ASSESSMENT OF EFFECTS OF INTERNATIONAL CENTRE FOR BIO-SALINE AGRICULTURE PROJECT ACTIVITIES ON THE LEVEL OF LIVING OF FARMERS IN KADUNA STATE, NIGERIA

BY

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DECEMBER, 2015

DECLARATION

I hereby declare that this dissertation titled **"Assessment of Effects of International Centre for Bio-Saline Agriculture Project Activities on the Level of Living of Farmers in Kaduna State, Nigeria"** was written by me and that it is a record of my own research work, except where references are made to published literature and duly acknowledged. It has not been presented before in any previous application for a higher degree.

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CERTIFICATION

This dissertation titled **"Assessment of Effects of International Centre for Bio-Saline Agriculture Project Activities on the Level of Living of Farmers in Kaduna State, Nigeria"**, by Ibrahim Jumare **SAMBO** meets the regulations governing the award of the degree of Master of Science degree in Agricultural Extension and Rural Sociology of Ahmadu Bello University, Zaria, and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

I dedicated this dissertation to the memory of my late Father Alhaji Rilwanu (Jumare) Sambo and my mother Hajiya Fatimatu (Hajiya Hari) Umar.

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ABBREVIATIONS

ABU	Ahmadu Bello University
IAR	Institute for Agricultural Research
NAERLS	National Agricultural Extension and Research Liaison Services
NAPRI	National Animal Production Research Institute
NPC	National Population Commission
ICBA	International Center for Bio-saline Agriculture
FOA	Food and Agriculture Organization
CBN	Central Bank of Nigeria
NAS	National Agricultural System
IDB	Islamic Development Bank
OPEC	Organization of Petroleum Exporting Countries
NARS	National Agricultural Research Systems
HJRVP	Hadejia Jama'are River Valley Project
HWDP	Hadejia-Nguru Wetland Development Project
MTPs	Management Training Plots
IFPRI	International Food Policy Research Institute
PPFs	Programme Participant Farmers
NPPFs	Non-Programme Participant Farmers
KG	Kilogram
KADP	Kaduna Agricultural Development Project
LGA	Local Government Area
LGAs	Local Government Areas
ODA	Official Development Assistance

ABSTRACT

This study was under taken to assess the effects of International Centre for Bio-saline Agriculture project activities on the level of living of Farmers in Kaduna State, Nigeria. The data used for this study were collected through the use of questionnaire administered to 171 respondents selected randomly from seven villages within the State. Descriptive and inferential statistics were employed to analyze the data. The results of the study revealed that the mean age of the participants was 39 years, while the non-participants mean age was 33 years. The mean household size of the participants is 9 people, while that of the non-participants is 8 people. The study further revealed 30% of the participants and 45% of the non- participants were able to secure secondary school education. The result of the study further depicted that majority (73%) of the participants had contact with the extension agents, while only 15% of the non-participants had contact with the extension agents. The study found out that majority (53%) of the participants had access to credit, while only 21% of the non-participants had access to credit. The study found that 48% of the participants had an income of ₦500, 000:00 and above, while about 31% of the non-participants fall in that category. Only about 13% of the participants had an income up to ₦100, 000:00 about 32% of the non-participants falls within same category. The analysis of the study depicted that about 88%, 85%, 83%, 82%, 80% and 80% of the participating farmers were engaged in field days, agricultural marketing, post harvest and storage, exchange visits, crop protection and livestock production activities respectively. The analysis on effects of ICBA activities on yield indicates that the calculated Z-value (1.822) was greater than the tabulated Z-value (1.64) one tail, significant at 5% probability level. This implies that, participation in ICBA activities had significant influence on yield of the farmers. The result on effects of ICBA activities on income also found out that the calculated Z- value (3.542) was greater than the tabulated Z-value (1.64) one tail, significant at 5% probability level. This implies that, participation in ICBA activities had significant influence on income of the farmers. Furthermore, the analysis on effects of ICBA activities on level of living revealed that the Z calculated (3.46) was greater than the table Z -value (1.64) one tail, significant at 5% level of probability. This implies that, participation in ICBA activities has significant influence on the farmers' level of living. The study found out that poor market especially glut in tomato and pepper marketing, high cost of Irish potato planting materials, non availability of improved pepper seeds and inadequate finance were the constraint identified against effective participation of farmers in ICBA activities in the study area. The study concluded that participation in ICBA project activities had increased the yield, income and level of living of the participating farmers within the study area more than the non-participants. It was therefore recommended that the farmers should organize themselves and set up a cottage industry for processing tomato and pepper to address the issue of poor marketing especially during glut period. Subsequently, the attention of the relevant authority such as local government or State government should be sought by the project officials for a major processing plant for the community.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Study

Agriculture is the dominant occupation of rural Nigerians and is mainly practiced under rain fed condition. It constitutes a significant sector of Nigeria's economy and has contributed immensely to its economic development. It provides food for the growing population, employment for over 65 percent of the population, raw materials and foreign exchange earnings for the development of the industrial sector and generation of household incomes for farmers (Kwage, 2006; Amaza, 2009).

Irrigated land area worldwide occupies about 16% of the total agricultural area and the crop yield of irrigated land is roughly 40% of the total yield (Sundquist, 2007). In other words, irrigated land produces 2.5 times more product than non-irrigated land. In the Arid and semi-arid areas of the world, irrigation agriculture becomes necessary either to supplement the rain fed crops with water to complete their life cycle or as dry season farming, as rainfall is often inadequate in amount and erratic in distribution. But, any addition of water from other sources to these soils, either by capillary ascent from the ground water or by irrigation, necessarily implies the addition of salts. As long as the water added locally to a soil is used entirely for consumptive use of the vegetation salinization of the soil profile is unavoidable (Yakubu, 2008).

Estimates indicate that roughly one-third of the irrigated land in the major irrigation countries is already badly affected by salinity or is expected to become so in the near

future. Present estimates for Israel are 13% of the irrigated land, Australia 20%, China 15%, Iraq 50%, Egypt 30%. Irrigation-induced salinity occurs in large and small irrigation systems alike (Stockle, 2013) also the Food and Agriculture Organization (FAO) as far back as 1977 estimated that by 1990 about 52 x 10^6 ha of irrigated land will need to have improved drainage systems installed, much of it subsurface drainage to control salinity.

In view of the stated problems the much desired food security in Nigeria can hardly be achieved without the transformation of the agricultural sector. In this regard, much can also not be achieved by the agricultural sector in terms of increased food supply without effective transfer of new technologies to the resource poor rural farmers who cultivated most of the cultivated land. Nwachukwu and Nwosu (2005) reported that if food production is to keep pace with rising population, more effective farming techniques must be introduced by persuading resource poor farmers to become more innovative. It is indeed against this back ground the intervention of International Center for Bio-saline Agriculture (ICBA) project becomes imperative. The project has in its objective the role of rekindling back to life (production) those irrigated/fadama areas that were not cultivable or production has been seriously declined due to salinity.

1.2 Problem Statement

Nigeria's agricultural productivity is declining as food production dropped by 20% at the end of the year 2007 cropping season (CBN, 2012). Therefore, the need to grow more food to meet the demands of the population in Nigeria has led to intensification of land use, especially around irrigated and fadama areas. Agricultural practices often result in a mismatch between land quality and land use leading to soil fertility decline and general

land degradation (Batjes, 2001; UNEP, 2003). The environmental costs of such mismatch are usually significant, such as water logging and the build-up of salinity and/or sodicity, depletion and pollution of groundwater and increase in pests and diseases (Hartemink, 1997; Datta and de Jong, 2002; Bationo *et al*., 2004). Worldwide, about two-thirds of all agricultural lands have been degraded to some extent within the last half century (World Resources Institute, 2000). It is also instructive to note that about 1 to 2% of irrigated land is lost annual as a result of salt-related problems, especially in arid and **semi-arid** areas (Xiao Gang *et al*., 2002; Guarnieri *et al*., 2005). In a similar related study Oldeman (1994) and FAO (2002) stated that most salt-related land degradation problems are, to a large extent, human-induced.

Scientists agree more extreme weather patterns are on the horizon. A range of forecasts predicts increased drought in some parts of Africa and flooding in others. Rising sea levels and tropical cyclones threatens small island States. Nothing can stop the march of climate change, but there is still time to temper its effects, Spore Magazine (2008). In a similar statement the spore magazine in 2010 argue that West Africa, the region with the most variable climate anywhere in the world, is also one of the most poorly endowed when it comes to irrigation systems; it has barely 8% of the continent's big dams which have a total capacity of 3 million m^3.

The perennial decline in the agricultural sector has consequently attracted attentions from experts and governments with different solutions and improvement plans to curb the relatively low performance of Nigerian agricultural sector which has been attributed to some weak components of the National Agricultural System (NAS) such as structural

dualism, uncoordinated farming system, intricate land use pattern and fiscal marginalization of the agricultural sector (Imoudu, 2005, Nsikak-Abasi and Sunday, 2013). One of such interventions is the International Center for Bio-saline Agriculture (ICBA) project. The project intends to address the problems associated with irrigation to include: water availability and quality; irrigation technologies/management; genetic diversification to improve sustainable agricultural production; seed production units of improved crops; appropriate soil, water and nutrient management practices; rural socio-economic, market linkage and value-chain development. Based on the foregoing assertion; this study provided answers to the following research questions:

i- What are the socio-economic characteristics of the participants and non-participants in the study area?

ii- What are the levels of activities introduced by ICBA to the farmers?

iii- What are the factors influencing farmers participation in ICBA activities?

iv- What are the effects of ICBA activities on yield, income and level of living of farmers?

v- What are the constraints faced by farmers participating in ICBA activities?

1.3 Objectives of the Study

The broad objective of the study was to assess the effects of International Centre for Bio-saline Agriculture project activities on the level of living of Farmers in Kaduna State. The specific objectives were to:

i- describe the socio-economic characteristics of the participants and non-participants in the study area;

ii- describe the levels of activities introduced by ICBA to the farmers;

iii- assess the factors influencing farmers' participation in ICBA activities;

iv- determine the effects of ICBA activities on yield, income and level of living of farmers;

v- identify the constraints faced by farmers participating in ICBA activities;

1.4 Justification for the Study

Agricultural production in the fadama/irrigated areas are usually faced with unique numerous problems that require interventions in order to make cultivation in such area productive and conducive. Therefore, this study would pave way in appreciating those challenges faced by the farmers and the associated input of the ICBA project to ameliorate such challenges. It is also hoped that the findings of this study being the first on the project will be of use to the project coordinators in identifying the strength and weakness of the intervention and make adjustment where necessary. Also the study would provide empirical evidences or areas for further studies.

1.5 Hypotheses

The hypotheses tested in this study were:

i- Socio –economic characteristics of respondents have no influence on the level of participation of farmers in ICBA activities.

ii- Participation in ICBA activities has no influence on farmers' yield.

iii- Participation in ICBA activities has no influence on farmers' income.

iv- Participation in ICBA activities has no influence on farmers' level of living.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 An overview on International Center for Bio-saline Agriculture (ICBA)

The International Center for Bio-saline Agriculture (ICBA) is not-for-profit, international center of excellence for research and development in marginal environments. ICBA was established in 1999 through the visionary leadership of the Islamic Development Bank (IDB), the Organization of Petroleum Exporting Countries (OPEC) Fund, the Arab Fund for Economic and Social Development and the Government of United Arab Emirates. The host country, through the Ministry of Water and Environment and the Environment Agency – Abu Dhabi extended the agreement with IDB in 2010 and increased their financial support to the Center, ICBA, (2015).

The Center originally focused on the problems of salinity and using saline water for irrigated agriculture. Over the last 13 years, ICBA has evolved into a world-class modern research facility with a team of international scientists conducting applied research to improve the well-being of poor farmers in marginal environments. In 2013, the Center developed a new strategic direction addressing the closely linked challenges of income, water, nutrition, and food security.

The new strategy takes innovation as a core principle and identifies five innovations that form the core research agenda: assessment of natural resources; climate change adaptation; crop productivity and diversification; aquaculture and bio-energy, and policy analysis. ICBA is working on a number of technology developments including the use of

conventional and non-conventional water (such as saline, treated wastewater, industrial water and seawater); water and land management technologies; remote sensing and modeling for climate change adaptation, ICBA, (2015).

The International center for Bio-saline Agriculture (ICBA) with Islamic Science Research Academy (ISRA) and seven National Agricultural Research Systems (NARS) of the Sub-Sahara Region (Burkina Faso, Gambia, Mali, Mauritania, Niger, Nigeria and Senegal) obtained a grant from Islamic Development Bank (IDB) through ICBA for implementation of project's activities to cover a four-year period (2011 - 2014). However, the financial commitment is based on annual basis depending on annual review of project's progress, achievements and receipt of funds from donor(s) ICBA, (2011).

2.2 ICBA - Nigeria Project

The National Agricultural Extension and Research Liaison Services (NAERLS) in Nigeria was responsible for providing six-monthly progress reports and an annual report of activities and results. Reports include achievements and progress made against agreed activities, results, table, graphs and photos. The report was submitted to ICBA in both hard and electronic forms to merge with ICBA's overall reports to donor(s) on the project. Similar reports are required in each year of the project's life.

