CHAPTER ONE

1.0 Introduction

1.1 Background of the Study

There is a renewed emphasis on agriculture because of its role in economic development. Agricultural development remains fundamental for feeding the growing world population. The 2008 World Development Report and the 2009 L'Aquila Food Security Initiative have all put a spotlight on agricultural development as essential in reducing poverty, tackling food insecurity and ending hunger. The global food price crises in 2007-2008 and 2010-2011 which worsened food insecurity further placed the importance of investment in agriculture in the limelight. In Africa where agricultural productivity is low but contributes largely to gross domestic product (AGRA, 2013). There have been several initiatives in recent years aimed at enhancing agricultural development in the continent. For instance, the Comprehensive Africa Agriculture Development Programme (CCADP) Initiative of the African Union (AU) and the establishment of the Alliance for a Green Revolution in Africa (AGRA) in 2004 have been aimed at boosting agricultural investment and productivity in Africa. The AU declaration of 2014 as the year of agriculture and food security further buttresses the importance of agriculture in the continent. This renewed effort on agriculture has contributed to increased food production in the last decade. Despite this achievement, nearly 850 million continue to be hungry and food insecure and about one-quarter of them live in Sub-Saharan Africa (FAO et al., 2013). Most of these undernourished people are smallholder farmers (SHFs), who live below the poverty line in the rural areas and derive their livelihoods from agriculture (McIntyre et al., 2009).

In Kaduna state and Zaria Local Government Area (LGA), farming and its related activities are the fabric of the rural society because agriculture has an important role in the development the

economy in enhancing food security, poverty reduction, infrastructures development and the quality of the environment. SHFs are identified as the vital development tool for achieving one of the objectives of Sustainable Development Goals, one of which is to halve the people suffering from extreme poverty and hunger (World Bank, 2016). Majority of SHFs in Zaria LGA relies on traditional methods of production which has lowered their productivity. For instance estimates of over 70% of maize production of the developing countries are SHFs who uses traditional methods of production (Muzari et al., 2012). These SHFs in the study generally obtain very low crop yields because of the local varieties used by farmers have low potential yield, most of the maize are grown under rain-fed conditions and irrigation are used only in limited areas, little or no fertilizers are used and pest control is not adequate (Muzari et al., 2012; Shao, 1996). As over the years, deliberate efforts have been made to improve agricultural production by the governments and some foreign bodies but these efforts have not yielded the expected results. The failure can be attributed to the adapted transformation approach to agriculture which is characterized by the introduction of a wide variety of large scale farming and processing technologies. The emphasis is now from the big scale transformation approach to the small scale improvement strategy approach which is attuned to Nigerian age-long farm practice.

The SHFs in the rural areas of Zaria LGA of Kaduna state had very limited access to modern technologies, lack access to agriculture innovation information, operate under high costs of production that affects both the commercial and SHFs and have limited access to credit facilities which reduces their productivity to a great extent. In spite of the fact that Kaduna state has a lot of cultivable land with great percentage converted to other uses than agriculture. In addition to these challenges, Obiechina (2012) points out that the main reason for poor performances of farmers is due to lack of commitment by all tiers of governments to implement the right policies.

Successful agricultural transformation depends on a strong enabling environment, however this calls for a renewed focus on agricultural production that will enhance sustainable production of food which is critical for sustainable food security, poverty reduction and overall rural economic growth. Innovation and technological advancement in agriculture are essential in reducing poverty, fostering development and stimulating economic growth in developing countries (World Bank, 2012).

In Kaduna state, this has been the case, as the government has created the enabling environment for the work of agricultural research and development agencies that recognize the potential for improving rural livelihoods by enabling rural development through agricultural development via the introduction of renewed agricultural programmes and policies amongst SHFs and hence reducing rural poverty. Thus, in essence this emphasizes the role of the Kaduna Agricultural Development Project (KADP) to collaborate with the Kaduna State Ministry of Agriculture. Since the inception of KADP in 1985, it has successfully executed a number of programmes but for the purpose of this study, we will consider one of the ongoing programmes; the Anchor Borrower Programme (ABP) currently being executed by the state government in collaboration with the Central Bank of Nigeria (CBN), Anchor companies (Off-Takers) and other Stakeholders involved.

Anchor Borrower Programme (ABP) was launched by President Muhammadu Buhari (GCFR) on November 17, 2015 in Birni Kebbi, Kebbi state. ABP is a renewed credit scheme which is intended to create a linkage between anchor companies involved in the processing and SHFs of the required key agricultural commodities. The apex bank explained that the scheme involves a credit-finance model whereby the anchor firms, CBN, Nigeria Incentive Based Risk Sharing System for Agricultural Lending (NIRSAL) and state governments Agricultural Development Programme (ADPs) organised the out-growers and ensure that they comply with contractual terms. The

financing institutions will serve as veritable channels for delivering credit to the out-growers. Under the credit scheme, the operating model defines key roles, requirements and obligations of stakeholders in the Programme. The key stakeholders include the CBN, NIRSAL, Federal Ministry of Finance and Agriculture; State Governments ADPs; Anchor companies (Off-Takers); Financing banks; Nigerian Agricultural Insurance Corporation (NAIC); Development partners; Farmers/Out-growers and Project Management Team.

The CBN are to provide finance at an all-inclusive interest rate of 9.0 per cent and coordinate the entire programme. State ADPs are to provide technical assistance to farmers, extension workers and banks are to organize farmers into viable cooperatives. The NAIC will provide insurance cover to the projects. The Anchor companies will identify and select potential out growers; provide farm input supplies; provide extension services experts to support and ensure achievements of targeted yield, monitor harvest, facilitate full evacuation of farm produce at an agreed prevailing market price. The apex bank disburses the loan directly to co-operatives accounts and subsequently to the individual farmer's account in a three stage process (pre-planting, planting and post planting).

The ABP was conceived by the CBN to resolve and achieve a strong and viable agricultural base economy with more integrated value chains, enhanced food security, fewer imports, eradicating rural poverty and increasing productivity in the sector.

1.2 Statement of the Research Problem

Agricultural activities among small holder's farmers in Zaria local government area are in small scale, peasant or subsistence practices that involve the use of poor agricultural technique and traditional tools. As a result of that, farmers are largely constrained by poor agricultural resources and cannot respond quickly to price incentives and price volatility. This poses a big challenge to them and makes agricultural production grossly unprofitable particularly as these farmers are

already overburdened by increasing cost of inputs such as fertilizers, high yield seeds, herbicides etc. As such the SHFs require whatever technical and institutional assistance that can be made available to them in order to strengthen their capacity in executing their daily farming activities.

Credit constraint has widely been acknowledged as an impediment to agricultural development in most third world countries. Over the years, government has been able to come up with policies, schemes and palliative measures to assist farmers in enhancing their productivity. Some of these schemes include the Agricultural Credit Guarantee Scheme established in 1977, the Agricultural Credit Support Scheme and Commercial Agriculture Credit Scheme etc. They all seem not to have addressed the prevailing conditions of agricultural production in the study area as agricultural loan delinquency is still high, crop yield is low, low adoption of sustainable land management practice, high import bill amidst dwindling foreign exchange, low value addition and volatility of in agricultural product price that serve as disincentive to agricultural farm business etc.

