beneficiaries are small-scale farmers. This will not allow for meaningful investment and returns to scale on adoption of recommended crop varieties. These attributes of the farmers will likely reduce the adoptions of innovations. The result suggests that farm size affects adoption costs, risk perception, human capital, labour requirement, tenure arrangement and more.

Table 5.12: Logit regression model analysis of factorsinfluencing adoption of ADB-CBARD Project Intervention.

Variables	**Coefficients**	**Standard Error**	**t-value**
Constant	4.084127	2.221015	-1.84*
Age	0.1153305	0.053493	2.16**
Household size	-0.0624364	0.0694345	-0.90
Farm size	0.392092	0.208107	1.88*
Farming experience	-0.1612436	0.0485504	-3.32***
Years of membership of Cooperative Society	0.0885658	0.0393267	2.25**
Education	-0.4280819	0.2839193	-1.51
Extension contact	0.1373837	0.0431573	3.18***
Access to credit	-0.553938	1.392943	-0.4
Access to input	5.6700	1.8400	3.08***

Pseudo $R^2 = 0.42$

Log likelihood= -28.58

*** P<0.01, ** P<0.05 and *P<0.10.

5.4 Hypotheses Testing (Objective iv)

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 5.13 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 Bello*et 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 5.13: Chow test result showing impact of project on output, yield, income and level of living

Variable	RSS	**RSS1**	RSS2	N1	N2	**F-chow**	F-crit.
Output	1.16E+11	1.16E+11	8.71E+09	746	746	24.66	3.01*
Yield	8.80E+10	8.77E+10	6.60E+09	746	746	4.40	3.01*
Income Level	2.31E+14	8.54+13	7.22E+13	746	746	4.40	3.01*

of Living	1.40E+15	1.08E+15	6.33E+13	746	746	42.11	3.01*

*P<0.01

5.5 Rural Employment opportunities Created by the CBARD Project

Thefindings in Table 5.14 indicate that the rural populace in the study areas have now diverse pathways by which they can enhance their living conditions. However, these wage earning opportunities have great potentials to contribute in alleviating poverty and improving rural livelihood in the study areas. About 83% of the respondents indicated interest in petty trading, 26.8% in commercial transportation, 49.1% in crops processing and milling, 17.0% in water vending, 9.9% in craft work, 9.7% in bricklaying, 9.8% in seed multiplication, 7.4% in hired labour and 7.3% were engaged in animal traction. Olukosi (2002), opined that for development programmes to succeed, there is a need to not only involve the community in development projects in a bottom-up manner but empowering them to initiate project based on their felt needs and priorities, planned by themselves, implemented by themselves with outsiders as facilitators, hence, user friendly approach. It assumes that widespread participation will lead to more widespread distribution of benefits in the form of wage earning activities etc.

Table 5.14: Rural Employment Opportunities Created by CBARD Project

Rural Employment Opportunities	**Frequency***	**%age**
Petty Trading	619	83
Crop Processing and Milling	366	49.1
Commercial Transportation	200	26.8

Water Vending	127	17.0
Craftwork	74	9.9
Bricklaying	72	9.7
Seed Multiplication	73	9.8
Hired Labour	55	7.4
Animal Traction	54	7.3

* Multiple responses

5.6 Constraints to Effective Participation in CBARD Project

The result of the analysis of constraints faced by farmers in the project is shown on Table 5.15. The results show that inadequate capital had the highest rating as indicated by 87.9% of beneficiaries of CBARD Project. This was followed by inadequate processing and storage facilities which showed 83.1%. Low Western Literacy Level 72.9%, Low prices for farm produce had 71%, High cost of agrochemicals 63.4%, Poor road infrastructure 56.1%, poor recreation facilities 53.8%, delay in the distribution of subsidized farm inputs was 44.5%.

These are discussed in details as follows:

Inadequate capital

The respondents (87.9%)reported inadequate capital as a major constraint in their participation in ADF CBARD Project. The importance of credit to agricultural development cannot be overemphasized. Credit enables farmers to advantageously use inputs and factors of production by granting farmers more access to resources through the removal of financial constraints. The provision of credit will reduce the costs of capital intensive technology and assets relative to family labour. Thus, instead of

growing low yielding local crops, for example, access to credit may allow an increased use of improved seeds and fertilizers leading to higher crop output per unit of labour and land (Ammani*et al.* 2010).Looking generally at this constraint, it is assumed that shortage of capital was a major constraint. This was as a result of project implementers not given much capital to the beneficiaries directly to avoid diversion and misuse of project fund rather the inputs such as fertilizers; seeds; storage bins etc were subsidized and given to the beneficiaries. However, due to the fact that inputs were subsidized, the beneficiaries had bumper harvest.