In the final year a project completion report was provided within the time frame agreed upon between the project team from both institutes. The release of six-monthly payments by ICBA to NAERLS was governed by the satisfactory technical and financial reports. In

case the donor requests additional supporting documents, NAERLS comply with the requests to provide these as necessary ICBA (2011).

2.3 Socio-economic Characteristics of Farmers

The study of socio-economic characteristics of respondents is paramount in a research; this is largely due to the fact that it will help to understand the investment behaviour of the farmers on the land, social and demographic features which eventually will depicts how farmers imbibe modern techniques in agriculture. Some of the literatures documented in this study include one by Ali and Victor in 2013 where they conducted a study on assessment of socio-economic factors affecting household charcoal use in Makurdi urban area of Benue State and found out that increasing economic activities lead to increasing incomes and a better quality of life for the members of the households. Growth in population and income of the household stimulates the socio-economic transformation that moves households to more diverse and intensive use of household fuel.

However, Botlhoko and Oladele (2013) in their study titled "Factors Affecting Farmers Participation in Agricultural Projects" reported that majority of farmers are older than 55 years and constitute 60.3 % of the respondents. Also, 51.6% were males while 48.4 % were females. Oladele (2011) noted that it was a wide belief that males are dominating agricultural sector as compared to female. Although females are not left out, females put more hands on in harvesting and processing. The study further shows that majority (54.2%) of the respondents had formal education up to High school level, 15.8% had no formal education while 27.5 had primary school level of education, Oni *et al.* (2005) reported that literate farmers are likely to accept new innovation than illiterate farmers thereby enhancing

their productivity and greater farms' returns. The family size of respondents ranging between 1 and 3 was 29%, 65% ranged from 4 to 6 and the remaining 6% had above 6 persons as family size. Majority of households are headed by male of about 60 %, female headed is 21% and the remaining 15% is headed by children. This could be attributed to the menace of HIV/AIDS. The study area according to Ladzani (2005) is rated as the fifth most endemic province of nine provinces in South Africa. Similarly, socio-economic characteristics of farmers have been found to influence their level of participation in agricultural project implementation (Olufemi *et al*., 2006 and Banjol *et al*., 2003).

In another related study conducted by Idrisa et al. (2012) it depicted that about 51% of the respondents were 45 years of age or younger, with about 48.89% of the respondents above 45 years of age, indicating that a large proportion of the respondents have declining productivity. They further explained that aging populations are less able to engage in modern agricultural practices and are less able to source and synthesize information. The study also indicated that majority (78.23%) of the respondents had not gone beyond primary school level of education. Low level of educating was a major impediment in farmers' harness of intervention projects benefits. Socio-economic factors such as age, household size, formal education, income, social status, family size, social participation and frequency of extension contacts were all found to be significantly related to adoption Eneh, (2008).

Further studies on socio-economic characteristics of respondent of interest was that of Bashir in 2002 where he argues that with respect to farm size the coefficient and T-values indicated a negative and significant relationship with the output in Hadejia Jama'are River

Valley Project (HJRVP) farmers. Also in Hadejia-Nguru Wetland Development Project (HWDP) Adekunle *et al.* (2005) depicted that most farmers were male and involved in mixed farming. He also indicated that farmers belong to some category of organizations and more participants get hygienic source of water than non-participants. However, farmers participating in wetland development project had some type of formal education and not all of them are illiterate, most of the farmers fall between the ages of 35 and 45 years, Emmanuel *et al.* (2006). Moreover, Akpa (2007) asserted that the level of education attained by a farmer not only increases his/her farm productivity but also enhances ability to utilize effectively and efficiently whatever resources exist in the area.

2.4 ICBA Project Activities Introduced in the Study Area

The International Center for Bio-saline Agriculture (ICBA) project has engaged the farmers into capacity building (trainings), Management Training Plots (MTPs), Field days, Farmers exchange visits, input sourcing as well as women empowerment.

Literatures of interest in relation to capacity development include one by International Food Policy Research Institute (IFPRI) in 2008 where it argues that Strengthening local capacities and institutions remains a major challenge for the effective design and implementation of agricultural and rural development programs and policies in developing countries. Sustainable capacity development is also central to making aid work on the ground. Similarly, The World Bank's (2007) evaluation of training programmes found that 730 million United State Dollars were spent each year to build client capacity and resulted in individual participant learning, but achieved development objectives only about half the time. Making the leap from individual learning to better development outcomes and

capacity impact required both good training design and an appropriate organizational and institutional context in which to apply the learning from training.

A group of donors and academic institutions looked at capacity development and estimated that around 25% of global expenditure of Official Development Assistance (ODA) was invested every year in capacity development. A compilation of definitions of capacity-building showed that any type of learning and change activity could be included (research and development; human resource development, training for project staff, training beneficiaries, capacity-building in various sectors such as health; agriculture; environment, trade, education, etc.) Hartl, (2011).

2.5 Factors Influencing Farmers' Participation in Intervention Projects

Participation is critical, in order to come up with successful and accepted programs since they facilitate the development plans. Empowerment refers to process in which community gives or gets power from another. Participation as empowerment is an approach in which people hold complete power over and are in full control of a program. Participation refers to involvement of marginalized groups in development process, which intend to build peoples abilities to access and control of resources, benefits and opportunities towards self reliance and to better standard of living. Farmer's participation plays a vital role in economic development and in poverty alleviation.

Without participation there would be no program, no development. Lack of participation in decision-making to implement agricultural policies can lead to failure in agricultural development. There are five types of farmer's participation which are: empowerment,

partnership, interaction, consultation, informing, and manipulation. There are various reasons why active participation is very hard to achieve including people's lack of knowledge, confidence, capital, skills. Ignorance is considered as the main barrier to farmers' participation in agricultural projects. Farmers' participation in planning and decision-making, shortage of incentives to those who participate, and lack of capable organization were contributing factors to farmers' participation (Aref, 2011).

Relevant literatures buttress the factors that influence farmers' decision to accept and participate in projects activities to be of varying degree. Among such are the work of Adeoti *et al*., 2007; Fotz 2003; Shreshta and Gopalakrishnan, 1993 where they asserted that physical, natural, human, social, community and financial assets of the household are some of the factors. In a separate study Edi *et al.* (2007) argue that factors affecting farmers' participation in agric environmental measures reported that projects that provide easy access to farming inputs and are environmentally friendly and provide adequate leisure time encouraged participation.

However, Botlhoko and Oladele (2013) in their study titled "Factors Affecting Farmers Participation in Agricultural Projects in Ngaka Modiri Molema District North West Province, South Africa" found out that about 37.5% of the respondents had income of less than 10 000, 20.6% had income of 11 000-30 000, 14.9% had income of 31 000 -50 000 and 27% had an income of above 50 000, other source of income was from social grants, 45% of the respondents derive their income from social grants and majority (50%) of them have other sources of income. This shows that people are resorting to agriculture as an alternative to employment and to ensure food security. The results indicated that the

common farming enterprises in the study area were vegetables (18.3%), followed by piggery (14.3%), cattle (13.3%), maize (12.6%) then sheep (12.5%, poultry (10.8), goat (10%), and sunflower (8.3%). But, contrary to the findings of Montshwe (2008) identified livestock farming as the enterprise with the most likely chance of improving household food security and addressing poverty alleviation in the rural areas of South Africa. However, very few small scale cattle farmers participate actively in mainstream cattle markets. The figure further shows that 97 % of farmers were willing to participate in agricultural projects and also shows that only 3% were not willing. Farmers' participation is considered necessary to get community support for agricultural development projects (Cole, 2007).

The most prominent attitudinal statements are participation in projects improves adoption status (60.8%), participation enhances access to extension services (59%), participation enhances capacity building (64.2), and participation enhances agricultural development (59.2%). Ozowa (1997) revealed that extension is a type of education which is functional rather than formal whose main task is to convey information in a meaningful form to farmers. The study further indicates that 68% of farmers showed positive attitudes towards participation in projects to enhance food security; hence Letsema la mantshatlala programme where food security is ensured by providing inputs within unemployed families. About 42% agreed that participation will enhance access to land. As land is the first requirement to meet when applying for agricultural projects.

Also Cohen in 1996 noted that obstacles to community participation were identified in the attitudes and practices of the personnel of development agencies and field staff and in the

community itself. The study also indicates that 52.5% of farmers agree that participation in projects were a prerequisite for other project-related activities, 40.8% indicated that project mobilization strategy encourages farmers participation and 57.5% also indicate that farmers agree that participation enhance project sustainability and 59.2% of farmers agree that participation enhance agricultural development. It was also established that the majority of farmers; 54.2% agree that participation determining impact while 6.7% of farmers disagree that awareness increase government popularity.

2.6 Effects of Intervention Projects Activities on Yield, Income and Level of Living of Farmers

Effects refer to a change or changed state occurring as a direct result of action by somebody or something else, among such could be an intervention project like the ICBA.

2.6.1 Effects of intervention projects activities on farmers' yield

In another related separate study undertaken by Okeh, (2010) it was reported that there was a difference between Programme Participant Farmers (PPFs) and Non-Programme Participant Farmers (NPPFs) in production capabilities (crop yields) and marketing capabilities in Plateau State where statistically difference stood at 5% level of probability. Further, the study affirmed that income by programme participant farmers and non-programme participant farmers was significant difference at 5 % level of probability. But Yusuf (2010) reported that gross return per 112.5kg (one bag) of groundnut oil processing using improved technologies was ₦18,900:00 on the average, while the average gross margin of 112.5kg (one bag) of groundnut oil processing using traditional technologies was ₦ 5,300:00 among respondent women in Kaduna State.

Furthermore, Akintunde in 2010 studied the comparative economic evaluation of improved and local varieties of cowpea seed use in Local Government Areas of Kaduna State and reported that gross margin analysis showed that the average rate of return (ARR) of ₦10:00 for improved variety was realized while it was ₦4.6k for the local variety.

2.6.2 Effects of intervention projects activities on farmers' income

Literatures of prominence to this area of study buttressed that income is an important factor in establishing the farmers' disposition to adopt an innovation, according to Ojo (2009), about 66.67% of the respondents claimed to earn between ₦19, 000 – ₦69, 999 and 43.33% of the respondents earned above ₦69, 000. This implies that very few respondents probably obtained good financial returns from the adoption of the innovation which contradicts the findings by Inusa (2011).

2.6.3 Effects of intervention projects activities on farmers' level of living

Literatures of prominence to this area of study buttressed that level of living is the quantity of goods and services actually consumed by an individual and his family, (Ekong, 2003). This includes items such as radio, television, refrigerator, cooker, eating balanced regular meals, wearing good cloths, living in decent house and surroundings, owing some means of transportation and animals owned by an individual, (Atala, 1980, Ekong, 2003).

2.7 Overview of Constraints in Executing Intervention Projects

Constraints are associated to all spheres of life; however, those related to this study are as asserted by Ekong in 2003 where he reported that barriers to implementation of diffused innovations are relative advantage, cost, complexity, divisibility and compatibility. But

Morardet et al., 2005 and Arokoyo, 1995 in separate studies identified inappropriate technology, lack of understanding of the socio-economic and socio-cultural elements of the communities or participants by project implementers, lack of appropriate institutional frame work and linkages between the government's agencies and research institutes charged with the responsibilities for management and implementation of agricultural policies and programmes as hindrance in the transfer of many technologies to farmers practicing irrigation.

However, Nxumalo and Oladele (2013), in their study titled "Factors Affecting Farmers' Participation in Agricultural Programme" revealed that constraints to farmers' participation in agricultural projects are unavailability of land, lack of resources, and lack of funds which were 81.1%, 92.2%, and 93.3% respectively. The inequality and injustice of the apartheid era on land ownership could be responsible for this trend of results. Closely related to this is the inaccessibility to market and the monopoly of market and value-chain processes that have been operational since apartheid regime. Lahiff (2007) stated that everyone did benefit from land reform program. This result also supports Mwangwela and Düvel (2010) who stated that inadequate resources by services providers are one of the barriers to participation in agricultural projects. Mpandeli et al. (2008) also found that lack of resources was one of the major constraints facing farming community.

In a similar research titled "Factors Affecting Farmers' Participation in Agricultural Programme in Zululand District, Kwazulu Natal Province, South Africa" by Botlhoko and Oladele (2013) asserted that the most important constraint is lack of market access (68%), which is followed by land unavailability (75%), lack of resources (65%), lack of technical

knowledge (60%) and high inputs costs (60.8%). These are essential support services needed by farmers and new entrants to farming. However, farmers indicated that lack of sense of ownership (50%) is the least severe constraint. Moagi and Oladele (2012) reported that farmers in Waterberg District, Limpopo Province, South Africa have high information needs particularly in the areas of agricultural inputs, production, market and supply chain and, credit.