Peasant farming being the general practice is associated with low yield as farmers hardly realize excess to sell to improve the scale and technique of production as result of market uncertainty and price instability which also affects farmer's income because after harvest every SHFs will pull to sell out which will result to glutting and they will be force to sell at lower price in other to meet up the other basic family needs as a result of being trapped in vicious cycle of poverty. This perpetual trap is manifested by poverty indicators among the peasant farmers in the study area and have exhibited greater prevalence with regards to illiteracy, lack of access to safe drinking water, lack of access to healthcare delivery, increasing income disparity, severe child malnutrition, high mortality rate, declining purchasing power indicate preponderantly how most people are living. Thus, agricultural innovations solutions are needed at all levels to combat these persisting issues.

In lights to these pressing issues, recently the government has developed a policy to mobilize potential credits for the SHFs under ABP which has a record of success in Kebbi, Anambra and Niger state in the value chain of rice production in which farmers are witnessing a bumper harvest (economic boom) that led other states to emulate (CBN, 2016). The ABP recognizes the weaknesses and is set out to breach these gaps experienced in the previous programmes such as farmers field training, providing credits (in cash and kind), monitoring and evaluation of the credits in other to make sure that they being channeled in line with the ABP objective, market and investment opportunities of proceeds etc.

This study has taken a look into the evaluation of the ABP has on maize SHFs in Zaria LGA and how it is being integrated in the context of agricultural development in the study area.

From the above stated problem, the following research questions then arise:

i. What are the socio-economic characteristics of the respondents in the study area?
ii. What are the various innovations introduced by the anchor borrower programme on the beneficiaries of the programme in the study area?
iii. What is the extent of output, income and profitability of smallholder farmers under the programme in the study area?
iv. To what extent has the anchor borrower programme impacted on the welfare of the participating smallholder farmers?

1.3 Research Objectives

In line with the stated research problem and questions, the main objective of this study is to evaluate the impact of anchor borrower programme on maize smallholder farmers in Zaria LGA of Kaduna State while the specific objectives are as follows:

i. To examine the socio-economic characteristics of the respondents in the study area.
ii. To describe the innovations introduced by the anchor borrower programme and the extent of implementation on the beneficiaries in the study area.
iii. To determine the extent of production efficiency and profitability of maize smallholder farmers under the anchor borrower programme in the study area.
iv. To access the impacts of the anchor borrower programme on the wellbeing of the participating smallholder farmers in the study area.

1.4 Research Hypothesis

Consequent upon the foregoing, the study will test the following null hypothesis;

H_{O1}: anchor borrower has no significant impact on production efficiency of maize smallholder farmers in the study area.

H_{O2}: anchor borrower programme has no impact on the profitability of maize smallholder farmers in the study area.

H_{O3}: anchor borrower programme has no impact on the wellbeing of participating maize smallholder farmers in the study area.

1.5 Justification of the Study

Historically, the roots of the crisis in the Nigerian economy today lie in the neglect of agriculture and the increased dependence on a mono cultural economy based on oil which led to the ill state of the agricultural sector today in the economy which requires a major point of concern among various governmental institutions to draw a plan that will revamp and transform. The desire for economic diversification at this point in time is very crucial for development of the economy hence the urgent wakeup call from various governments, individuals and stakeholders of efforts put in place for the economic survival of the country. This circumstance help to explain why agricultural

development should be embrace as a powerful tool for reducing rural poverty, creating jobs opportunity, reducing food importation and eliciting economic development which is by extension remains one of the key components of economy. As such, it is of great significance to examine the recent involvement of the Kaduna state government in the renewed effort of the CBN (Anchor Borrower Programme).

This study is one of the recent studies on accessing the impacts of ABP in the study area. The ABP is an innovative programme that was recently launched in states like Kebbi, Cross-river and Niger which led other state to emulate following its success in the each of the state mentioned above by the CBN. This study will provide an in depth analysis of the impact of ABP has on maize SHFs in the study area.

1.6 Scope and Limitations of the Study

This study focuses on the evaluation of the ABP on maize SHFs output, productivity and wellbeing in some selected rural areas of Zaria LGA in Kaduna state which is a joint effort of the Central Bank of Nigeria and Anchor Company (off-takers). The study is a micro based study that is limited to the value chain of only maize SHFs in the 2016 wet farming season in the Zaria LGA.

There is no doubt that this research will not be carried out without being confronted with some problems that affects the outcome of the research. One of the limitations was that the study was a micro based study that relies on the use of primary data concentrated on assessment of the ABP on maize smallholder farmer in Zaria LGA of Kaduna state. The study lacks a wider coverage that will make a meaningful genaralisation of the results. Also, the study depends on information made available by the respondent's and hence time, finance and logistics remain major constraints in this effort.

1.7 The Study Outline

The study is organised into five chapters. Chapter one is the introductory chapter which provide general information about the study. Chapter two is the literature review which cover the conceptual definition, overviews, reviews, empirical studies and gaps identifies. Chapter three covers the research methodologies. Chapter four covers the presentation, analysis and interpretation of the result of the study. Finally, chapter five summarizes, gives conclusion and possible recommendations of the study.

CHAPTER TWO

2.0 LITERATURE REVIEW

The study will review some relevant literature that relate to the subject matter of this research work.

2.1 Conceptual Definition

2.1.1 Anchor Borrower Programme

ABP is one of the renewed efforts made by the CBN to revolutionize and transform the agricultural sector which was conceived out to resolve and achieve a strong and viable agricultural base economy with more integrated value chains, enhanced food security, reduce imports, eradicating poverty, diversification of the economy and increasing productivity. The CBN established the ABP with a view to collaborate with anchor companies (Off-takers) involved in the production and processing of key agricultural commodities and incorporated the concept of value chain. The programme involves a comprehensive risk mitigation strategy which involves the identification and selection of SHFs, grouping the out growers (SHFs) into viable cooperatives. The key players that are involved in the programme are; CBN, Off-takers, Insurance company, States ADPs, Commercial bank/Bank of Agriculture and SHFs (Beneficiaries of the programme).

2.1.2 Smallholder Farmers (SHFs)

SHFs are defined in various ways depending on the context, country and even ecological zone. Often the term ‘smallholder’ is interchangeably used with ‘small-scale’, ‘resource poor’ and sometimes ‘peasant farmer’. In general terms smallholder only refers to their limited resource endowment relative to other farmers in the sector. SHFs are also defined as those farmers owning small-based plots of land on which they grow subsistence crops and one or two cash crops relying

almost exclusively on family labour. One of the main characteristics of production systems of SHFs are of simple, outdated technologies, low returns, high seasonal labour fluctuations. SHFs differ in individual characteristics, farm size, resource distribution between food and cash crops, livestock and off-farm activities, their use of external inputs and hired labour, the proportion of food crops sold and household expenditure patterns (FAO 2015). These are some of the important behavioral features which are common to SHFs in many countries.