Inadequate processing and storage facilities

About 83.1% of the respondents reported inadequate processing and storage facilities as the second constraint encountered in the ADF CBARD Project. However, it is an established fact that inadequate processing and storage facilities often leads to perishability of some crops, pest attack of farm products, farmers fumigating their products wasting. Similarly, processing facilities like thresher, miller and grater are very expensive to procure, highly technical for local farmers to operate and very difficult and expensive to maintain. This led to great loss in farm revenue and the risk involved in losing revenue by farmers from their investments could reduce the level of production in agriculture.

Low western literacy level

Result of the survey shows that 72.9% of the respondents reported low western literacy level as one of the constraints. Oladipo (1999) asserted that formal education enhances productivity and production efficiency as well as the ability to sharpen individuals managerial skills. However, the low level western education level was attributed to the

fact that Islamiyya education is much more emphasized in the study areas at the expense of the Western education. This constrained the farmers understanding abilities of numerical and literacy of adopting recommended farm practices.

Low prices for farm produce

The farmers (71%) were constrained by low prices for farm produce. These were reportedly caused by the actions of the middlemen. The middleman is the bridge between the farmer and the market place. In the Nigerian context, it is the business man who goes to the hinterland to purchase the agricultural products from the farmer in the village market and transports same to the markets where the final consumer gets it. Other causes of low prices include glut, perishability, seasonality, weather condition, inadequate storage facilities, poor communication, lack of proper processing and packaging, over supply at season and remoteness of rural communities. All these constraints bring about low prices and the rural farmer bears the brunt. The implication is that farmers are at the expense of these middlemen who take the advantage of the situation to get higher income than the farmers.

High cost of agrochemicals

The result shows that 63.4% of the respondents reported high cost of agrochemicals as a constraint. Agrochemicals are considered as a powerful weapon or magic bullets in the developing countries in order to enhance the agricultural productivity and considerably improve the major public health indices as well. Due to the awareness of the benefits of agrochemicals, the respondents adopted the technology. However, the subsidized input was not enough coupled with high cost of buying personal protective devices. The

implication is that there was increase in cost of production and the farmers were affected economically.

Poor road infrastructure

Similarly, about 56.1% of the respondents reported poor road infrastructure as a constraint. The existence of poor road infrastructure will inevitably impact negatively on the competitiveness of African agriculture through increasing internal transport costs. Due to poor road network in our rural communities, the farmers found it very difficult to bring their agricultural products to the market especially during rainy season. The implication is that the farmers dispose of their products at ridiculously low price and are at the mercy of middlemen.

Poor recreation facilities

Similarly, about 53.8% of the respondents indicated poor recreation facilities as a constraint. Recreational facilities like television viewing centers, rural telephony and recreational parksare lacking in most rural areas. This often leads to rural-urban drifts, reduction in the working population in the village and low agricultural production. The implication is that as well as these amenities are in short supply, healthy youths will continue to migrate to the urban centers in search of jobs which are not there. But, the availability of these amenities will automatically reduce the rural-urban drift and more hands will be engaged in agricultural production which will translate into food security.

Delay in the distribution of subsidized farm inputs

The analysis shows that about 44.5% of the respondents indicated delay in the distribution of subsidized farm inputs as a constraint. This is as a result of the chain of bureaucracy and protocols involved in a project of this nature. In order to ensure

transparency and accountability in a project of this nature and magnitude, certain protocols must be observed and this brings about the delay in the distribution of subsidized farm inputs. The implication is that delay of this nature brings about interference in agricultural production in the study area.