Moreover, Gumwa and Idi *et al.* (2006) also in separate studies asserted that lack of logistics, shortage of qualified extension staff, lack of coordination within the implementers and other relevant government agencies and the participants, lack of flexibility in the programme design, lack of funds as well as duplication of efforts to be among the major constraints in projects execution.

In similar separate studies Makusidi (2014) and Orji (2014) stated that constraints to effective participation of farmers were inadequate planting materials and farm input (93.1%), inadequate finance and credit facilities (89.9%) and high cost of farm input (89.4%), while the former attested that inadequate capital (96.665%), inadequate irrigated land (94.44%), pests and diseases (93.33%) and quilea birds invasion (92.22%) to be among the most prevalent constraints among the respondents. These were contained in their researches titled "impact of tungan-kawo dam irrigation project on rice production and livelihoods of small holder farmers in Wushishi local government area, Niger State" and "socio-economic factors influencing farmers' attitude and participation in community based agricultural and rural development programme in Zaria and Sabon-gari local government areas, Kaduna state, Nigeria" respectively.

2.8 Theoretical Framework

Theoretical framework as defined by Ekong in 2003 is referred to a broad system of explanation that is founded not so much on prior research findings but largely on interest and perhaps improvable assumptions about realities. Theory construction in social sciences has several objectives; (i) it provides conceptual framework to facilitate the accurate observation and reliable description of social event, (ii) it formulates laws and theories by which social phenomena can be explained (iii) it establishes a foundation of knowledge and methodology that under certain conditions makes possible the control of social affairs. Therefore, this study will be guided by the concepts of Intervention and Participation.

2.8.1 Concept of Intervention

Intervention concept is a term used in social studies and social policy to refer to the decision making problems of intervening effectively in a situation in order to secure desired outcomes. Intervention concept addresses the question of when it is desirable not to intervene and when it is appropriate to do so. It also examines the effectiveness of different types of interventions. The term is used across a range of social and medical practices, including health care, child protection and law enforcement; it is also used in business studies, Wikipedia (2015).

It is also worth noting that within the theory of nursing, intervention concept is included within a larger scope of practice concepts. As Burns and Grove (2007) point out that it directs the implementation of a specific nursing intervention and provides theoretical explanations of how and why the intervention is effective in addressing a particular patient

care problem. These concepts are tested through programs of research to validate the effectiveness of the intervention in addressing the problem.

In Intervention concept and Method Chris Argyris in 1970 argues that in organization development, effective intervention depends on appropriate and useful knowledge that offers a range of clearly defined choices and that the target should be for as many people as possible to be committed to the option chosen and to feel responsibility for it. Overall, interventions should generate a situation in which actors believe that they are working to internal rather than external influences on decisions.

2.8.2 Concept of Participation

Participation has (again) become one of the key concepts of communication and media studies, especially after the popularization of web 2.0. At the same time, the concept of participation has a long history, where especially in the 1960s and 1970s the debates about participation were omnipresent in a wide variety of societal fields. This has caused this concept to feature in a surprising variety of frameworks, which have been transformed through an almost infinite number of materializations. But the problems that characterize (the use of) participation have not disappeared, on the contrary.

Already in 1970, Pateman wrote “the widespread use of the term participation has tended to mean that any precise, meaningful content has almost disappeared; ‘participation’ is used to refer to a wide variety of different situations by different people”, and this situation has not altered. In communication and media studies, but also in many other fields and disciplines, participation is still used to mean everything and nothing remains structurally under

theorized and its intrinsically political nature as part of a democratic ideological struggle on the democratic nature of democracy remains unacknowledged.

Participation, in the development context, is a process through which all members of a community or organization are involved in and have influence on decisions related to development activities that will affect them. That implies that development projects will address those community or group needs on which members have chosen to focus, and that all phases of the development process will be characterized by active involvement of community or organization members. Through the 1990s, additional emphasis has been placed on community involvement in planning, decision-making and evaluation (Mitchell 1999, Sharma and Deepak, 2001). It has also been recognized that Community Based Rehabilitation (CBR) partnerships can utilize resources in the community to reach larger numbers of persons with disabilities (Lang, 2000).

The World Bank's reasons for community participation are: 1. Local people have a great amount of experience and insight into what works, what does not work and why. 2. Involving local people in planning projects can increase their commitment to the project. 3. Involving local people can help them to develop technical and managerial skills and thereby increase their opportunities for employment. 4. Involving local people helps to increase the resources available for the programme. 5. Involving local people is a way to bring about 'social learning' for both planners and beneficiaries. 'Social learning' means the development of partnerships between professionals and local people, in which, each group learns from the other (World Bank, 1996).

2.9 The Conceptual Model

The term conceptual model may be used to refer to model which is formed after a conceptualization (generalization) process in the mind. Conceptual models represent human intentions or semantics. Conceptualization from observation of physical existence and conceptual modeling are the necessary means that humans employ to think and solve problems wikipaedia (2015). However, Ekong in 2003 established that conceptual model, as abroad system of explanation that is founded not so much on prior research finding but largely on untested and perhaps un-provable assumptions, while a model is a construction that shows relations existing among variables.

In another similar citation by Igbokwe in 2011 asserted that a model is a general conception of a phenomenon (in this instance, society) in which a scientist works, based on his observations and existing facts. It acts as a guide in scientific investigation. However, a model may consist of more than one theory, and a powerful and testable theory may transform to become the general model. Most sociological works are guided by models, which gave them an orientation and perspective.

Therefore, the model for this study assumed that farmers' socio-economic characteristics, institutional variables and project attributes had significantly influenced their participation in ICBA project activities that brought about changes in their level of living as shown in figure 1 below:

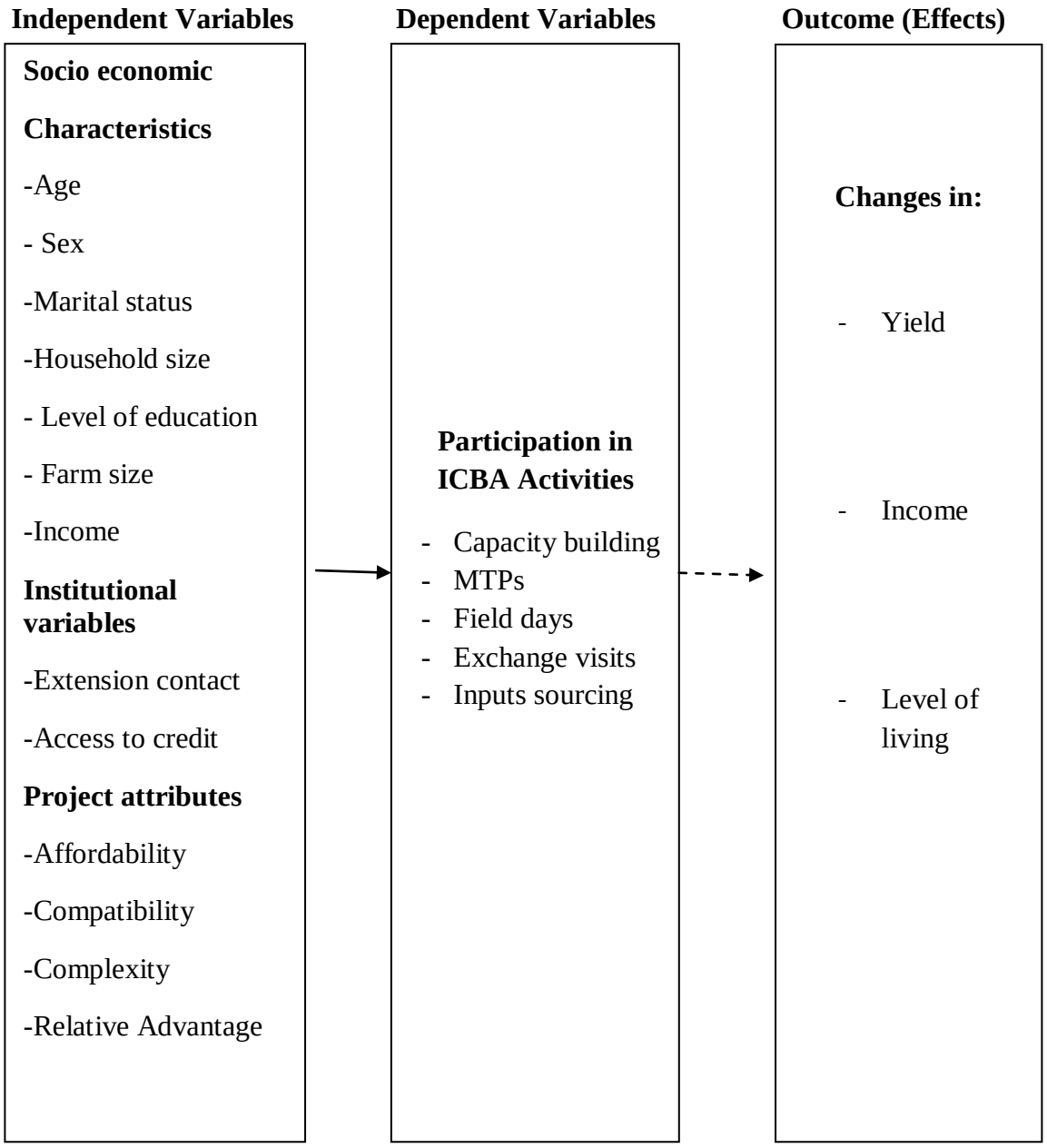


Figure 2.1 Conceptual model showing socio-economic factors influencing farmers' participation in ICBA activities

CHAPTER THREE

3.0 METHODOLOGY

3.1 Description of the Study Area

The study was conducted in Kaduna State, the State occupies the central portion of Northern Nigeria, it lies between Latitude 11^0 32' and 09^0 02' North of the Equator and 80^0 50' and 06^0 15' East of Prime Meridian and home to 23 Local Government Areas (LGAs). The State shares common borders to the North with Kano, Katsina and Zamfara, to the West with Niger, to the East with Plateau and Bauchi, to the South with Nasarawa States and Abuja the Federal Capital Territory. The State occupies an area of approximately 48, 473.2 square kilometers with an estimated projected population of 7, 909, 544 people in 2014 (3.2% growth rate per annum) from the 2006 census record of 6, 113, 503 makes it the 3rd most populous State in the Federation. The State also has 480, 000 farm families (KADP 2006). The entire land structure consists of an undulating plateau with major rivers to include Kaduna, Matsirga (Wonderful), Kogon, Gurara and Galma, all of these-provide opportunities for irrigation and fish farming.

The State has two distinct seasons, the dry season and rainy season. The temperature is hot during the dry season and cools during the rainy season, from November to February the cold dry hamattan wind blows across the State, the Northern part of the State being affected most. The mean annual temperature varies between 24^0C and 27^0C. The Southern part of the State enjoys higher rainfall with an average of 1, 524mm than the Northern part which has an average of 1, 016mm; lasting between 5-6 months in the Southern part and 4-5

months in the Northern part of the State. Generally the rains start in April and end in October.

The State extends from tropical grassland (savannah) in the South to Sudan Savannah in the North. The Savannah region of the State covers the Southern part stretching to Gwantu, South of Kafanchan with prevailing vegetation of tall trees. The Sudan or Sahel Savannah covers the Northern part of the State, stretching from Zaria down to Ikara and its environs. The life of the people of the State has been greatly influenced by this geographical setting. The two climatic conditions in the State greatly influence activities of the people, thus the people are predominantly occupied in agriculture during the rainy season which lasts for about six months from May to October, while they engage in irrigation farming, hunting and petty trading during the dry season (Kaduna State Government, 2014).

Kaduna State has over 60 ethnic groups. Major languages spoken in the State include Hausa, Fulani, Gbagyi, Bajju, Atyap, Jaba, Koro, Kaninkon, Adara, Chawai, Atakar, Gure, Ikulu, Kurama, Kagoma, Kahugu, Kagoro, Maro'a, Numana, Gwandara and many more. Like other parts of Nigeria, English is spoken as the official language, while Hausa is widely spoken which makes it a Lingua-franca in the State.

The State has vast expanse of fertile land growing both food and cash crops like rice, cassava, ginger, potatoes, millet, groundnut, shea-nut, benni-seed and soya beans aside from animal husbandry. In the northern part, the soil is good for production of large quantities of cotton lint and seed for which Soba, Makarfi, Kudan, lkara, Kubau, Kauru and Lere LGAs are known. Yam and maize have successfully been producing high yields with

the use of fertiliser in recent times, especially in Igabi, Giwa and Bimin Gwari LGAs. In the well watered southeastern part, the rich darker soils are used for cultivating cereals, cassava and the famous Southern Kaduna ginger ("Chitta" in Hausa). In the fadamas, the dark grey clay soils (vertisols) have become highly valued and are focused on for intensive agricultural activities especially during the dry season. Large areas of such fadamas are being used for economically valuable market gardening for growing tomatoes, chillies, sweet pepper, okra, onion, Irish potato and sugar cane using traditional "shadoof" irrigation (in the flood plains/fadama of Galma and Tubo basins). Agriculture accounts for an estimated 56 percent of Kaduna GDP and employs approximately 4 million in the State. The State trades' agricultural produce to neighboring States earlier indicated above (KADP, 2007).