First, SHFs are entrepreneurs in a broad sense. They run their farms but are also involved in many other activities away from them, trying to make the best they can.

Second, they tend to farm intensively. They diversify their production according to their diet requirements, and keep most of the food they produce for in-house consumption as food markets do not function well. They use more fertilizer and seed per hectare than other farmers and rely heavily on family labour. In fact, family labour makes a difference: in developing countries, small farms are more productive than larger farms on a per hectare basis. But their productivity lags behind that of farmers in the developed world.

Third, most SHFs are poor and by seeking wage or self-employment in the rural non-farm sector, they try to both supplement and diversify their income sources to reduce risks. The jobs they choose are low skilled SHFs have very low education levels. In many countries, what they bring home from working away from their farms is little, and often it is as much as what they gain from farming their land. But the high poverty incidence suggests that non-farm activities could reflect income diversification strategies to cope with risk, rather than well-paid nonfarm employment.

Finally, only few SHFs use innovative technologies. The rest, either they have no access to them or they perceive them as risky. For many, even decisions on educating their children can shape

their choices on when to sell their produce. They sell when prices are at their lowest level just after harvest which coincides with the beginning of the school year in order to meet the cost of schooling.

2.2 Theoretical Literature

The study is tied to theories of production function, impact evaluation models and agricultural innovation adoption theories as relevant theories to the study.

2.2.1 Theory of Production

Production theory is the study of production, or the economic process of producing outputs from inputs. Production uses resources to create a good or service that suitable for use or exchange in a market economy. The production process involves the transformation of inputs into outputs. What is put into production process comes out either as a product or in the form of waste. The product is that part of the output that is valuable to the producer while that which has no value to him is the waste or waste product. Every production process therefore generates some waste products. As long as the production generates sufficient profit from the valuable part of the output, the investor is satisfied with the investment (Olukosi and Ogungbile, 1989).

In agriculture, inputs are usually classified into land, labour, capital, and management. These are usually coordinated by the producing unit whose ultimate objectives or goals may be profit maximization, output maximization, cost minimization, the maximization of satisfaction, or a combination of these motives (Olayide and Heady, 1982). In a production process, a relationship exists between the quantity of output produced and the quantity of inputs used. In other words, variability in the quantity of output is determined by the variability in the quantity of inputs used. The production function describes the technical or physical relationship existing between inputs and outputs in any production process. In mathematical terms, this function is assumed to be

continuous and differentiable thus, enabling us to estimate the rates of returns (Olayide and Heady, 1982). The production function takes many forms and has become one of the most widely used tools in economic analysis. The choice of any form will depend on its desirable characteristics. Griffins *et al.* (1987), suggested choice of functional form based on statistical and econometric criteria. These include the goodness of fit (R2), statistical significance of the regression coefficients and the correctness of the signs of the regression coefficients (Olayemi and Olayide, 1981).

Production theory is consider the bedrock for this study and this is due to the fact that the ABP tends to provide all the necessary inputs needed by the SHFs in the study area, thus there is need to examine the relationship between inputs and output (Production efficiency) and estimate the returns to scale.

2.2.2 Impact Evaluation Models

Impact as explained by the Organization for Economic Cooperation and Development (OECD, 2006) is the positive or negative, primary or secondary, long term or short term effects produced by a development intervention, directly or indirectly, intended or unintended. Emmauela, Gine and Markus (2008) defined an impact as the difference between outcomes with a program and those without it. Put in a simpler form, impact is what is obtainable with a program now compared with what used to obtain in its absence. Agricultural intervention projects such as ABP are expected to make impact on the beneficiaries whether positive or negative after a certain period of the project's intervention.

The United Nations Development Fund (UNDPF) (2003) defined impact as the overall long-term effects of an intervention resulting from a program/project that are assessed with reference to the development objectives or long term goals of that program/project. The UNDPF further stated that

impact is the long term or ultimate result attributed to a development intervention in contrast with output and outcome, which reflects more immediate results from the intervention.

Evaluation models, as Miller (2010) suggests, 'are intended to provide evaluators with the bases for making the myriad of decisions that are part of designing and conducting an evaluation. Evaluation models provide evaluators with certain perspectives and guidance on matters such as:

- The role of the evaluator and the relationship to the subject/s of the evaluation individuals and community.
- Selecting evaluation questions and matching with suitable methods.
- Participant selection.
- Informational needs, such as who will receive the evaluation findings and in what format.

A program evaluation is a 'rigorous, systematic and objective process to assess a program's effectiveness, efficiency, appropriateness and sustainability' (NSW Government, 2016). Further, program evaluations should always be undertaken with a view to informing decision making. This may include continuing, expanding, ceasing or refining a program (NSW Government, 2016). Program evaluations can be categorised as Outcome/Impact, Implementation/Process and Economic evaluations.

Alkali (2011) cited in Ajayi (1996) viewed the impact evaluation models as the various acceptable models of evaluating the impact of an intervention project. An impact evaluation assesses the extent to which a program has caused desired changes in the intended audience. It is concerned with the net impact of an intervention on households and institutions attributable only and exclusively to that intervention. Ken et al (1999) stated further that impact evaluation involves and analysis of cause and effect in order to identify impacts that can be traced back to interventions. Impact evaluation attempts to find out what would have happened in the absence of an intervention

program, what would have been the welfare levels of particular communities, households and individuals without the intervention.

This study therefore attempts to find out what would have been the welfare levels of the individuals, households and the entire communities in Zaria Local Government Area of Kaduna State without ABP intervention project.

Some of the models adopted in evaluating the impact of agricultural projects include the following:

2.2.2.1 Participant and Non-participant Model

Participant and non-participant model as explained by Alkali (2011) in Ken et al (1999) involves the comparative measurements of the effects of a project and determination of the cause and effect relationship in two groups of people; the treatment or experimental group subjected to a stimulus and the control group which received no treatment. Changes in the level or variables in the treatment group are then compared with the corresponding changes in the control variables. Mabawonku (1986) opined that one of the major conceptual issues in program evaluation is the comparative measurement of the project effect and the determination of the cause and effect relationship. The issue of whether the changes in the control group are of the same magnitude and dimensions as those in the treatment group.

A framework to classify participatory evaluation includes the following dimensions: control of the evaluation process, stakeholder selection for participation, depth of participation, and phase of participation (Stufflebeam & Coryn, 2014). The participatory approach is flexible in methodology and approach (Stufflebeam & Coryn, 2014). The evaluator, for instance, begins through the identification of users and participants from a broad range of stakeholders, and identifies what the different stakeholder groups expect from the evaluation.

These model is applied to this study, due to fact that in the ABP have the beneficiaries (treatment/experimental group) and the non-beneficiaries (controlled group) in which we take into account of the comparative measurement of the effects of the projects has on both groups.

2.2.2.2 Project Objectives, Project Inputs, Project Outputs, Project Effects, Project Impacts, and Project Beneficiaries (POIOEIB) Evaluation Model.