Table5.15: Constraints for effective participation in CBARD Project

Constraints	**Frequency***	**Percentage**	**Ranking**
Inadequate capital	656	87.9	1st
Inadequate processing and storage facilities	620	83.1	2nd
Low western literacy level	529	72.9	3rd
Low prices for farm produce	529	71.0	4th
High cost of agro chemical	438	63.4	5th
Poor road infrastructure	421	56.1	6th
Poor recreation facilities	401	53.8	7th
Delay in the distribution of subsidized farm inputs	332	44.5	8th

* Multiple responses

CHAPTER SIX

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary

The broad objective to analyze the impact of Community Based Agriculture and Rural Development Project on crop production and other forms of rural livelihoods in Kaduna and Bauchi States, Nigeria. Specifically, the objectives were to:describe the socio-economic characteristics of beneficiaries ofADB-CBARD Project in the study area;

assess the level of adoption of improved crop varieties by beneficiaries ofADB-CBARD Project in the study area;determine socio-economic and institutional factors influencing adoption of interventions;determine the impact of the project on crop output, yield, income and level of living of beneficiaries ofADB-CBARD Project in the study area;assess the impact ofADB-CBARD project on rural employment opportunities in the study area;describe the constraints being encountered in the implementation of the African Development Fund Community Based Agriculture and Rural Development Project (ADB-CBARDP) in the study areas.

The study was carried out in Kaduna and Bauchi States, Nigeria. A total of 746 beneficiaries were randomly selected and 746 non-beneficiaries were purposively selected and were administered with questionnaire. The statistical tools used to analyze the data were descriptive statistics, logit regression and chow test statistics. The results are summarized below: The beneficiaries (38.9 %) were within the ages of 51 – 60 years and mean age of 51.98 years while non-beneficiaries (43.9 %) were within the ages of 51 – 60 years and mean age of 49.16 years. About 80.3% of the beneficiaries were male

and 19.7 % were female while 87.4 % of non-beneficiaries were male and 12.6 % female respectively. About 95 % of the beneficiaries were married and 5 % single while 96.9 % of non-beneficiaries were married and 3.1 % were single. The beneficiaries had a mean household size of 11.77 and 10.42 was for non-beneficiaries. About 27.1 % of the beneficiaries had attended Islammiya, 26.7 % had primary education. Similarly, 22.1 % of non-beneficiaries attended Islammiya and 15.5 % had primary education. Beneficiaries had a mean of 31.46 years as farming experience and 30.16 years respectively for non-beneficiaries. Beneficiaries had farm size mean of 1.32 (ha) while non-beneficiaries had mean farm size of 1.0 (ha). 32 % of beneficiaries had access to credit while non-beneficiaries had 3.1 % access to credit.

Both the beneficiaries and non-beneficiaries had extension contacts but the non-beneficiaries had fewer extension contacts. The beneficiaries had extension contact mean of 16.6 and 8.26 for non-beneficiaries. About 93.7 % of the beneficiaries were members of co-operative societies and 41.0 % of non-beneficiaries belonged too. However, the beneficiaries had a mean of 11.64 and 6.37 for non-beneficiaries. Findings of the study on the level of adoption of improved crop varieties revealed that 75.1 % of the beneficiaries adopted cowpea variety IT 93 K-45 while 16.1 % of non-beneficiaries did too. About 87.5 % beneficiaries adopted variety IT 90 K 45-1 while for non-beneficiaries, it was 6.4 %. For groundnut variety Ex-Dakar, 94.9 % of the beneficiaries adopted while 3.1 % of non-beneficiaries adopted. It was found that 90.3 % of beneficiaries adopted Faro rice while 3.1 % non-beneficiaries adopted too. For Nerica rice variety, 65.8 % beneficiaries adopted while 12.6 % non-beneficiaries did as well. Sorghum ICSV 400 variety, about 92.4 % of beneficiaries adopted while 16.0 % non-beneficiaries followed suit. Similarly, for soya bean TGX 1448-2E variety, the level of

adoption for beneficiaries was 87.7 % while 12.7 % was for non-beneficiaries. Another variety TGX 1740-2E had adoption level of 65.5 % for beneficiaries and 15.7 % for non-beneficiaries. Millet variety SOSAT C88 had adoption level of 80.4 % for beneficiaries and 6.3 % for non-beneficiaries. Early maize varieties like TZ 95 EW, striga tolerant and Across 97 had adoption level of 87.3 %, 94.9 % 92.8 %, 55.8 % and 68.1 % respectively. For non-beneficiaries TZ 95 EEW, striga tolerant and Across 97 had adoption level of 25.3 %, 15.8 % and 21.8 % while nil was recorded for TZ 95 EEY and TZ 95 EW respectively. All the adoption level impacts were highly significant at 1% level of probability.