With a vibrant, highly educated and industrious manpower, Kaduna State is a fertile ground for investment especially in agriculture, agro-allied ventures. Kaduna city is a major centre for thriving manufacturing and service industrial activity. Kaduna State is blessed with abundant mineral resources such as molbite, aquamarine sapphires, and gold. Kaduna State has huge deposits of mineral resources like Gold, Kaolin, Columbite, Aquamarine and Sapphire to mention a few that exist in the 23 Local Government Areas.

The people of Kaduna State are highly religious; the major religions in the State are Islam and Christianity, with Islam predominantly practiced in northern part and Christianity in the southern part. Traditional religion is still practiced in some areas within the State side by side, the two orthodox religions. Cultural activities include: The Eid-El-Fitr and Eid-El-Kabir Festivals, the Tuk Ham, the Afan the Christmas and Easter Celebrations as well as

the Kallan-Kowa celebrations. Other similar but less pronounced are the Tuk-Gwong, the Baranzan (Bajju), the Bakulu (Ikulu), the Anglian (Kamantan), the Adara (Kadara), the Aninkon (Kaninko), the Moroa, the Ninzo, the Kataf and the Attakad. Most of them take place at the beginning of the year in January with a few at the end of the year. (www.ramalanyero.com/Kaduna, 2014).

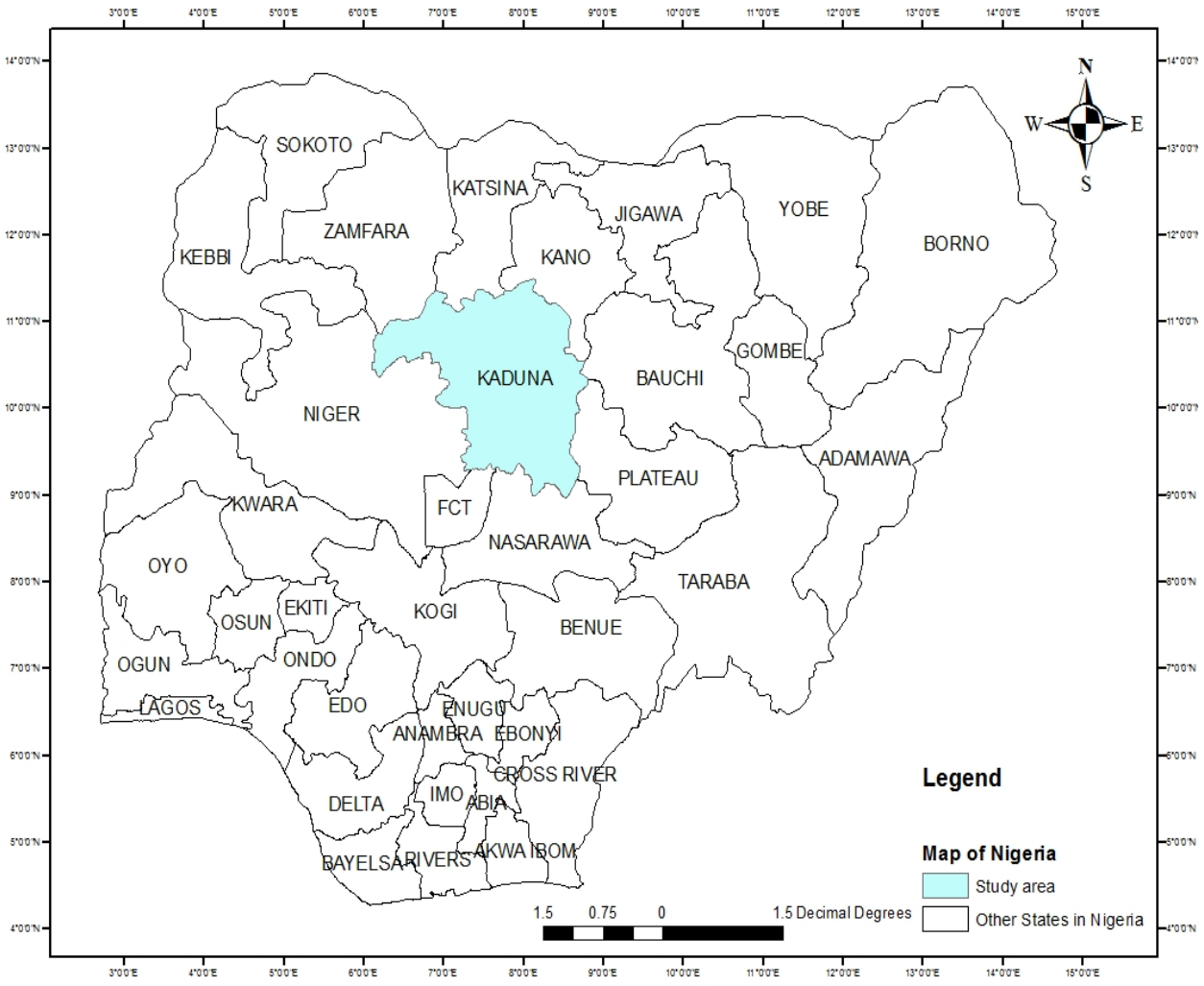


Fig 3.1 Map of Nigeria showing the study area

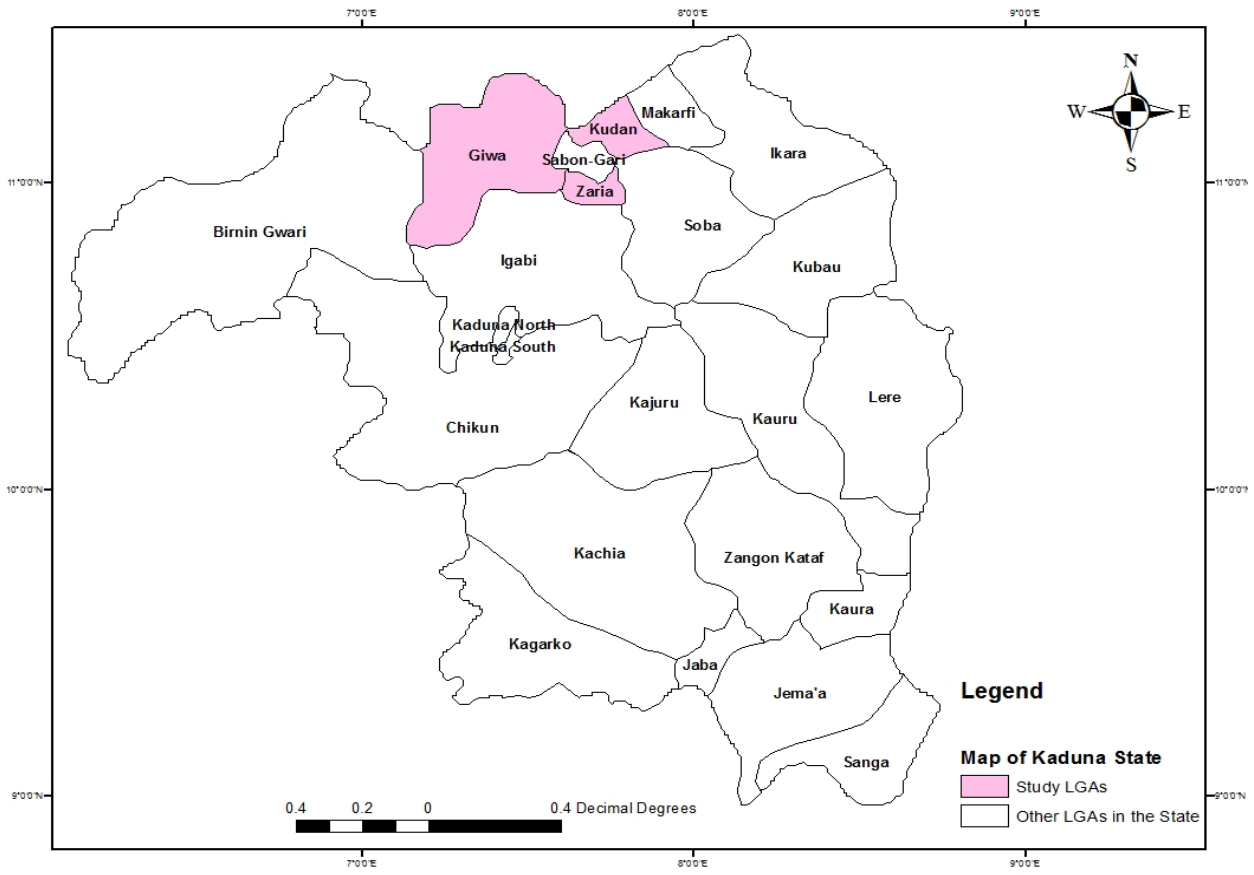


Fig 3.2 Map of Kaduna State showing the study area

3.2 Sampling Procedure and Sample Size

Multi-stage sampling technique was employed for this study. In the first stage three Local Government Areas (LGAs) namely Zaria, Giwa and Kudan were purposively selected because they were the only pioneer LGAs covered by the activities of ICBA out of the twenty three LGAs in the State. At the second stage, purposive samplings of all the sixty (60) participating farmers from the seven villages where ICBA conduct its activities were selected. The selected villages were Hayin gada, Hayin malam, Birnin bakko, Galma, Bizara, and Taban sani. Thirdly, a purposive sampling of seven non-participating villages was conducted, to serve as control. A list of farmers from the seven non-participating villages was collected as sample frame. This sample frame consist of one thousand one

hundred and ten (1, 110) farmers, then a random sampling technique was employed and 10% of the sample frame was selected, that is a total of one hundred and eleven (111) non-participating farmers. Therefore, this gives a total of one hundred and seventy one (171) respondents for this study.

Table 3.1 Distribution of respondents in the study area

S/No.	LGA	ICBA Villages	Participants	Non participants sample frame	Non participants
1	Giwa	Hayin gada	10	210	21
		Hayin mallam	10	160	16
		Birnin bakko	10	200	20
2	Zaria	Galma	10	120	12
		Dakache	10	90	9
		Bizara	5	140	14
3	Kudan	Taban sani	5	190	19
	Total		**60**	**1110**	**111**

3.3 Data Collection Techniques

Data were collected by interview schedules using structured questionnaire. The primary data collected included socio-economic characteristics of the group members such as: age, sex, marital status, family size, education level, income, expenditure, years of farming experience, experience, group meetings, group contribution, group input purchase, access to credit, frequency of extension contacts, and membership of co-operative.

3.4 Analytical Techniques

Descriptive and inferential statistical tools were used to analyze the data. Descriptive statistics such as frequencies, percentages, means and standard deviations were employed to achieve objectives i, ii and v. In order to achieve objective iii and to test hypothesis i

multiple regression was employed. To achieve objective iv and to test hypotheses ii, iii and iv Z-test was employed. The multiple model is specified as:

$Y=a+b_1X_1+b_2X_2+b_3x_3$----------$+b_{13X13}+u$ ---------- (1)

Where:

Y = Level of participation in ICBA activities (Capacity building, MTPs, Field days, Exchange visits, and Inputs sourcing).

X_1= Age (in years)

X_2= Sex (Male=1, female= 2)

X_3= Marital status (Married=1, Single=2)

X_4= Household size (number of people in household)

X_5= Educational level (number of years schooling)

X_6= Farm size (in hectares)

$X_{7=}$ Income (amount in naira)

X_8= Extension contact (Yes=1, No=0)

X_9= Amount of credit accessed (in naira)

X_{10}= Affordability (Highly affordable=5, affordable =4, undecided=3 Not affordable=2 and highly un-affordable =1)

X_{11}= Compatibility (Strongly agree=5, agree=4, undecided=3, disagree=2 and strongly disagree=1)

X_{12}= Complexity (Strongly agree=5, agree=4, undecided=3, disagree=2 and strongly disagree=1)

X_{13}= Relative advantage (Strongly agree=5, agree=4, undecided=3, disagree=2 and strongly disagree=1)

a = constant

$b_1 - b_{12}$ =régression coefficients

U = error term

The Z-test model is specified as:

Z – test statistic was used to determine the effects of the project on the level of living of farmers in the study area. The Z-test statistic was used to compare the mean values of the level of living of the participating farmers and non participating farmers in the study area. The comparison provided a statistic for evaluating whether the difference between the two mean was statistically significant or not, using the "participant and non participant" concept and at the same time to test the hypothesis that there is no significant effects of ICBA project activities have on the yield, income and level of living of participating farmers. This was represented by the formular:

The Z-test $= \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{S^2 1 + S^2 2}{n_1 + n_2}}}$ ---------- (2)

Where:

$\bar{x}_1$ = Mean of ICBA participants.

$\bar{x}_2$ = Mean of ICBA non participants.

S_1^2 = Standard deviation of ICBA participants.

S_2^2 = Standard deviation of ICBA non participants.

n_1 = Sample size of ICBA participants.

n_2 = Sample size of ICBA non participants.