Alkali (2011) cited in Ajayi (1996) asserted that the POIOEIB model assumes that before the intervention of a development project in a given area, a base-line survey will be carried out in order to discover the needs of the area and thereafter, some achievable objectives will be developed by the project's management unit. The project inputs will generate certain project outputs which are the physical products expected to be produced from the project inputs in order to achieve pre-determined objectives. Some principles of this model will be applied in this work. The study will determine the objectives for which the project was established and find out whether the project inputs have generated expected outputs as provided for by this model.

The outputs that ABP was meant to generate include reduction of agricultural commodity importation, reduce level of poverty among peasant farmers, create jobs, assist rural farmers transformation from subsistence farming to commercial farming among others. The use of project's outputs (PO) by farmers is expected to generate certain effects, called project's effects (PE) which are the outcomes of the use of project's outputs over a period of time. Project effects could include more income, gain in time, improved quality of life, reduction in losses and larger markets. The adoption of project's outputs over a period of time will generate some types of socio-economic impacts (PI), being outcomes of the project effects on the farmers. The impacts expected to be generated by the ABP include among others the following; increased household material possession, more employment opportunities, increased income and increased productivity. The farmers who are directly involved in project's activities are called programme beneficiaries (PB).

They are the programme beneficiary farmers who are expected to adopt the improved systems, practices, technologies and innovations introduced by the project (Williams, 1984; Ajayi, 1996).

2.2.3 Theories of Agricultural Technology Adoption

Alkali (2011) cited in Rogers (1995) explains that there are four major theories that deal with the diffusion of innovations and these includes;

2.2.3.1 Innovation Decision Process Theory.

Innovation decision process theory is based on time and five distinct stages (Nutley et al, 2002). The first stage is knowledge i.e potential adopters must first learn about the innovation. Second, they must be persuaded as to the merits of the innovation. Third, they must decide to adopt the innovation. Fourth, once they adopt the innovation, they must implement it. Fifth, they must confirm that their decision to adopt was the appropriate decision. Diffusion results once these stages are achieved.

2.2.3.2 Individual Innovativeness Theory.

Nutley et al (2002) say the individual innovativeness theory is based on who adopts the innovation and when. A bell-shaped curve is often used to illustrate the percentage of individuals that adopt an innovation. Rogers (1995) also pointed out that as well as the determinants of adoption at the individual level, there are a variety of external or social conditions that may accelerate or slow the diffusion process such as:

- Whether the decision to adopt is made collectively, individually or by a central authority.

- The communication channels used to acquire information about an innovation, whether mass media or interpersonal.

- The nature of the social system in which the potential adopters are embedded, its norms, and the degree of interconnectedness.

- The extent of change agents'(advertisers, development agencies, etc.) promotion efforts. Of importance is communication, or rather the process where information is both created and shared in order to reach a mutual level of understanding between individuals. This provides the means by which information is transmitted between individuals and social systems creating the communication channel (Rogers & Scott, 1997).

2.2.3.3 Theory of Rate of Adoption.

The theory of rate of adoption suggests that the adoption of innovations is best represented by an s-curve on a graph (Nutley et al, 2002). The theory holds that adoption of an innovation grows slowly and gradually in the beginning, and then has a period of rapid growth that will taper off and become stable and eventually decline (Rogers, 1995). The Bass model suggests other representations (Robert-Ribes & Wing, 2004). Another aspect of importance is time. Innovations are seen to be communicated across space and through time. Time has been identified as being significant in the diffusion of innovations in three main ways (Rogers & Scott, 1997).

- Firstly, the adoption of an innovation is viewed as a mental process that evolves over time starting and initial awareness and initial knowledge about an innovation which evolves into an attitude towards that innovation. This influences the decision of whether to adopt of reject the innovation.

- Secondly, the rate of adoption amongst individuals differs throughout the social system. This starts of slowly with only a minority of people adopting the innovation increasing over time eventually reaching the rate where enough individuals have adopted the innovation and the rate of adoption becomes self-sustaining.

• Thirdly, time is involved in the rate of adoption or rather the relative speed that members of a social system adopt innovations. This is often measured as the number of members of the system that adopt the innovation in a given time period.

2.2.3.4 Theory of Perceived Attributes.

The theory of perceived attributes is based on the notion that individuals will adopt an innovation if they perceive that the innovation has the following attributes (Nutley et al 2002). First, the innovation must have some relative advantage over an existing innovation or the status quo. Second, it is important the innovation be compatible with existing values and practices. Third, the innovation cannot be too complex. Fourth, the innovation must have trial-ability. This means the innovation can be tested for a limited time without adoption. Fifth, the innovation must offer observable results (Rogers, 1995).

2.3 Theoretical Framework for the Study

As discussed earlier, this research work is anchored on a blend of synthesis of theory of production, impacts evaluation models and theories of agricultural adoption decision process. The ABP is an agricultural innovation programme introduced by the CBN in collaboration with States ADP and other stakeholders which provide agricultural credits (in kind and cash) to SHFs in the agricultural production. It's also encompasses the concept of value chain model whereby SHFs are trained, monitored by professionals and evaluation, guarantee sale of their harvest (market), investment opportunities, technical support etc. The theory of production simply involves the process of transforming inputs into outputs. It's the process of combining various material and immaterial inputs (plans and know-how) in other to create output which has value and contribute to the utility of individuals. The theory of production in this respects simply try to analyse how total yield or

output varies with the quantities of inputs used in the production process. SHFs have to decide the amount of production and amount and kinds of inputs to be used in production process.

The theory of agricultural innovation adoption simply tries to explain how individuals make decisions in the adoption of an innovation process and how it can result to agricultural improvement. As **the theory of decision process** is based on time and five distinct stages of decision process that involves: knowledge, persuasion, decisions whether to adopt, to implementation (if adopted) and to confirmation of the adoption about the innovation. The **Individual innovativeness theory** is based on who adopts the innovation and when. **The theory of rate of adoption** suggests that the adoption of innovations grows slowly and gradually in the beginning, then rapidly and became stable which eventually decline. **The theory of perceived attributes** is based on the notion that individuals will adopt an innovation if they perceive that the innovation must have a relative advantage over the existing one, compatible with the values and practices, not complicated and offer observable results.

The impact evaluation model assesses the change that can be attributed to a particular intervention, (such as the ABP which is an innovation). Impact evaluation is structured to answer the question: how would participant's well-being have changed if the intervention had not been undertaken? White (2006) stated that in order to understand what would have been project participant's conditions without the intervention there has to be a counterfactual analysis. That is a comparison between what actually happened and what would have happened in the absence of the intervention. Counterfactual analysis enables impact evaluators to attribute cause and effect between interventions and outcomes. Its measures what would have happened to beneficiaries in the absence of the intervention, and impact are estimated by comparing counterfactual outcomes to those observed under the intervention.

The impacts evaluation models will be adopted in developing a theoretical framework for this study because observations are made before and after on the participants and non-participants in the study area because of the intervention based on the set objectives and targets for which the project was meant to achieve during the planning and formation stage (Umeh, 2009) and a comparative analysis of the control and the experimental group subjected to a stimulus and the control group which received no treatment.