The results of Logit regression estimates also indicated that age, farm size, farming experience, membership of cooperative societies, extension contact and access to input were all significant and therefore influenced beneficiaries' adoption of recommended crop varieties in the ADB-CBARD Project Interventions. The results of chow test statistic show that crop output, yield, income and level of livings were significant at 1% level of probability. This is because the F- chow calculated value was greater than the table values. This therefore indicated that the ADB-CBARD Project had impacted on the beneficiaries. The hypothesis were tested using chow test and the results showed that level of adoption, crop output, yield, income and level of living were all significant at 1% level of probability. The null hypothesis were rejected, and therefore the study concludes that there were significant differences between the beneficiaries and the non-beneficiaries in their improved crop adoption level, crop output, crop yield, income and level of living.

There were rural wage earning opportunities created by the project as reported by the respondents in the study area. About 83 % of the respondents indicated that petty trading had increased in the study area. 49.1 % reported crop processing and milling, 26.8 % indicated that commercial transportation had been created. Similarly, water vending had 17.04 %, 9.95 % indicated craftwork, 9.85 % mentioned were involved in seed multiplication, and 9.7 % were engaged in bricklaying. It was also found that 7.4 % were involved in hired labour and animal traction recorded 7.3 %.

In spite of the significant impact of the ADB-CBARD Project, some constraints were encountered. These constraints were ranked according to the responses of the beneficiaries. About 87.9 % reported inadequate capital. 83.1 % indicated inadequate processing and storage facilities. While 72.9 % complained of low western literary level, 71.0 % equally mentioned low prices for farm produce as a constraint. Similarly, 63.4 % of the respondents indicated high cost of agrochemicals as a constraint while 56.1 % reported poor road infrastructure. Similarly 53.8 % indicated poor recreation facilities while 44.5 % reported delay in the distribution of subsidized farm inputs as a constraint.

6.2 Conclusion

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

The ADB-CBARD Project being a development programme brought about some rural employment opportunities in the study areas. For example, the study reveals that petty trading, crop processing and milling, commercial transportation, water vending, craftwork, bricklaying, seed multiplication, hired labour and animal traction were additional income earning activities. These diversified opportunities have the potentials to reduce poverty, improve rural livelihoods and reduce ruralurbanmigration and lead to sustainable development.

However, the constraints for effective participation in ADB-CBARD Project were inadequate capital, inadequate processing and storage facilities, low western literacy level, low prices for farm produce, high cost of agro chemicals, poor road infrastructures, poor recreation facilities as well as delay in the distribution of subsidized farm inputs.

6.3 Recommendations

Based on the conclusions of this study, the following recommendations were made to enhance farmers' participation, improve agricultural developments, create enabling environment for more wage earning activities and moreover, increase improvement in income and standards of living of rural dwellers.

(i) Farmers were constrained by inadequate capital. Since there is the growing need for credit on the farm either to pay for additional farm inputs, pay for farm labour, procure agro-processing equipment and storage facilities the promotion of savings among farmers and farmer groups should be encouraged as well as encouraging the social organisations to secure loans for their members from agricultural banks.

(ii) Inadequate processing and storage facilities were reported as a constraint. Commodity market produce user programme and processing industries should be established by government to handle excess farm produce. It was discovered in the study that low education level was a constraint. Though the education variable was not a significant fact in the choice of participation in ADB-CBARD Project, the improvement in the education of the farmers will help to improve the technical efficiencies of the farmers.

(iii) Low prices for farm produce were also reported as a constraint. The government should create awareness amongst the farmers concerning the newly established agricultural cargo airports nearest to them. Farmers should be linked to available marketing channels.

(iv) High cost of agro chemicals results in increase in cost of production. The cost of agro chemicals should be subsidized so as to reduce the number of farmers buying adulterated technologies.

(v) Feeder roads should be constructed to link farm sites for easy marketing of produce outside the farmer's communities. This will reduce exploitation of middle men.

(vi) Poor recreation facilities in the rural areas encourage youth's rural-urban migration. Recreation facilities like viewing centres and rural telephony should be encouraged.