3.5 Definition and Measurement of Variables

3.5.1 Independent variables

Age: This is the number of years an individual has lived. It was measured in terms of actual years of the respondent. Age has been found to facilitate or inhibit the adoption of innovations.

Sex: This entailed whether the respondents are male or female. (Male=1, Female=2)

Household size: Means the total number of people living under the care of the respondents at the time of the study. According to (Atala, 1980), in most societies the size of family is usually related to the socio-economic status of the family head.

Educational level: This refers to the number of years a respondent spent in schooling. This was in terms of: the total number i.e. 6, 9, 12 and 16 years of schooling.

Extension contact: In this study, extension contact refers to the frequency of visits by front-line extension agents to the respondents and vice versa. This was measured by the number of visits the farmers received or vice versa in the year 2014.

Access to credit: Access to credit helps in financing the execution of innovations or technology, lack of credit, inadequacy of credit or un-timeliness may affect farmers' execution of improved agricultural practices. Access to credit was measured in naira as per credit obtained.

Farm size: In this study, farm size refers to the size of farm cultivated by the respondents and was measured in hectares.

Income: This refers to the amount of money realized from farmer's production in 2014, which was measured in naira (₦).

Affordability: This refers to the extent to which the technology is affordable by the farmers. 5 point Likert scale was used: highly affordable=5, affordable =4, undecided=3 Not affordable=2 and highly un-affordable =1

Compatibility: This refers to the degree to which a new practice meets the existing values and need of the respondents. 5 –point Likert scale (strongly agree=5, agree=4, undecided=3, disagree=2 and strongly disagree=1) was used to measure the degree of compatibility.

Complexity: This means the degree to which new innovation or a technology is relatively difficult to use or understand. This degree of complexity was measured by using 5 –point Likert scale: Strongly agree=5, agree=4, undecided=3, disagree=2 and strongly disagree=1.

Relative advantage: This means the degree to which new innovations or a technology provided by the project was beneficial to the people practicing it. The degree of relative advantage was measured by using 5 –point Likert scale: Strongly agree=5, agree=4, undecided=3, disagree=2 and strongly disagree=1.

3.5.2 Dependent variable

The ICBA activities are the dependent variables. A participating farmer is a farmer that was involved in any of the ICBA activities usually on a continuous basis. A respondent who reported that he uses a particular practice on continuous basis was asked to explain the level of usage.

In order to determine if a farmer is a participant, it should be established that a farmer was involved in the ICBA activities, therefore was labeled a participating farmer.

3.5.3 Outcome

Yield: It refers to the total produce harvested by the farmer measured in kilograms and divided by the total hactarage of land in 2014 farming season (kg/ha).

Income: This is the sum of money realized by the farmer in 2014; this was calculated in Naira (₦).

Level of Living: In this study level of living refers to all things contributing to the quality of human life (durable goods, farming equipment and livestock). Therefore, level of living was measured by the value of durable goods, livestock as well as farm equipment in the possession of an individual respondent. The durable goods considered were: Horse /donkey cart, radio, Watch, bicycle, Dug water well, Water tanker, pick-up/bus, Mobile phone, Tape recorder, and motor cycle. The livestock was: Oxen and young bulls, cow and heifers, sheep, goat, horse mule, donkey, chicken and bee hive. While farm equipments were Chemical sprayer, Grain storage built (modern), Pit (site) for compost making, ox-plough and hand plough, hand hoe and tractor.

Respondents were asked to indicate the price of each item at the time of the interview and whether item can be sold to obtain real monetary value. Amount of all items was summed up and added to form individual income, which was measured in Naira (₦) in order to get the individual respondent's level of living.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Socio-economic Characteristics of ICBA Participants and Non-participants

4.1.1 Age distribution

As depicted in Table 4.1, the study found that the mean age of the participants was 39 years, while the non-participants mean age is 33 years. This indicated that both group of respondents were relatively youthful age. This implies that farmers at this age bracket could have better understanding of new production practices introduced to them. This finding agrees with the findings of Gareux (2003), who stated that younger farmers tend to be more willing to participate and adopt innovations than their older counterparts. In another related study Elias, et, *al.* in 2013 in their study Effect of Agricultural Extension Program on Smallholders' Farm Productivity: Evidence from Three Peasant Associations in the Highlands of Ethiopia depicted that as age increases farm productivity decreases. This could be attributed to the reason that getting older might pose disadvantages in agriculture because most of the work is physically demanding and also because older household heads might be too conservative to try new and more efficient techniques that could help to increase farm productivity. This study is consistent with the findings of GulUnal (2008) and Dong, Lu, and Featherstone (2010).

Table 4.1.1 Socio-economic characteristics of ICBA participants and non-participants

	Participants			Non-participants		
Characteristics	**Freq**	**%**	**Mean**	**Freq**	**%**	**Mean**
Age						
<20	2	3.3	39.47	14	12.6	33.18
21 - 29	14	23.3		31	27.9	
30 - 39	14	23.3		28	25.2	
40 - 49	15	25.0		27	24.3	
50 - 59	9	15.0		9	8.1	
60>	6	10.0		2	1.8	
Household size						
1 - 8	29	48.3	9.33	71	64.0	7.70
9 - 16	22	36.7		29	26.1	
17 - 24	8	13.3		10	9.0	
25 - 32	1	1.7		1	.9	
Educational level						
Tertiary	6	10.0		4	3.6	
Secondary	18	30.0		50	45.0	
Primary	15	25.0		26	23.4	
Technical/Vocational	-	-		5	4.5	
Read and Write Only	9	15.0		9	8.1	
Qur'anic	12	20.0		17	15.3	
Extension contact						
No	16	26.7		94	84.6	
Yes	44	73.3		17	15.4	
Access to credit						
No	28	46.6		87	78.8	
Yes	32	53.4		24	21.2	
Farm size (ha)						
0.1 – 5	40	66.4	5.34	85	76.5	4.50
6 – 10	15	24.9		17	15.3	
11 – 15	2	3.3		7	6.3	
16 – 20	2	3.3		2	1.8	
>20	1	1.7		-		
Income (000)						
1 – 100,	8	13.3	649.66	35	31.5	642.66
101 – 200	12	19.3		16	14.4	
201 – 300	3	5.0		7	6.3	
301 – 400	5	8.3		12	10.8	
401 – 500	3	5.0		7	6.3	
>500	29	48.1		54	30.6	

4.1.2 Sex

The sex distribution for both the participants and non- participants in Table 4.1 shows that all the respondents are males. This study is agrees with the works of Sen, 1990a and b; World Bank, FAO, and IFAD 2008 where they asserted that women play an important role in agriculture, particularly in Africa, but this role often goes unrecognized due to perception bias. The perception of the roles that men and women play in agriculture is biased toward men, and as a consequence, perceptions about the need for rural services are biased toward men as well.

The result also supported the work of Kunene and Fossey (2006), in which they reported that there are more men than women who were involved in farming activity in Zulu land. This shows that majority of people in Zululand districts still believes that agriculture is for male individuals and Women are expected to perform domestic activities in the household. Hence, they are not given the same opportunity as men to participate in agricultural Project. This finding further agrees with Beyene (2008), who found that agricultural projects were mostly dominated by men.

4.1.3 Marital status

The result in Table 4.1 also found out that all the respondents were married. This finding is in agreement with Abgamu *et al. (*1996) who found out that married farmers adopted new varieties of maize and cassava more than farmers that are single. Similarly, the result is a confirmation that in Africa where farming is subsistence in nature, farmers are mostly supported by family labour (Ekong, 2003).

4.1.4 Household size

The result in table 4.1 also revealed that the mean household size of the participants is 9 people, while that of the non-participants is 8 people. This shows that most of the respondents had more hands that could be use in farming activities. This finding agrees with the findings of Chiana and Tsuji (2004), that reported that large family size are more likely to adopt some soil improvement technology due to sufficient labour.

4.1.5 Educational level

The result of the study (Table 4.1) found that 10 % of the participants and 3% of the non-participants have tertiary education. Furthermore, the result shows that about 30% and 45% of the non- participants were able to secure secondary school education. These findings agrees with the work of Botlhoko, G. J. and Oladele, O. I. (2013), which shows that majority (54.2%) of the respondents in the study "Factors Affecting Farmers Participation in Agricultural Projects in Ngaka Modiri Molema District North West Province, South Africa" had formal education up to High school level, 15.8% had no formal education while 27.5 had primary school level of education. Oni *et al.* in 2005 also reported that literate farmers are likely to accept new innovation than illiterate farmers thereby enhancing their productivity and greater farms' returns.

However, this finding contradicts the works of (Alene & Manyong, 2007; Gebremedhin et al., 2009), where they asserted that despite the importance of education in increasing farm productivity but surprisingly its effect was negatively significant. This could be partly attributed to the fact that educated farmers are involved in non-agricultural related activities (e.g. kebele administration in this study context), which would consume much of their

farming time. However this is a tentative hypothesis to explain the unexpected result and needs further empirical study.

4.1.6 Frequency of extension contacts

The result of the study in table 4.1 further depicted that majority (about 73%) of the participants had contact with the project's extension agents, while only about 15% of the non-participants had such contact with the extension agents. The implication of this is that the participants are more likely to be abreast with current and regular information about farming activities.

The result is supported by the work of Dvorak (1996) who reported that contact with extension agents enable farmers to obtain information on improved agricultural technology. The results are also in consistent with the findings of Opara (2008), who found that majority of the farmers (88.2%) preferred the extension agent to the other sources of information. Also Ozowa (1997) noted that extension is a type of education which is functional rather than formal whose main task is to convey information in a meaningful form to farmers. However, Mohammed et al. (2005) stated that farmers' main sources of information vary according to enterprise type. For their production decisions, for example, poultry and dairy farmer respondents depend largely on information provided by veterinarians while horticulture and crop farmers rely mainly on the advice of extension agents.

4.1.7 Access to credit

The result also found that majority 53% of the participants had access to credit, while only about 21% of the non-participants had access to credit. This could be attributed to the project activities that linked the participants to credit facilities providers. This finding agrees with the work of Mwangi and Ouma (2012), which found that Credit markets in developing countries, especially in Africa including Kenya have evolved mechanisms that circumvent such credit constraints. Borrowers, who are poor in collateral assets and for whom lenders have poor information about their creditworthiness have resorted to the use of social capital to improve their accessibility to credit. The finding also conformed to the work of Aryeetey (2005), where he stated that Group membership is an essential tool for screening loan applications and for ensuring that contracts can be enforced.

4.1.8 Farm size

The study shows that 66% of the participants had farm sizes that did not exceed five hacters and about 77% of the non- participants fall within this category. The result also indicated that 25% of the participants and 15% of the non- participants had farm sizes between 6 – 10 hectares. Only about 2% of the participants have farm sizes that exceed 20 hectares. This implies that most of the respondents are small scale farmers.

This finding contradict the work of Botlhoko, G. J. and Oladele, O. I. (2013) research titled "Factors Affecting Farmers' Participation in Agricultural Programme in Zululand District, Kwazulu Natal Province, South Africa" where they reported that 56.6% of respondents had farm size of less than 50 ha, 5.8% had between 50-100 ha, and 37.6% had between 100-150

ha. However, Kinsey (1999) reported that the farm size had no effect on greater returns on production. Also Rosset (2000) in a similar study reports that small farms produce far more per acre or hectare than large farms. One reason for the low levels of production on large farms is that they tend to be monocultures. But, Sharma et al. (1999), Lundvall and Battese (2000), and Alvarez and Arias (2004), who have all reported a positive relation between average land productivity and land size, asserted that Plot size is positively significant with farm productivity. An increase in plot size by one hectare could increase yield by about 0.073%.

4.1.9 Income

The result of the study found that about 48% of the participants had an income of N500, 000:00 and above, while about 31% of the non-participants fall in that category. Then only about 13% of the participants had an income up to N100, 000:00, about 32% of the non-participants falls within same category.

This finding implies that participation in ICBA activities has effects on the income of the participants more than the non-participants. This finding agrees with the work of Barret (2008), where he reported that the most important factor in stimulating environmental participation would be providing opportunities to increase income, utilize and benefit from the forest.

4.2 Level of Participation in ICBA Activities Introduced to Farmers in the Study Area

The result of the study in figure 4.1 revealed that all the participating farmers were able to undertake one form of activity or the other, but only 20% of the non participants were able

to participate in crop production, livestock production, irrigation management, soil and water conservation management, agricultural marketing, crop protection, post harvest and storage, exchange visits and field days activities of the ICBA project.