2.4 An Overview of the Anchor Borrower Programme

The ABP was launched by President Muhammadu Buhari (GCFR) on November 17, 2015 in Birni Kebbi, Kebbi state which was intended to create a linkage between anchor companies involved in the processing and SHFs of the required key agricultural commodities. The programme thrust of the ABP is provision of farm inputs in kind and cash (for farm labour) to SHFs to boost production of these commodities, stabilize inputs supply to agro processors and address the country's negative balance of payments on food. At harvest, the SHF supplies his/her produce to the Agro-processor (Anchor) who pays the cash equivalent to the farmer's account. The Programme evolved from the consultations with stakeholders comprising Federal Ministry of Agriculture & Rural Development, State Governors, millers of agricultural produce, and SHFs to boost agricultural production and non-oil exports in the face of unpredictable crude oil prices and its resultant effect on the revenue profile of Nigeria.

The Anchor Borrowers Programme (ABP) is one of the renewed ongoing efforts made by the Apex bank to revolutionize the agricultural sector. It was conceived out of the Central Bank of Nigeria (CBN) to resolve and achieve a strong and viable agricultural base economy with more integrated value chains, enhanced food security, reduce imports, eradicating poverty, diversification of the economy and increasing productivity. The ABP being an innovative programme that involves a

comprehensive package that is not only limited to credit component, but rather its involves other component like farming training, extension services, evaluation, closed supervision and guarantee market for harvest with investment opportunities. The ABP scheme is introduce to enable small household farmers to transform economically from subsistence farming to a commercial farming that will ultimately improve their welfare and the realisation of the farmer's self-actualization.

In Kaduna State, seven (7) off-takers were registered to participate in the 2016 farming and five (5) out of the seven (7) companies registered as off-takers in the CBN programme had participated only. About N2 billion was disbursed by the Central Bank of Nigeria to finance the ABP to an estimated number of 60,000 participants' farmers in Kaduna State. The Chairman of All Farmers Association of Nigeria, Alhaji Nuhu Aminu, disclosed this in an interview with the News Agency of Nigeria in Kaduna that the improved seeds and other farm inputs were being distributed to farmers to ensure maximum yield with minimal use of land for cultivation. He said the seeds, including maize, soya beans and rice, were distributed to farmers who registered to participate in the programme in the 2016 farming season. The five Anchor Companies that participated include Stallion, Nigeria Flour Mills Limited, ZIL, AFAN and Tukunyan Gwari.

Objective of the Anchor Borrower Programme

The broad objective of the ABP is to create economic linkage between SHFs and reputable large-scale processors with a view to increasing agricultural output and significantly improving capacity utilization of processors.

Other objectives include:

- Reduce agricultural commodity importation and conserve external reserves
- To reduce the level of poverty among peasant small holders farmer

- To create jobs
- Assist rural farmers to grow from subsistence to commercial production level
- To facilitate the emergence of a new generation of farmers and entrepreneurs
- Increase banks' financing to the agricultural sector
- Increase capacity utilization of agricultural firms
- Build capacity of banks, farmers and agricultural entrepreneurs

Training of Farmers, Extension Workers and Banks; Is also an implementation plan which involves training component customized value chains finance modules for banks and an "agribusiness" training protocol for farmers that is consistent the aspirations of the ABP. This is a bullet training mechanism that "bundles" Farm Business School (FBS), Good Agricultural Practices (GAP) and Cooperate Management in Coherent and seamless manner.

Out-grower Support Programme; Is an implementation plan under the intervention, the CBN has set aside the sum of N20.0 billion from the N220.0 billion Micro, Small and Medium Enterprises Development Fund (MSMEDF) for farmers at a single digit interest rate of 9.0 %. In addition, the major stakeholders in the agricultural value chain will work with financial institutions, including insurance industry and CBN, to create the linkages required to sustainably ramp up production.

Risk Mitigation; a comprehensive risk mitigation strategy has been incorporated into the ABP model. This includes the following below on:

Table 2.1 Comprehensive Risk Mitigation Strategy under anchor borrower programme

S/NO	RISKS	MITIGANTS
1	Poor farming technique/ low yield crop	Comprehensive farmers education

2	Skill gap among credit officers in agricultural financing	Value chain training for bankers
3	Poor monitoring of the process/project	Project Management Team (PMT), comprising all stakeholders , to effectively monitor implementation
4	Farmers have no commitment to the programme	Equity contribution of 5% - 10%
5	No market for products	Off-takers in place with MOUs executed
6	Price variation	Guaranteed Minimum Price by FMARD in place
7	Loss of corps due to flood/drought/natural disaster	NAIC Agricultural Insurance is compulsory
8	Poor quality of inputs leading to low yields	PMT selects recognized agro dealers
9	Diversion of funds by farmers	Direct disbursement to agro-dealers
10	Side selling by farmers	-Farmers selection by miller -Cross guarantee by all members of the cooperative -Millers approves all disbursement request by farmers -Use of extension workers -MOU to be executed between the millers, farmers and financing banks to curb the incidence of side-selling -The cooperative to which the erring farmer belong to be excluded from the programme and from future CBN funding
11	Default by miller -No funds to purchase paddy -Reneges on MOU agreement -Diversions of funds	-CACS funding available for direct purchase of paddy -Millers will be banned from future CBN funding -Bank debits Miller's account and credit loan account of farmer
12	Default on loan repayment by farmer	50% credit risk guarantee in the event of default
13	Challenges of infrastructure	Government to provide infrastructural facilities like Fadama feeder roads, irrigation facilities, etc.

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Dynamics of the Programme; the dynamics of the programme involves the following:

- Identification and selection of small holder farmer
- Grouping and registration of out-growers into viable cooperatives /clusters
- Determination of the economics of selection and engagement of financial institutions
- Execution of MOUs
- Capacity building of out-grower, banks staff and extension agents
- Opening of banks account by cooperatives/farmers
- Loan application and disbursement

- Commencement of agronomic practices and distribution of agro-inputs at recommended period (funds of agro-inputs are deducted from the loans and paid to the input suppliers)
- Fortnightly meetings to discuss development by Project Management Team

Mode of Operation

- One to five hectares of land to be allocated to farmers to each participant plant are expected to plant maize and soya beans on one hectare each
- land to be leased or purchase by the participant
- participant to open a loan account with a participatory bank
- participant must belong to a cooperative group
- participant must pay administrative fee
- cost of production is expected to be about N200,000/hectare to be sourced via input loan from the bank
- farmers are to sign a memorandum of Understanding (MOU) with the off takers that they are to repay their loan with their harvest
- Farmers will receive loan in form of agricultural input and only cash loan will be given to farmer for land preparation, clearing, planting and harvesting.
- Off takers are to supply farmers with farm inputs like seeds, fertilizer and chemicals

Key Stakeholders in the Anchor Borrowers' Programme. The operating model defines key roles, requirements and obligation of stakeholders in the Programme. The key stakeholders are broadly grouped as follows:

Table 2.2 Key Stakeholders under the Anchor Borrowers' Programme

S/No	Stakeholder	Roles, Requirements and Obligations
1	Central Bank of Nigeria	-to provide finance through the MSMEDF at 9% interest rate -coordinate the entire programme and serve as secretariat -chair the PMT

2	Nigeria Incentive based Risk Sharing System for Agricultural Lending (NIRSAL)	-to provide technical assistance to farmers, extensions and banks -serves as secretariat to the PMT -Organize farmers into cooperatives/groups
3	Nigerian Agricultural Insurance Corporation (NAIC)	-to provide insurance cover to the projects under the programme -serves as member to the PMT
4	Development Partners	-to provide technical assistance to farmers, extensions and banks -serves as secretariat to the PMT
5	Financing Institutions	-provide financing through the CBN MSMEDF at 9% interest rate per anum -disburse directly into cooperatives accounts and subsequently to individual farmers accounts -ensure that all payments due to are made on behalf of the farmers -serve as member of the PMT for specific anchor companies
6	Anchor Companies (Off-takers)	-identify and collaborate with CBN and NIRSAL to organize farmers into cooperatives -assists in identifying input suppliers for quality assurance -provide extension service expert to support and ensure achievement of the targeted yield -monitor harvest and facilitate full evacuation of produce -buy up produce at agreed price
7	Farmers/Out-Growers	- organize themselves into cooperatives and ensure credibility of members -cross-guarantee of one another and abide by the terms of the MoU -must be fully responsible for their farms and agree to work with the extension agents attached to them -sell all produce to the off-taker at an agreed price without side selling -abide with the agreed terms of lending and repayment through the loan cycle

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Targeted Beneficiaries; the loan shall be targeted at SHFs engaged in the production of identified commodities across the country. The Farmers should be in groups/cooperative(s) of between 5 and 25 for ease of administration.

Identified Agricultural Commodities; The targeted commodities of comparative advantage to the State shall include but not limited to: -Cereals (Rice, Maize, wheat etc.); Cotton, Roots and Tubers (Cassava, Potatoes, Yam, Ginger etc.); Sugarcane, Tree crops (Oil palm, Cocoa, Rubber etc.); Legumes (Soybean, Sesame seed, Cowpea etc.), Tomato, Livestock (Fish, Poultry, Ruminants etc.) and any other commodity that will be introduced by the CBN from time to time.

Formation of the Project Management Team (PMT)

- Verification of the farmers and farm sizes by the PMT
- Confirmation of participation by the Head Offices of the PFI(s)
- Identification of reputable agricultural inputs suppliers by the PMT
- Organization of Town Hall Meeting to agree on the economics of production per hectare, offtake price, signing of Agreement, and any other relevant issues. The meeting shall have in attendance all the stakeholders including the inputs suppliers.
- Signing of tripartite Agreement by the PFI, Anchor and the farmers
- Submission of loan applications from Head Offices of PFIs with the list of farmers in the prescribed format with accounts numbers, gender, farm size, BVN, Telephone numbers, cooperative name and LGA
- Registration of farmers on the National Collateral Registry (NCR).

Capacity Building of the Farmers; a mandatory training programme shall apply for farmers that will participate under the ABP covering;

- Farming as a business
- Improved agricultural practices
- Group management dynamics

The cost of such training shall be borne by the participating anchor. However, partnerships with Development Partners are encouraged on the training of the farmers. Certificates issued at the end of the training shall constitute a requirement for farmers to access credit facility in kind and cash under the programme.

Provision of Extension Services; the Anchor/State Governments shall be required to provide extension services to complement the training, ensure adherence to good agricultural practices and mitigate side selling.

Collateral under the anchor borrower programme; the following shall be collateral to be pledged by SHFs under the programme:

- Cross and several guarantee by farmers in cooperatives
- Tripartite Agreement signed by the parties
- Cross and several guarantee by farmers in cooperatives registered on the National Collateral Registry (NCR)
- Equity Contribution (minimum of 5%) by the farmers

Note: Participating farmers under the Programme must deposit the minimum equity requirement in their accounts with the Performing Institution before loan disbursement

- No input would be distributed to any farmer that has not provided the equity contribution
- Any PFI that contravenes this basic risk requirement would be sanctioned

Table 2.3 Infractions and Sanctions of Stakeholders involved in the anchor borrower programme

Stakeholders	Infractions	Sanctions
Participating Financial Institutions	1. Diversion of funds to unauthorized activities	-Amount diverted shall be recovered by the CBN. -Penal charge at the maximum lending rate of the PFI on the amount diverted. -Outright ban from participating under other CBN Interventions following another infraction
	2. Charging of un-authorized fees/interest	-Reversal of the charged fees/interest -Issuance of warning letter to the PFI -Outright ban from participating under other CBN Interventions after two infractions
	3. Charging of interest rates higher than prescribed	-Reversal of excess interest charged. -Penal charge at the maximum lending rate of the PFI -Issuance of warning letter to the PFI
	4. Failure to disburse funds within specified period to the borrowers	-Penal charge at the maximum lending rate of the PFI -Recovery of the undisbursed amount plus interest
Anchor	1. Failure to collect certified quality output from farmers after going into agreement as the Anchor to the farmers	-Anchor will cease to participate under the programme. -Anchor will not be allowed to access agricultural and other CBN interventions
	2. Failure to pay for collected proceeds within the specified time	-Anchor to bear the cost of accrued interest on the farmers' account from the due date
Small Holder Farmers (SHF)	1. Side-selling	-Total prohibition from all CBN interventions. - Prosecution and Blacklisting of the SHF by the CBN - -Payments of loans by the guarantors or cooperatives
	2. Input Diversion	-Blacklisting of the SHF on any intervention by the CBN -Repayment of the loan by the guarantors and cooperative members
	3. Refusal to Submit Commodities to the Anchor	-Blacklisting and Prosecution of the SHF by the CBN -Repayment of the loan by the guarantors and cooperative members
	4. Diversion of Funds	- Blacklisting and Prosecution of the SHF by the CBN -Repayment of the loan by the guarantors and cooperative members
Project Monitoring Team	1. Insider related contracts and inflation of contract figures	-Suspension/Prosecution of the culpable member(s) -Report the culpable member(s) to the relevant institution(s)

CBN (2016)

Benefits of investment

- employment opportunity and investment without stress with high return on investment
- guaranteed sales of harvest proceeds
- access to bank finance with single digit interest rate per annum
- training, direct supervision and monitoring by professionals

2.5 Review of Empirical Literatures

This section is concerned with the identification of all the interrelated observed investigations carried out by researchers in order to identify the impact of intervention development projects on the beneficiaries of the programme.