(vii) As a result of delay in the distribution of subsidized farm inputs, it is recommended that timely supply of the inputs among the project beneficiaries will enhance more efficient utilization of the production inputs. In order to ensure sustainability of the project, greater government buy-in is suggested otherwise, interventions like the ADB-CBARD Project would continue to be regarded as the business of the development partner undertaking the intervention. Government buy-in in agricultural projects like ADB-CBARD Project will enhance sustainability. It would be extremely difficult to enhance the sustainability of the project without community based organizations being fully functional. A fully functional umbrella organization for farmers is required to handle issues of capacity building for farmers, linkage with input dealers and output dealers, negotiation with credit institutions, provision of certified seeds, extension messages and other farm technologies.

6.4 Contributions to Knowledge

(i) There was high level (>90%) of adoption of ADB-CBARD project recommended crop varieties by the beneficiaries.

(ii) The socio- economic variables indicated in the study collectively contributed 42% to the variation in the adoption of ADB-CBARD recommended production practices.

(iii) ADB CBARD project intervention has impacted on beneficiaries crop output, yield, income and level of living at 1% level of probability.

6.5 Suggestions for further research

The following suggestions are offered for further study in the areas.

(i) Comparative studies should be conducted to find out the difference in yields between the improved crop varieties and the traditional varieties.

(ii) The impact of extension workers and extension programmes on the adoption of recommended crop varieties and rural livelihoods of beneficiaries in the study area.

(ii) The mechanisms of ensuring sustainability of ADB-CBARD Project in the study areas.

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DEPARTMENT OF AGRICULTURAL ECONOMICS AND RURAL SOCIOLOGY
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Research Questionnaire for Farmers on Impact of Community- based Agriculture and Rural Development Project (CBARD) on Crop Production and other Forms of Rural Livelihoods in Kaduna and Bauchi States, Nigeria.

SECTION A: BACKGROUND INFORMATION

1. Name of Farmer……..
2. Name of village……..
3. Name of Local Government Area……..
4. Beneficiary [ ], 5 Non-beneficiary [ ]…….

SECTION B: SOCIO-ECONOMIC CHARACTERISTICS OF FARMERS

6 Sex of respondent: Male [ ], Female [ ]

7 Age of respondent:…….years

8. Marital status:
   (a) Married [ ]
   (b) Single [ ]
   (c) Divorced [ ]

9. Indicate the number of dependents in your household as follows:
   (a) Wife(ves)…….
   (b) Male children 18 years and above……..
   (c) Female children 18 years and above……
   (d) Children under 18 yrs ……
   (e) Total household size……
   (f)
   Others(specify):…….

   ……..

10 Educational qualification
   (a) No formal education Yes [ ] No [ ]
   (b) Primary education ……. Years
   (c) Secondary education……. Years
   (d) Tertiary education…… years
   (e) Total years of formal education…….
   (f) Islammiya…….
   (g) Others (specify):……

11 Major occupation of the respondents
   (a) Farming [ ]
   (b) Craftwork [ ]
   (c) Civil servant [ ]
   (d) Trading [ ]
   (e) Others (specify):……..
   ……
   ……

12 How long have you been living in this village/Town?.....years

13 How long have you been practicing farming?..... years

14 Are you a beneficiary of CBARD Project? Yes [ ] No [ ]

15 How long have you been a beneficiary of the CBARD Project? ……years

16 Do you own land for agricultural production? Yes [ ] No [ ]

17 What is the tenancy status of plot(s) you cultivate?
   (a) Inheritance
   (b) Purchase
   (c) Government allocation
   (d) Gift
   (e) Lease
   (f) Rent

18 How many hectares of land do you cultivate? …….. hectare

19 Do you have contact from extension officials? Yes [ ] No [ ]

20 If yes, how many times have you had contact with extension agents last cropping season? ……..

21 Are you satisfied with the contact? Yes [ ] No [ ]

22 If yes, give reasons……

……
……

23 If no, give reasons……
……
……..

24 Do you have contact from CBARD extension agents last cropping season?
..... Yes [ ] No [ ]

25 If yes, how many times have you had contact with the CBARD extension agents last cropping season? ……..

26 Are you satisfied with the CBARD extension contact? Yes [ ] No [ ]

27 If yes, give reasons ……..
……..

28 If no, give reasons…….
…….

29 Are you a member of any farmer organizations? Yes [ ] No [ ]

30 If yes, how many associations do you belong?.....

31 How long have you been a member of cooperative associations?..... years

32 Are you a member of any cooperative organizations formed by the CBARD Project? Yes [ ] No [ ]

33 If yes, how regular do you get involved in the activities of the organization(s)?

Activities	**Regularly**	**Occasionally**	**Rarely**
Meetings			
Credit disbursement			
Field days			
Demonstrations			
Trade fair/shows			
Tours/excursion			
Trainings			
Input distribution			
Others (specify)			