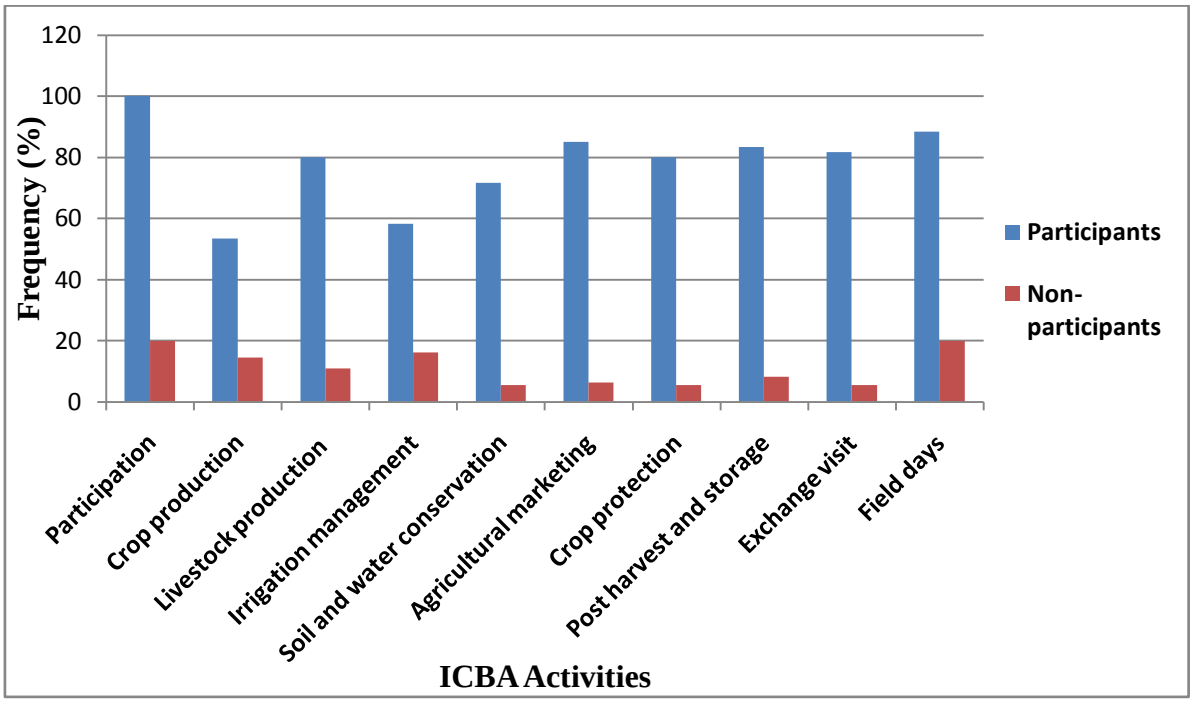


Figure 4.1 Level of participation in ICBA activities introduced to the farmers

As depicted by the result on figure 4.1 majority (88%) of the participating farmers were able to attend field days organized by the ICBA project officials, while only 20% of the non-participants were able to attend such field days. The study also revealed that majority (85%) of the participating farmers was engaged in agricultural marketing aspect of the intervention, while only 6% of the non- participants were able to do so.

The result of the analysis on figure 4.1 further revealed that 83%, of the participating farmers was engaged in post harvest and storage aspect of the intervention, while only 8%

of the non- participants were able to do so. On the aspect exchange visits 82% of the participating farmers was engaged, while only 5% of the non- participants were engaged. The result also indicated that 80% of the participants were involved in crop production activities, while 5% of the non- participants were involved in the same activity. It was also found that 80% of the participating farmers were engaged in livestock production activities of the project, while 10 of the non-participants were involved on livestock production activities.

Although, the finding depicted low levels of participation by the non-participants as was envisaged, but at the same time it has also bring out the levels of diffusion of the ICBA project activities in other communities.

These findings agree with the work of Ayode (2010) who reported that participation is contingent on benefits derived from the project. The findings also confirmed the work of Salam *et al*. (2005), where they reported that farmers' participation in forestry projects was due to participants' knowledge, skills, claims and assurance of long-term rights so that they are assured of receiving the benefits of the protected and improved forest resources. In a similar study the finding further agrees with the work of Barret (2008), where he reported that the most important factor in stimulating environmental participation would be providing opportunities to increase income, utilize and benefit from the forest.

4.3 Factors Influencing Farmers' Participation in ICBA Activities

The result of the regression analysis in Table 4.3 revealed that sex of the respondents had a p- value (0.001) and significant at 1 % level of probability, having a coefficient of 1.5001

indicates that male sex increase the chances of participation. This could be attributed to the male dominance in most intervention projects or farming activities generally within the study area. This analysis agrees with the findings of Beyene (2008), who found that agricultural projects were mostly dominated by men.

Age also had a p-value (0.002) and significant at 1% level of probability, having a coefficient of -0.0757 indicates that an increase in age can lead to decrease in participation. The implication of this is that as age of the farmers increases tendencies to participate in intervention programmes or projects as well as accepting innovation decreases. This analysis agrees with the findings of Adeniji (2002) who reported that farmers at younger age adopt agric innovation more rapidly than the older ones.

Table 4.3.1 Factors influencing farmers' participation in ICBA activities in the study area

Variables	Coefficient	Standard error	T-value
Constant	6.0556	2.8758	0.004***
Sex	1.5001	0.4146	0.001***
Age	-0.0757	0.0248	0.002***
Household size	0.2541	0.0427	0.000***
Education Level	0.5292	0.1637	0.001***
Farming experience	-0.0276	0.0152	0.070*
Amount of credit accessed	0.9810	0.5930	0.080*
Total farm size	0.7142	0.3695	0.056**
Extension contact	0.8247	0.3746	0.058**
Relative advantage	0.1205	0.0265	0.000***
Compatibility	0.0973	0.0209	0.000***
Affordability	0.5565	0.2017	0.005***
Complexity	0.0063	0.0164	0.700NS

*** p<0.01 Significant at 1% level of probability
** p<0.05 Significant at 5% level of probability
* p<0.010 Significant at 10% level of probability
NS = Not Significant
$R^2 = 0.79 = 79$
R-square adjusted = 0.7385
F-value = 16.03

The study further found that household size had a p-value (0.000) and significant at 1% level of probability, having a coefficient of 0.2541 indicates that an increase in household size can lead to increase in participation. The findings revealed that household size was also a factor that influences participation in intervention projects; this could be attributed to some factors such as increase of income and availability of labour. This agrees with the findings of Gbadegesin (2003) who found out that the respondents kept large family size to provide cheap family labour on the farm.

The respondents' educational level in Table (4.3) depicted a p-value (0.001) which is significantly at 1% level of probability, having a coefficient of 0.5292 indicates that an

increase in educational level can lead to increase in participation.. This implies that education plays a significant role in farmers' behaviour towards accepting and rejecting innovations. However, this finding is in contrast with the work of Auta *et al.* (1992) were they found out that there was no significant difference between literate and non- literate farmers in their adoption behavior.

As depicted in table 4.3 farming experience have a p-value (0.070) and significant at 5% level of probability, having a coefficient of -0.0276 indicates that an increase in farming experience can lead to decrease in participation. This implies that those farmers with high years in farming experience tend to participate less intervention projects believing that they have enough experience to undertake their farming activities. This finding is in contrast to the findings of Yahaya *et al*. (2007) where they reported that farming experience was related to adoption level. Amount of credit accessed was found to have a p-value (0.080) and significant at 5% level of probability, having a coefficient of 0.9810 indicates that an increase in the amount of credit accessed can lead to increase in participation. This implies that access to credit has significant influence in motivating farmers to participate in intervention projects and to try new innovations. This validate the work of Agbamu *et al*. (1996) who found out that availability of credit facilities is a critical factor in agricultural transformation and amount of credit available to farmers can also influence the level of adoption of modern technology by farmers.

Total farm size of the respondents was found to had a p-value (0.056) and significant at 5% level of probability, having a coefficient of 0.7142 indicates that an increase in farm size can lead to increase in participation. This implies that the more farms the farmers possessed

land the more the chances of committing some to trial of innovations, as against the contrary if the farmer has limited farm size his concerned will be to utilized the little he has to achieved his self demands.

Extension contact was found to have positive t-value (0.058) at 5% level of probability. This implies that the higher the number of extension contacts to the farmers the higher the level of participation in ICBA activities. Therefore, farmers with low or no extension contact with extension agents may not be able to participate. The results agreed with the findings of Atala *et al.* (1992) who reported that in Kaduna State, the most important variables which influenced participation were extension contact, farm size and hired labour. The result further supported Ahmad (2010) whose findings revealed that extension contact was a variable related to participation in Nasarawa State.

The relative advantage also had positive p-value (0.000) and significant at 1% level of probability, having a coefficient of 0.1205 indicates that an increase in relative advantage can lead to increase in participation. This implies that the more the farmers realized the benefits from the project activities they participated the more the tendencies of continued participation.

Compatibility had positive p-value (0.000) and significant at 1 % level of probability, having a coefficient of 0.0973 indicates that an increase in compatibility can lead to increase in participation. This result indicated that the ICBA activities introduced conform to the farmers' culture, norms and values as well as their needs. Suffice here to say that the ICBA activities were well accepted within the communities being executed. This finding

disagrees with the work of Iqbal (2007), where he postulated that most agricultural projects fail because when projects are designed, farmers or local ethics, culture and socio-economic characteristics are not considered which lead to outside agents not being able to develop and recommend appropriate technologies that are compatible with the target group.

Complexity of the ICBA activities was found to be not significant with a p-value of (0.700), having a coefficient of 0.0063 indicates that an increase in the complexity can lead to decrease in participation. This implies that the activities introduced by the ICBA project within the study area are not complex, hence the reason for their acceptability. Affordability of ICBA activities had a positive p-value (0.005) and significant at 1% level of probability. This indicated that the activities introduced to the farmers are within the reach of the farmers. This supported the findings of Ojo (2009) who found out that a positive contribution of technology affordability to adoption of recommended cassava production practices.

The coefficient of multiple determination, F-value tells about proportion of the variation explained by the model which give a value of 16.03 which is clearly seen from our R-square adjusted value 0.7385. This implies that there is existing relationship between Y variable and other X variables, whereby about 73% of the variations observed in the activities introduced by the ICBA project were explained by the independent variables; only 27% was accounted by variables not captured in the model. Also the result indicated that 8 variables were significant at 1%, 2 variables at 5% and 2 variables at 10% level of probability, while only one variable is not significant.

4.3.1 Test of Hypotheses

Hypothesis (i):

It was hypothesized that Socio–economic characteristics of respondents have no influence on the level of Participation of farmers in ICBA activities. The result in table 4.3.1 shows that the socio-economic factors influencing participation in ICBA activities were sex with p-value (0.001) significant at 1% level of probability, age had (0.002) significant at 1%, household size (0.000) and significant at 1%, while education level of the respondents had p-value (0.001) significant at 1%, then farming experience with (0.070) significant at 10%, amount of credit accessed had (0.080) significant at 10% and total farm size of the respondents had (0.056) significant at 5%. The R^2 adjusted was (0.7385), p-value was (0.0000) significant at 1% level of probability. This implies that about 79% of the variation has been captured by the model and significant at 1 % level, only 21% was accounted by variables not captured in the model. Therefore, farmers' socio-economic characteristics had significant influence on the level of Participation of farmers in ICBA activities. This is contrary to the hypothesis stated therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted

Hypothesis (ii):

It was hypothesized that Participation in ICBA activities has no influence on farmers' yield. The result of analysis in table 4.4.1 indicates that the calculated Z-value (1.822) was greater than the tabulated Z-value (1.64) one tail, significant at 5% probability level. This implies that, participation in ICBA activities had significant influence on yield of the farmers. Therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted.

Hypothesis (iii):

It was also hypothesis that, Participation in ICBA activities has no influence on farmers' income. The result of analysis in table 4.4.2 found out that the calculated Z- value (3.542) was greater than the tabulated Z-value (1.64) one tail, significant at the 5% probability level. This implies that, participation in ICBA activities had significant influence on yield of the farmers. Therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted.

Hypothesis (iv):

It was hypothesized that Participation in ICBA activities has no influence on farmers' level of living. As contained from the result in table 4.4.3 it was found out that the Z calculated (3.46) was greater than the table Z -value (1.64) one tail, significant at the 5% probability level. This implies that, participation in ICBA activities has significant influence on the farmers' level of living. Therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted.

4.4 Effects of ICBA Activities on Participants and Non-participants Yield, Income and Level of Living

4.4.1 Effects of ICBA activities on farmers yield

The result of analysis in Table 4.4.1 depicted that z Critical is 1.64 while, the calculated Z value was found to be 1.822 at one tail and significant at 5% probability level. The result shows that there is significant difference between the yield of the farmers that participated in ICBA project activities and those that did not participated. This implies that participation in ICBA activities had effects on the yield of the respondents in the study area.

This finding agrees with the findings of Okeh, (2010) were he reported that there was a difference between Programme Participant Farmers (PPFs) and Non-Programme Participant Farmers (NPPFs) in production capabilities (crop yields) and marketing capabilities in Plateau State where statistically difference stood at 5% level of probability. Further, the study affirmed that income by programme participant farmers and non-programme participant farmers was significant difference at 5 % level of probability.