Dare *et al*. (2014), in their study examined the reality of the impact of Agricultural Development Programmes on rural dwellers in Nigeria, in Isan Ekiti, Oye LGA of Ekiti State as their case study, they investigated if the programme has brought about increase in the production of foodstuff, income level of farmers, improved seeds, provision of pesticides, and fertilizer for farmers. Using a survey study with questionnaire as the research instrument. A total of number of 773 questionnaires were analyzed using descriptive statistics involving percentage frequency distribution, pictorial representation, graphical illustrations and regression approach. The study hypotheses were tested using multiple linear regression analysis and the empirical result reveals that Agricultural Development Programmes have significantly increased food production in the locality through increased provision of pesticides and improved seeds to farmers, establishment of new infrastructure and provision of fertilizers. The study therefore recommends that government should increase its effort in the area of Agricultural credit financing.

Abarshi (2014) assessed the impact of Fadama programme on agriculture and poverty reduction among farmers in Bauchi state. A field survey design method was adopted and data collection

instrument were questionaires, interview, and focus group discussion. Data analysis were divided into; socio-demographic characteristics of the sample respondents, evaluation of the activities of the Fadama, analysis of the adoption farmers technologies, analysis of crop performance and profitability and analysis of poverty status of the sampled respondents. All these were conducted in the counterfactual to net out the programme effects (i.e dividing the sampled respondents into control and experimental groups for the purpose of making comparison). A total of 900 respondents were randomly selected and 824 responses were received and analysed consisting of 455 Fadama farmers and 369 non-Fadama farmers who were randomly selected through a multi-stage sampling techniques. Descriptive statistics and econometric modeling were used to access the impacts of the programme. Foster Greer Thorbecke (FGT) reveals lesser poverty ratio around beneficiaries than non-beneficiaries. Gross margin of the beneficiaries is higher than that of the non-beneficiaries. The study recommends rebasing extension, use of social networks and established religious and traditional institutions in disseminating, transformation and development information to farmers as well as public/private proactive support for Fadama user's community in the provision, monitoring and implementation of inputs support services for farmers.

Ayegba and Ikani (2013) studied the impact assessment of agricultural credit on rural farmers in Nigeria. Descriptive statistics, simple percentages, ratios and proportions were used to analyse the data collected. A total of 500 sets of questionnaires were forwarded to rural farmers in the six geopolitical regions of Nigeria but a total of 300 questionnaires were correctly completed, retrieved and analysed discovered that much is yet to be done to boost agriculture by encouraging farmers via adequate agricultural credit without strings. The result also shows that unregulated private money lenders constitute the major source of credit which is not healthy for an economy that is ready to grow. It was equally clear that the much needed banks in the rural areas are mainly

found in the urban areas leaving the rural farmers without formal sources of credit. The major limitations or challenges in accessing agricultural credit as found in the study include; high interest rates, bureaucratic bottlenecks, late approval of loans, unnecessary request for guarantors on collateral. They recommended that the government in collaboration with banks should create credit instruments and services that are tailored to the risk and cash flow patterns in the agricultural sector to avoid or reduce the level of the aforementioned challenges.

Ellis (2013) investigated the impact of micro credit on labour employed, working capital, output and income of farmers and other forms of rural banks support give to farmers within Sunyani area. A total of 103 farmers were randomly selected from farmer clients of a rural bank to respond to close-ended questions. Paired samples t-test was run to determine the differences and impact of the credit intervention on the four dependent variables. A modified Eta squared formula and paired samples correlations were used to determine the impact of the independent on the dependent variables. The result found significantly large effect of the micro credit intervention on the labour employed, working capital, output and income of farmers. All the dependent variables had increased during the period under study although all the increases cannot be attributed to the credit intervention only. Apart from the credit, other forms of support given to farmers include improved and subsidized farm inputs like fertilizer, seedlings and other inputs.

Simonyan and Omolehin (2012) assessed the impact of Fadama II project on income of beneficiary farmers in Kaduna state. Data were obtained from 206 project beneficiary and non-beneficiary farmers respectively. Net farm income, double difference method, paired t-statistics and chow test statistical tools were used for data analysis. The findings of the study showed that the net farm income of the project beneficiaries increases from N702,796.95 before the Fadama 2 to N709,492.52 after Fadama 2. There was also an increase in the net farm income of the non-

beneficiaries from N314,702.04 to N478,564.73 during the Fadama 2 project. The double difference result indicated a positive mean income difference between the beneficiaries and non-beneficiaries after the Fadama 2 project at 10% level of significance. Chow test analysis showed a significant change between the coefficients of the respondent's income implying that Fadama 2 project contributed positively to the increased income realized by the beneficiaries over that of non- beneficiaries. The study recommends intensive advisory services by the KADP Fadama 2 project on resource utilisation and other means of increasing farmer's beneficiary income.

Ike (2012) in his study "An Analysis of the Impact of Fadama III Project on Poverty Alleviation in Delta State, Nigeria" 152 participating households in Fadama III Project and 50 non-participating households were used as respondents. Data were collected through the use of well-structured questionnaire and analyzed through the use of Descriptive and Inferential statistical tools. The Double-Difference (DD) Estimator was used to compare changes in outcome measures. Findings revealed that the mean increase in income for participants in Fadama III was significantly different from that of non-participants at $p = 0.05$. The study recommends that the state government should make it mandatory for all the 20 LGAs participating in Fadama III project to pay their counterpart funds. Also, there should be appropriate policy to ensure proper education of rural populace is advocated.

Alkali (2011) in his study sought to determine the Impact of National Fadama Development Project Phase 2 on Rural Development in Kaduna state. The study adopted the survey research design. Structured questionnaire was employed as instrument for data collection. The population for the study was 12,430, made up of 12,177 Fadama project farmers (FPFs) and 253 Agricultural Development Projects Extension Agents (E.As) contracted as Fadama project facilitators. The sample of the study was 465 consisting of 415 FPFs and 50 EAs. Descriptive and inferential

statistics were used in analyzing the data collected. Specifically, the standard deviation, mean scores and the t-test statistic were employed for this purpose. Based on the adopted impact assessment model of before and After Project intervention, the t-test was used to compare the levels of availability of benefits before and after the project. Findings of the study revealed that infrastructural facilities were more available in the study area after the implementation of the project than before it was implemented. It was also revealed that the innovations provided by the project were at various levels of adoption. Also, findings on impact of the project on farm yield and farm income indicated that farmers recorded increases in their farm yield and income as a result of participation in the project. The study also revealed that there were positive changes in the living conditions of the rural farmers after project participation. It was therefore recommended that policies aimed educating rural farmers should be adopted as illiteracy seems to be the major restriction to farmers adopting modern and better farming practices, Government should be more serious in implementing policies aimed at revamping agriculture by avoiding unnecessary bottlenecks and politics. This would help in making sure all project benefits get to the target farmers.

Nguezet, Diagne and Ojehomon (2011) studied the Impact of Improved Rice Technology on Income and Poverty among Rice Farming Household in Nigeria. Instrumental Variables (IV) based estimator was used to estimate the Local Average Treatment Effect (LATE) of the adoption of the new variety on income and poverty reduction. Cross sectional data of 481 farmers from the three major rice ecologies of Nigeria namely upland, lowland and irrigated. The study concludes that there was a positive and significant impact of the adoption of the improved variety on farm households' income and welfare measured by per capita expenditure. The study suggests that

intensification of investment on the new variety is a reasonable policy instrument to raise income and reduce poverty among rice farming households.