34 What benefits do you derive from these organizations?
(a) Information awareness [ ]
(b) Easy access to financial assistance [ ]
(c) Provision of inputs and services at reduced cost [ ]
(d) Easy access to farm labour [ ]
(e) Others
(specify)……

35 Have you obtained any credit in the past three (3) years? Yes [ ] No [ ]

36 If yes, in what form did you receive the credit?
(a) In form of cash [ ]
(b) Inform of farm inputs [ ]
(c) Others (specify) [ ]……..

37 Indicate from which source and the amount given:
(a) Commercial bank ----------
(b) Cooperative societies ----------

(c) Friends and relatives ----------
(d) Money lender ----------
(e) Agricultural bank (NCRDB) ----------
(f) Others specify) ----------
---

38 If it is in form of input indicate the quantity ……..kg

39 What is the total amount received as subsidies from CBARD Project?..... Naira

SECTION C: LEVEL OF ADOPTION OF IMPROVED CROP VARIETIES

40 Are you aware of any improved crop varieties in your area? Yes [ ] No [ ]

41 If yes, tick from the list below the crop varieties you are aware and those you have adopted

	Recommended improved crop varieties	Awareness		Adoption	
		Yes	No	Yes	No
i	Cowpea Var.				
	1T 93K – 45				
	1T 90 K45-1				
ii	Groundnut var. Ex Dakar				
iii	Rice Var.				
	NERICA				
	FARO				
iv	Sorghum 1CSV 400				
v	Soybean Var.				
	TGX 1448-2□,				
	TGx 1740-2 □				
vi	Millet Var. SOSAT C88				
vii	Early maize Var.				
	TZ95EEW				
	TZ95EEY				
	TZ95EW				
	Striga tolerant				

	Var. Across 97				

42 What influenced the adoption of the above crop varieties?

a. High yield ( )
b. High market value ( )
c. Early maturity ( )
d. Low cost of production( )
e. Others (specify)……
……

43 Please tick in the table below based on the information provided:

		Beneficiaries			**Non Beneficiaries**		
		EA	**FA**	**NA**	**EA**	**FA**	**NA**
	Animal traction scheme						
	Motorized pump scheme						
	Tractor hiring scheme						
	Borehole/wells						
	Market						
	Social centre						
	Health clinics						
	Improved millet variety						
	Improved sorghum variety						
	Improved cowpea variety						
	Improved groundnut variety						
	Improved maize variety						
	Improved rice variety						
	Storage bin						
	Seed dressing chemical						
	Fertilizer						

EA= Easily Accessible FA= Fairly Accessible NA = Not Accessible

SECTION D: IMPACT OF CBARD PROJECT

44 What is the quantity of crops harvested from your plots last season?

		Beneficiaries			Non- Beneficiaries		
	Crops	**ha**	**Quantity (kg)**	**Cost of production**	**ha**	**Quantity (kg)**	**Cost of production**
A	Millet						
B	Sorghum						
C	Maize						
D	Cowpea						
E	Groundnut						
F	Rice						
G	Beniseed						
h	Others (specify)						
Total Unit's							

45a How much does it cost you to process the produce? .....Naira

45b How much does it cause you to transport the produce? ……. Naira

46 What is the total amount realized from the sale of crops harvested last cropping season?

	Crops	**Beneficiaries**		**Non Beneficiaries**	
A	Millet	**kg**	**Amount (Naira)**	**Kg**	**Amount (Naira)**
B	Sorghum				
C	Maize				
D	Cowpea				
E	Groundnut				
F	Rice				
G	Beniseed				
h	Others (specify)				
Total Unit's					