Table 4.4.1 Z-test result on effects of ICBA activities on farmers' yield

Variable	Participants	Non-participants
Mean	5399.339185	5092.289524
Known Variance	2160974.734	1417754.615
Observations	60	111
Hypothesized Mean Difference	0	
Z	1.390107897	
P(Z<=z) one-tail	1.822428058	
z Critical one-tail	1.644853627	

4.4.2 Effects of ICBA activities on farmers income

As contained in table 4.4.2 the analysis revealed that the calculated Z-value (3.542) was greater than the tabulated Z – value of (1.64) one tail at 5% probability level. This implies that participation in ICBA activities had effect on farmers' income in the study area.

This finding disagrees with the findings of Ojo (2009), about 66.67% of the respondents claimed to earn between ₦19, 000 – ₦69, 999 and 43.33% of the respondents earned above ₦ 69,000. This implies that very few respondents probably obtained good financial returns from the adoption of the innovation which contradicts the findings by Inusa (2010).

Table 4.4.2 Z-test result on effects of ICBA activities on farmers' income

Variable	Participants	Non-participants
Mean	688895.22	476179.0189
Known Variance	4.098021277	6.353081413
Observations	60	111
Hypothesized Mean Difference	0	
Z	0.374021282	
P(Z<=z) one-tail	3.541942411	
z Critical one-tail	1.644853627	

4.4.3 Effects of ICBA activities on farmers level of living

The result depicted in table 4.4.3 indicates that the calculated Z-value (2.201) was greater than the table Z-value (1.64) one tail, significant at 5% level of probability. This implies that participation in ICBA activities had effect on level of living of farmers that participated in ICBA activities.

This finding agrees with the findings of Abubakar, (2005) where he reported that the mean score of level of living of the participants was N398, 501 while that of the non-participants was 312, 264, with standard deviation of 122, 110 and 234, 416 respectively. The findings also confirmed the findings by Jiriko, (2006) in her research impact of assessment of project agape micro-credit on trade, income and level of living of women traders in Nasarawa State in which she asserted that that the difference in mean daily meal and food rate of non-beneficiaries and beneficiaries was significant with a t-value of 2.373 and 5.272 respectively.

Table 4.4.3 Z-test result on effects of ICBA activities on farmers' level of living

Variable	Participants	Non-participants
Mean	66296.678	38754.58032
Known Variance	26735350322	17744471972
Observations	60	111
Hypothesized Mean Difference	0	
Z	2.840382081	
P(Z<=z) one-tail	2.201252976	
z Critical one-tail	1.644853627	

4.5 Constraints Faced by Farmers Participating in ICBA Activities

As revealed by the result in Table 4.5 the major constraint identified is poor market especially during glut periods in tomato and pepper marketing this was represented by about 62% of the responses. The second in ranking of the constraints is high cost of Irish potato planting materials which has about 54% of the responses. Non availability of improved pepper seeds and inadequate finance were ranked third and fourth with about 52% and 45% of the responses respectively.

The result of the study supported the finding of Botlhoko, G. J. and Oladele, O. I. (2013) were they reported that the major constraints to participation in intervention projects are unavailability of land, lack of resources, and lack of funds which were 81.1%, 92.2%, and 93.3% respectively. Closely related to this is the inaccessibility to market and the monopoly of market and value-chain processes that have been operational since apartheid regime. Similarly, Mwangwela and Düvel (2006) stated that inadequate resources by services providers are one of the barriers to participation in agricultural projects. Mpandeli et al. (2009) also found that lack of resources is one of the major constraints facing farming community. Furthermore, Yusuf (2010) in addition reported that 28.0% of the sampled

respondents affirmed that loan acquisition was a problem affecting the adoption of improved groundnut oil processing technologies by farmers in Kaduna State.

Table 4.5.1 Constraints faced by farmers participating in ICBA activities

Constraints	Frequency	Percentage	Ranking
Poor market especially during glut periods in tomato and pepper marketing	94	62.67	1st
High cost of Irish potato planting materials	81	54.00	2nd
Non availability of improved pepper seeds	79	52.67	3rd
Inadequate finance	67	44.67	4th

***** Multiple responses were allowed hence, the frequency exceeded the sample size.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

This study was undertaken to assess the effects of International Centre for Bio-saline Agriculture (ICBA) project activities to the level of living of Farmers in Kaduna State. A multi stage sampling procedure was employed in this study, in stage one a purposive selection was used to select three local government areas in the State where ICBA activities were conducted, In the second stage, participating members from seven villages where ICBA activities was conducted was purposively selected. The selected villages were Hayin gada, Hayin malam, Birnin bakko, Galma, Bizara, and Taban sani. The sample size for the study was 172 participants and non-participants which were randomly selected, and the data were collected from farmers in July, 2014 from 2014 cropping season.

Descriptive statistics, multiple regression and Z-test were used to analyze the data. The first objective of the study was to describe the socio-economic characteristics: table 4.1 shows that, the mean age of the participants is 39 years, while the non-participants mean age is 33 years. All the farmers interviewed were male and married in the study area. The mean household size of the participants was 9 people, while that of the non-participants was 8 people. The result further found out that 10 % of the participants were able to obtain education up to the tertiary level, while only about 3% of the non-participants were able to do so, so, majority about 73% of the participants had contact with the extension agents, while only about 15% of the non-participants had contact with the extension agents. About 53% of the participants had access to credit, while only about 21% of the non-participants had access to credit.

The results in Table 4.2 depicted about 88%, 85%, 83%, 82%, 80% and 80% of the participating farmers were engaged in field days, agricultural marketing, post harvest and storage, exchange visits, crop protection and livestock production demonstrations and activities respectively. Furthermore, the results of multiple regression analysis revealed that influence of socio-economic variables: household size (0.000), educational level (0.001), farming experience (0.070) farm size (0.056) compatibility (0.000) and affordability (0.005) had significant contribution to farmers' participation in ICBA activities. The result of the analysis on farmers yields depicted that Z-Critical was 1.64 while, the calculated Z-value was found to be 1.82 at one tail and significant at 5% probability level, the analysis also revealed that the calculated Z-value (3.54) on farmers income was greater than the tabulated Z – value of (1.64) one tail at 5% probability level. On farmers level of living the result depicted that the calculated Z-value (2.20) was greater than the tabulated Z-value (1.64) one tail, significant at 5% level of probability.

Constraints identified by the result of the study include; Poor market especially during glut periods in tomato and pepper marketing, high cost of Irish potato planting materials, non availability of improved pepper seeds and inadequate finance.

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5.2 Conclusion

In relation to the findings of this study, it can be concluded that participation in ICBA project activities had a positive effect on the life of farmers that participated within the study area. Participation in ICBA project activities had increased the yield, income and level of living of the participating farmers within the study area more than the non-

participants. The factors responsible for influencing participation in ICBA activities were age, educational level, farming experience, amount of credit accessed, compatibility relative advantage and affordability.

5.3 Recommendations

Based on the findings of this study, the following recommendations were proffered to encourage farmers' participation in intervention projects especially within the study area:

i. It was found that although about 53% of the participating farmers had access to credit, but there are still some draw backs such as its timeliness and the issue of tendering collateral before accessing the credit. It is therefore recommended that disbursement of loans should be timely and social capital should be considered where an applicant do not have collateral asset. This will pave way to other participating farmers to also get access to the credit.

ii. It was also recommended that the project officials should add saving motivation concept into the project activities; to serve as one of the sustainability mechanism that can make the project activities to continue even after the life span of the project.

iii. It was also found out that the yield and income obtained by the participants are higher than that of the non-participants; it was recommended that the project should expand its activities to engage more farmers and more communities to improve the level of living of other farmers.

iv. It was found that the major constraint faced by the farmers was poor market especially during glut periods in tomato and pepper marketing. It is therefore recommended that the farmers should organize themselves and set up a cottage

industry for processing tomato and pepper to address this issue. Subsequently, the attention of the relevant authority such as the Local Government or State Government should be sought for a major processing plant for the community.

v. The study further found out that high cost of Irish potato planting materials was another constraint limiting farmers attaining full potential of Irish potato production. It is recommended that alternative means of planting should be sought by the project officials from relevant research institutes especially root crop research institutes as well as private organizations. Then a link between the farmers and such organizations should be established for sustainable patronage.

5.4 Contributions of the study to Knowledge

i. The result of the study discovered that seven variables captured in the model were significant at 1% level of probability, one variable was significant at 5% level of probability, two variables were significant at 10% level of probability and one variable was not significant to farmers' participation.

ii. The study discovered that the mean income of the participants was ₦ 688, 895.22, while the non-participants income was ₦ 476, 179.02.

iii. It was found that for the level of living, the calculated Z-value (2.201) was greater than the tabulated Z-value (1.64) one tail, significant at 5% level of probability.

5.4 Suggestions for further study

From the findings and conclusion of this study, the following suggestions for further studies are made:

i. There is the need to conduct Strength Weakness Opportunities and Threats (SWOT) analysis of the project to identify areas where the project has more opportunities and strengthen its activities, and also to device ways and means to overcome its weakness as well as threats.

ii. There is the need to conduct an impact study on International Center for Bio-saline Agriculture (ICBA) Project activities to further bring the benefits of the project into knowledge.

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APPENDIX I: QUESTIONNAIRE
Department of Agricultural Economics and Rural Sociology,
Faculty of Agriculture,
Ahmadu Bello University, Zaria

QUESTIONNAIRE FOR ICBA PROJECT PARTICIPANTS AND NON-PARTICIPANTS

Dear Sir/Madam,

I am a postgraduate student of Ahmadu Bello University, Zaria, currently working on the following topic: **"Effects Assessment of International Center for Bio-saline Agriculture Project Activities to the Level of Living of Farmers in Kaduna State, Nigeria."**

Please answer the questions to the best of your knowledge, all information supplied will be treated with confidentiality.

Thank you.

Ibrahim Jumare SAMBO

SECTION A1: BACKGROUND INFORMATION

1.1 Name of respondent----------

1.2 Name of Village----------

1.3 Name of L.G.A.----------

1.4 Name of State----------

SECTION A2: SOCIO-ECONOMIC CHARACTERISTICS OF ICBA PROJECT PARTICIPANTS AND NON- PARTICIPANTS IN THE STUDY AREA.

1.5 Age----------years

1.6 Sex: male ( ) Female ( )

1.7 Marital Status: Married ( ) Single ( )

Indicate your household size:

1.8 How many wives do you have? ----------

1.9 How many children do you have? ----------

1.10 Beside your wife(ves) and children, are there some people living with you?

Yes ( ), No ( )

1.11 If yes, how many of them? ----------

1.12 Highest Educational attainment of Household Head;

a. Adult education ----------years
b. Koranic education----------years
c. Primary education ---------- --------years
d. Secondary education----------years
e. Tertiary education ----------years

1.13 The main occupation of the household: (tick as appropriate)

1. Agriculture (crop and livestock) ( ) 2. Agriculture (crop only) ( )
3. Agriculture (livestock only) ( ) 4. Petty trading ( )
5. Paid employment (permanent) ( ) 6. Paid employment (temporary) ( )
7. Artisans_____ ( )

1.14 The secondary occupation of the household :

1. Agriculture (crop and livestock) ( ) 2. Agriculture (crop only) ( )
3. Agriculture (livestock only) ( ) 4. Petty trading ( )
5. Paid employment (permanent) ( ) 6. Paid employment (temporary) ( )
7. Artisans_____ ( ) 8. No secondary occupation ( )

1.15 How long have you been in the ICBA Project? ----------Years

1.16 Do you belong to any farmers' organization? Yes ( ) No ( )

1.17 If yes, how many farmers' organizations do you now belong to? ---------

1.18 If yes, for how long have you been a member? ----------

1.19 Did you receive any visit by extension workers in 2014? Yes ( ) No ( )

1.20 If yes, how many times were you visited by the extension workers during the 2014 farming season? ----------Times.

1.21 Are you satisfied with the visit(s)? Yes ( ) No ( )

1.22 If yes, give reasons.

If no give reasons.

1.23 Do you have access to credit for ICBA Project activities? Yes ( ) No ( )

1.24 If yes, state sources and amount of credit received in 2014

S/No	Sources	Amount(₦)
1		
2		
3		
4		
5		

1.25 If no, how do you finance ICBA project activities? Tick as appropriate

i. Personal savings ( )
ii. Friends/Family ( )
iii. Farmer cooperative ( )
iv. Agricultural bank ( )
v. Commercial bank ( )
vi. Others(specify) ( )

1.26 Did you re-pay the credit? Yes ( ) No ( )

1.27 If no, please give reasons for not re-paying the credit.

SECTION A3: THE ICBA PROJECT ACTIVITY ATTRIBUTES

Questions 1.29 -1.32 please tick from the following list using:

SA = strongly agree = 5, A = agree= 4, UD = undecided = 3, D = disagree = 2, SD = strongly disagree = 1

1.28 The following activities conducted by ICBA are expensive to use (affordability)

S/No	ICBA project activities	SA	A	UD	D	SD
i.	Capacity building					
ii.	MTPs					
iii.	Field days					
iv.	Exchange visits					
v.	Inputs sourcing					

1.29 The following activities conducted by ICBA has meet the needs and existing norms and values of the farmers (Compatibility)

S/No	ICBA project activities	SA	A	UD	D	SD
i.	Capacity building					
ii.	MTPs					
iii.	Field days					
iv.	Exchange visits					
v.	Inputs sourcing					

1.30 The following activities conducted by ICBA are difficult to use (Complexity)

S/No	ICBA project activities	SA	A	UD	D	SD
i.	Capacity building					
ii.	MTPs					
iii.	Field days					
iv.	Exchange visits					
v.	Inputs sourcing					

1.31 The following activities conducted by ICBA are not beneficial to the farmers (Relative advantage)

S/No	ICBA project activities	SA	A	UD	D	SD
i.	Capacity building					
ii.	MTPs					
iii.	Field days					
iv.	Exchange visits					
v.	Inputs sourcing					

SECTION B: LEVELS OF ACTIVITIES INTRODUCED BY ICBA TO THE FARMERS.