47 Give total income from other sources:…….. Naira

48 Is there available market for your produce? Yes [ ] No [ ]

49 How do you market your produce?

(a) Open village market [ ]
(b) Farm gate [ ]
(c) Retailers [ ]
(d) Wholesalers [ ]
(e) All of the above [ ]
(f) Others (specify):……

……

50 From the above alternatives are you satisfied with the marketing system? Yes [ ] No [ ]

51. If Yes, why? ……

52. If No, why? …….. ……..

53. How would you assess your relationship with neighbouring farmers?
    a. Satisfactory ( )
    b. Not satisfactory ( )

54 What is the average total amount spent in the household per day on the following?
(a) Feeding …….. Naira
(b) Health……. Naira
(c) Children's education…….. Naira
(d) Energy…….. Naira
(e) Entertainment…….. Naira
(f) Clothing…….. Naira
(g) Lighting…….. Naira
(h) Others (specify)…… Naira

55 Indicate the total number and current value of assets possessed as a result of your participation in the (CBARD) Project intervention?

(For Beneficiaries only)

	Assets	**Number**	**Unit/Price**	**Total value**
A	Buildings			
B	Farm equipments: Tractor Pumping machine Others (specify)			
C	Vehicles/automobiles: Car Lorry Motorcycle Others (specify)			
D	Electrical durables: Refrigerator Deep freezer Cooker Others (specify)			
E	Electronics: Radio Video CD Rechargeable lamp Satellite dish Others (specify)			

F	Farm animals: Cattle Sheep Goat Poultry Others (specify)			
Total (Naira)				

56 CBARD project has brought the following social facilities to the area:

(a) Roads [ ]
(b) Electricity [ ]
(c) School [ ]
(d) clinic [ ]
(e) Good drinking water [ ]
(f) Recreation [ ]
(g) Communication network [ ]
(h) Others
(specify)…….

57 What employment opportunities do you think CBARD project has brought in the area?

(a) Crop farming [ ]
(b) Petty trading [ ]
(c) Craftwork [ ]
(d) Brick laying [ ]
(e) Transportation [ ]
(f) Water vending [ ]
(g) Crops processing and milling [ ]
(h) Selling of fire wood [ ]
(i) Bee keeping [ ]
(j) Others (specify)……

58 How much do you earn from the following activities last year?

(a) Crop farming ₦……
(b) Petty trading ₦……
(c) Craftwork ₦……
(d) Brick laying ₦……
(e) Transportation ₦……
(f) Water vending ₦……
(g) Crops processing and milling ₦……
(h) Selling of fire wood ₦……
(i) Bee keeping ₦……
(j) Groundnut extraction ₦……
(k) Others (specify)……

59 In what ways have the CBARDP rural employment opportunities better your livelihood?

i……

ii……

iii……

iv……

60 Do you agree that CBARDP employment activities have reduced the migration of youth to the urban areas? Yes [ ] No [ ]

SECTION E: CONSTRAINTS FOR EFFECTIVE PARTICIPATION IN CBARD PROJECT ACTIVITIES

61 What problems limited your access to the infrastructure/services/goods? Tick [√]

a. inadequate infrastructure/services/goods [ ]
b. too many protocols [ ]
c. Over population [ ]
d. Poor maintenance culture of the existing facilities [ ]
e. Distance [ ]
f. Others (specify)……

…….

62 Give your opinion on the following items:

	Items	SA	A	UD	D	SD
A	There is high cost of farm inputs e.g (i) fertilizers (ii) seeds, (iii) agro-chemicals (iv) seed dressing chemicals.					
B	There is poor infrastructural facilities e.g. (i) roads (ii) recreational facilities etc (iii) water					
C	There is delay in the distribution of farm inputs e.g (i) seeds (ii) fertilizer (iii) agro-chemicals (iv) seed dressing chemicals					
D	Inadequate processing and storage facilities					
E	Inadequate capital in the form of cash					
F	Inadequate capital in the form of land					
G	Inadequate capital in the form of labour					
H	Low prices for farm produce					
I	Delay in distribution of subsidized inputs					
J	Problem of adulterated chemicals					
K	Low western literacy level					

SA= Strongly Agree A = Agree UD= Undecided D= Disagree SD= Strongly Disagree

63 What other problems do farmers encounter in the CBARD Project apart from the ones mentioned above?

……

……

……

64 What general suggestions can you give to improve farmer's participation in the CBARD Project?

……

……