2.1 During the last cropping year did you participate in any farmers training program, apart from NAERLS ICBA Project training? Tick as appropriate

1. Yes, 2. No 3. There was no training program in our area

2.2 If YES, what was/were the topic(s) of the farmers training you participated in (mark X in blank space)

i. About crop production ( ) ii. About livestock production ( )

iii. About irrigation management ( ) iv. About soil and water conservation ( )

v. About agricultural marketing ( ) vi. About crop protection ( )

vii. About post harvest and storage ( ) viii. Other (specify): ( )

2.3 If Yes to 2.1, are you involved in the activities of the ICBA/SSA Project?

1. Yes ( ) 2. No ( )

2.4 Did you participate in the demonstration on farmers' field activities of the ICBA/SSA Project? Tick as appropriate

1. Yes ( ) 3. There was no field demonstration activities in our area ( )
2. 2. No ( )

2.5 If YES, what was/were the aspect(s) of the activities demonstrated on farmers' field did you participate in (mark X)

1. About crop production ( ) 2. About post harvest and storage ( )

3. About irrigation management ( ) 4. About soil and water conservation ( )

5. About agricultural marketing ( ) 6. About crop protection ( )

7. Other (specify): ( )

SECTION C: FACTORS INFLUENCING FARMERS' PARTICIPATION IN ICBA ACTIVITIES.

3.1 How useful is the experience you acquired by participating in the ICBA/SSA Project's activities?

1. Not useful ( ) 2. Low use ( ) 3. I have not evaluated it yet ( )

4. Somehow useful ( ) 5. Very useful ( )

3.2 During the last 2-3 years did you receive any form of agricultural extension services from the ICBA/SSA Project?

1. Yes ( ) 2. No ( )

3. There are no extension services provided by the ICBA/SSA Project in our area ( )

3.3 If YES, do you get useful information related to :

a. Water management ( )

b. Agricultural production ( )

c. Marketing of agric. Product ( )

d. Extension services ( )

3.4 Circle the appropriate rank for the following Irrigation Technology using the numbers below? (1 = Not useful 2 = Low use 3 = I have not evaluated it yet 4 = Somehow useful 5 = Very useful)

a. Open Floor Method	1	2	3	4	5
b. Check Furrow	1	2	3	4	5
c. Basin Method	1	2	3	4	5

3.5 If the ICBA/SSA Project is to be expanded in your area, what new component(s) or activities do you suggest should be added?

_____

_____

_____

_____

3.6 Select from the following where ICBA Project Improve your Production

a. Training on New Production technique ( )
b. New Crop Variety Introduced to us ( )
c. Introduced New Crop Type ( )
d. Introduced New Skill in Water Harvesting Method ( )
e. Linked with ABU Micro-finance Bank ( )
f. Received training on Product Marketing ( )
g. Provide 2us with Skills on Water Management ( )
h. None of the above ( )

3.7 Circle the appropriate rank from the following variety of Tomato you were using. (1 = Not useful 2 = Low use 3 = I have not evaluated it yet 4 = Somehow useful 5 = Very useful)

a.	UC82B –UTC Tomato Variety	1	2	3	4	5
b.	UC82 Tomato Variety	1	2	3	4	5
c.	Trop Mech Tomato Variety	1	2	3	4	5
d.	Old Tomato Variety	1	2	3	4	5

3.8 Why do you Prepare the variety selected: Tick as appropriate

a. It Attract good Market ( )
b. It is not Highly Perishable ( )
c. Easy on Transportation ( )
d. Produce higher than the local variety ( )

SECTION D: EFFECTS OF ICBA ACTIVITIES ON YIELD, INCOME AND LEVEL OF LIVING OF FARMERS IN THE STUDY AREA

4.1 What type of residential house does the household own? Tick as appropriate

i. Iron-roofed and mud floor ( )
ii. Iron-roofed and cemented floor ( )
iii. Roof made of grass/other materials and cemented floor ( )
iv. Roof made of grass/other materials and cemented floor ( )
v. Roof made of grass/other materials and mud floor ( )

4.2 What are the three main sources of drinking water for the household?

1: _____, 2: _____, 3 :_____(write choice Nrs.)

i. Private Borehole v. Open well

ii. Private Borehole vi. Supply tanker

iii. Public Tap vii. Spring/river/pond

iv. Public Borehole viii. Any other: _____ (specify)

4.3 What are the three main types of fuel used for cooking by the household :

1: _____, 2: _____, 3 :_____(write choice Nrs.)

1. Firewood 6. Electricity
2. Coal 7. Bio-gas
3. Kerosene 8. Charcoal
4. LPG (Gas) 9. Any other: _____(specify)
5. Cow dung

4.4 Does the household have its own toilet? 1. Yes ( ) 2. No ( )

4.5 If yes, what type of toilet is used? _____

i. Service latrine ( )

ii. Septic tank ( )

iii. Flush system ( )

iv. Other _____(specify)

4.6 Does your household own any agricultural land? 1. Yes 2. No _____

4.7 If yes, how much land does your household own (in hectare)? [1] _____

i. Land for annual crops (excluding forage crops) _____

ii. Land for permanent crops (trees, fruit trees, shrubs) (in hectare) _____

iii. Land for cultivated forage crops (annual and perennial) (in hectare) _____

iv. Land for natural forage crops and pasture (in hectare) _____

Note: select the main type of local unit that is used, 1 local unit = ……hectare

4.8 In any one of the last 5 years, has your household Rented-in or out agricultural land?

1. Yes ( ) 2. No ( )

4.9 If yes, what maximum size did you rented- in (ha)? _____; rented -out? _____

4.10 In any one of the last 5 years, has your household engaged in Sharecropping of

_____

agricultural land? _____ 1. Yes ( ) 2. No ( )

4.11 If yes, what maximum size did you Sharecrop- in (ha)? ____; Sharecrop-out? ____

4.12 Educational status of children in your household (whose ages are up to 25 years):

Number of children who have NOT reached school age: Boys _____Girls _____

Number of children currently going to schools: Boys _____ Girls _____

Number of children who have completed/dropped-out of schools: Boys ____Girls ___

Household asset holding

4.13 Please indicate the amount of livestock owned and estimated current market values by type of animal

S. Nr	Type of livestock	Currently owned (No)	Total estimated current market value (Local Currency)	Currently kept and used (not own) (No)
1	Oxen and young bulls			
2	Cows and heifers			
3	Sheep			
4	Goat			
5	Horse			
7	Mule			
8	Donkey			
9	Chicken			
10	Bee hives			

4.14 Please indicate other household and farm assets owned: do you own the following assets?

S. Nr	Type of asset	Currently owned (No)	Total estimated current market value (Local Currency)	Purchase or construction cost
1	Horse /donkey cart			
2	Bicycle			
3	Dug water well			

4	Chemical sprayer			
5	Watch			
7	Radio			
8	Water tanker			
9	Pick-up/bus			
11	Mobile phone			
12	Tape recorder			
13	Grain storage built (modern)			
14	Pit (site) for compost making			
15	Motor cycle			
16	Ox-plough			
17	Hand plough			
18	Hand hoe			
19	Tractor			

Household income, expenditure and food supply

4.15 During the year that ended December 2014, how much **crop products** did your household produce from farming activities, consume and sell to market?

S/N	Crops	Quantity produced	Quantity consumed	Quantity Sold
1	Maize			
2	Sorghum			
3	Rice			
4	Other			
5	Cowpea			
6	G/nut			
7	Soybeans			
8	Other			
9	Tomato			

10	Pepper			
11	Cabbage			
12	Okra			
13	Amaranthus			
14	Carrots			
15	Other			
16	Yam			
17	Cassava			
18	Sweet potato			
19	Irish potato			
20	Other			
21	Sugar cane			
22	Chilies			
23	Cotton			

4.16 During the year that ended December 2014, how much **livestock products** did your household produce from own livestock activities, consume and sell to market?

i. Milk: produced in (Lit) _____; Consumed at home _____; sold to market _____
ii. Meat: produced in (Kg)_____; Consumed at home _____; sold to market _____
iii. Butter: produced in (Kg)_____; Consumed at home _____; sold to market _____
iv. Eggs: produced in (No) _____;Consumed at home _____; sold to market _____
v. Cheese: produced in (Kg)_____; Consumed at home _____; sold to market ____
vi. Hides &Skin: produced in (No)_____ used at home _____ sold _____
vii. Others (e.g. wool) produced (qt)_____ ; used at home _____; sold _____
viii. Honey: produced in (Kg)_____; Consumed at home; _____; sold to market _____
ix. Fish products in (Kg)_____; Consumed at home _____; sold to market _____

4.17 During the year that ended December 2014, how much **cash money** did your household spend to purchase/buy food from the market? (Flour, grains, pulses, milk, meat, etc)

i. Amount of money spent to purchases **food grains and flour**: ₦_____
ii. Amount of money spent to purchases **livestock products**: ₦ _____
iii. Amount of money spent to purchases **fish and related food**: ₦_____
iv. Estimated **total** amount of money spent to buy food from market/shops: ₦_____

4.18 During the year that ended December 2014, how much **cash money** did your household spend for farming activities?

i. To hire farm labour (value in kind and cash paid): ₦ _____
ii. For purchase of seeds (Qty of seeds Used _____ Amount per Tiya: ₦_____
iii. Quantity of fertilizers Used NPK _____Urea_____
iv. Amount per bag NPK: ₦ _____Urea: ₦ _____
v. Litres of Herbicide used : _____ Amount per litre: ₦ _____
vi. Payment for traction power rented (Tractor, oxen, etc): ₦ _____
vii. For purchase of farm tools and implements (plough, spade, fork, etc,): ₦_____
viii. For purchase of animal feed (hay, concentrates, salt, etc): ₦ _____
ix. For livestock veterinary (drugs, treatment, etc,): ₦ _____
x. Expenses related to use of irrigation (water assoc., canal maintenance, etc): ₦ ___
xi. Land related (land tax, land rent, land contract fee): ₦ _____
xii. Market related cost (sales tax, transport): ₦ _____
xiii. Purchase of land: ₦ _____
xiv. Purchase of livestock (cattle, sheep, goats, chicken): ₦ _____

4.19 During the year that ended December 2014, how much **cash money** did your household spend for non-farming and non-food items?

i. For children's school: ₦ _____
ii. For social and festival events: ₦ _____
iii. For household medication (drugs, treatment, etc) ₦ _____

iv. For clothing and foot wear: ₦ _____

v. For house construction/maintenance, etc: ₦ _____

vi. For household furniture, utensils, etc : ₦ _____

4.20 What are the main sources of **cash income** for the household by order of importance (Rank 1st, 2nd, and 3rd)? Indicate the amount of income earned in year 2014 (in local currency).

a. Crop production Income _____

b. Livestock and fisheries production Income _____

c. On-farm non-agricultural activities (like handicrafts) Income _____

d. Off-farm work (petty trade, trade, selling food, etc) Income _____

e. Remittances from elsewhere Income_____

f. Rent income of assets (land, oxen, etc) Income _____

g. Formal salaried employment Income_____

h. Seasonal farm labour employment Income_____

i. **Total cash income** earned by members of the household during 2011: _____

4.21 During a year of **normal** agricultural production, for how many months is your own farm production enough to cover your household's food consumption needs? _____

4.22 During the last three years, on average, what total **annual amount of food grains** did you purchased from the market for your household's food consumption needs? _____ Bags

4.23 Select from the following areas where you give priority in your family expenses (Multiple selections applicable)

4.20.1.1.1	Payment for children school fees	( )
4.20.1.1.2	Purchased of Production assets	( )
4.20.1.1.3	Purchased of Vehicle	( )
4.20.1.1.4	Purchased of Food Item	( )
4.20.1.1.5	Savings for future expenses	( )
4.20.1.1.6	Payment for Debt	( )
4.20.1.1.7	Invest in Other Business	( )
4.20.1.1.8	Add Wife	( )

SECTION E: CONSTRAINTS FACED BY FARMERS PARTICIPATING IN ICBA PROJECT ACTIVITIES

5.1 State any problem(s)you have observed with NAERLS ICBA Project:

_____

_____

_____

_____

5.2 What are your suggestion(s) to solve the problem(s)?

_____

_____

_____

_____

Thank you very much for the time and cooperation given.