Afor (2011) evaluated the farmer's livelihood diversifications strategies under the Fadama programme in Kebbi State Nigeria. He examined the socio economic and institutional factors influencing livelihood diversification. A multi-stage sampling was used to collect information from 156 participating farmers under Fadama 2 program. Information was collected of income-earnings activities, livelihood dynamics and farm and non-farm incomes, among others. Tobit regression was used to establish relationship between farmer's socio-economic factors. The study found that age education, gender, labour, farm size, farming experience and household size were the determinants of livelihood diversifications and that the consistent factors influencing livelihood diversifications are education and farm size. Report of farm returns on four produce; rice, tomatoes, pepper and maize were N35, N772.5, N171.7 and N16,844.5 respectively. FGT indices reported 69% of farmers studied were poor; poverty gap index was 0.27% severity index revealed 18% of the farms living below the poverty line were very poor. The result also showed that age, level of education, crop income, farm size and household size significantly influenced poverty status of farmers. Identified problems with Fadama 2 are low level of education and training. The study recommends that Fadama programs should put more emphasis on capacity building and training participants.

Mohammed (2011) compared the costs and returns of rice production under rain-fed and irrigation methods in the Upper Benue River Basin on Dadin-Kowa, Gombe State. The study used both descriptive statistics and Gross Margin in analyzing the data. The study showed the mean age farming experience and farm size of the respondents was 59.84 years, 26.63 years and 0.35 years respectively. In both cases, labor constituted the major components of total costs of production

while sales of un-threshed rice were the major income component of the rain-fed (40.00%) and irrigated (45.00%) production methods. Moreover the per hectare gross margin per naira invested in the rain-fed production were N61,606.12 and 0.51 respectively; while in the irrigation method respective values were N100,889.00 and 0.78. Furthermore results revealed that water supply (83.33%), extension activities (78.90%) and canal maintenance (70.27%) were the most satisfied services while fertilizer supply was the least as indicated by the respondents. The study concluded that both the production methods were profitable, through the irrigation was more profitable and recommended both methods but prefers irrigated in alternative situations.

Adeola *et al*. (2011) in their study estimated the productivity and profitability of cowpea production in Kaduna State. A multi-stage random sampling method was used to select 150 cowpea farmers who were interviewed for the study. Information on the inputs used and output realized in cowpea production were collected from the farmer s using well-structured questionnaires. The data generated from the information collected were subjected to various analyses using the production function analysis model, total factor productivity (TFP) and the gross margin equations. The coefficient of determination (R^2) of the regression was 83% with the coefficients of all the input variables (except fertilizer) significant different levels. The TFP shows that the combined factor inputs used in cowpea production in the study area has a positive effect on cowpea output. Cowpea production in Kaduna state was profitable with a gross margin of N13584594. It was also found that the gross margin per hectare in cowpea production in the study area was N46, 090 while the return per Naira (N) invested was 45kobo. It was further discovered that inputs were inefficiently utilized. Suitable adjustment in the inputs used was recommended to further widen the profit margin.

Eze and Nwachukwu (2010) specifically sought to describe the socio-economic characteristics of the beneficiary and non-beneficiary of Fadama 2 farmers in Imo State. The study also sought to determine the poverty line, poverty incidence and poverty gap between the Fadama 2 and non-Fadama 2 farmers as well as to evaluate the effect of the programme on participant's farmer's income, output and farm size. A multi stage random sampling technique was used to select 240 (120 a piece for Fadama 2 farmers and non-Fadama 2 farmers) respondents from which input-output data were collected. The instrument of data collection was a set of structured and pre-test questionnaire. The study employed the mean frequency counts, poverty parameters and paired t-test statistics as an analytical tools. The results of the analysis showed that poverty incidence was 0.5367 and 0.3215 for Fadama 2 and non-Fadama 2 farmers respectively. The results of the paired t-test showed that the national Fadama 2 facility impacted positively and significantly on the beneficiaries' output level, income level and labor use level.

Anyanwu (2009) applying Ordinary Least Squares technique, studied the determinants of aggregate agricultural productivity among SHFs in Rivers State, Nigeria. Cross- sectional data generated from 288 food crop farmers randomly selected from 5 out of the 23 Local Government Areas were used. Results of the analysis showed that farm land, labour input, planting materials, age of the farmers, farming experience, and level of education are the main significant determinants of aggregate agricultural productivity in the State.

Shalma (2009) using a purposive sampling technique evaluates the diffusion of an improved used of technological innovation of Soya bean Production under Sasakawa Global 2000 Project. A total of 107 Sasakawa maize farmers were employed, using a well-structured questionaires. The data were analysed using descriptive statistics, gross margin analysis and stochastic frontier function. The results showed that the mean age of the farmers was 49 years. Majority of respondents (89%)

were literate and most of them (78%) cultivate on small scale farms (0.1-1.0ha) and 62% had access to credit facilities while 74% were not members of any cooperative group. Soya bean production under Sasakawa project was found to be profitable as the gross margin of N240, 952/ha was achieved. The mean efficiencies were 89%, 73% and 65% for technical, allocative and economic efficiencies hence there is room for improvement of the farmers' efficiencies to increase outputs. Farm size, quantity of seeds and quantity of fertilizer had positive effects on both technical and economic efficiencies just as costs of farmland, seeds, fertilizer, agrochemicals, labour and output were seen to have positive effects on allocative efficiency.

Umeh (2009) carried out a study on the Socio-Economic Impact of the ECOWAS Fund Accelerated Artisanal Fish Production Project on fisher folk in Delta state. The population of the study comprised of all the heads of Artisanal Fisher Folks (AFFs) households in the state and the field extension officers assigned to the fishing communities in the state. Multi-stage sampling technique was used in obtaining a sample for the study. Data were collected through the use of interview schedule and analyzed by the use of percentages, mean score, t-test statistics and factor analysis with varimax rotation. The finding indication that 38% of the beneficiaries were informed about the program through cooperatives/self-help groups, 13.3% through the media while the remaining 13.3% got their information through friends/relatives. This indicates that majority did not get information about the program directly from extension agents hence most of the AFFs were not properly informed about the project. The result also indicated that project beneficiaries obtained loans through NACRDB officials (29.2%), project officials (35.8%) and cooperative officials (35.0%). About 15% of the loan beneficiaries had not repaid even part of the amount while 29.0% had repaid at least half of the amount given as loan.

Nwachukwu *et al.* (2008) carried out a Rapid Policy Appraisal of the Second National Fadama Development Project in Nigeria. The researchers used the propensity score matching and double difference methods to control for project placement and self-selection biases. They found out that Fadama phase-2 reduced beneficiaries' distance and travel time to the nearest town and reduced the waiting time and fares for transportation services relative to non-beneficiary households in Fadama 2 Local Government Areas. Household access to productive assets increased dramatically, especially for the poorest households, largely because of the subsidy provided to help finance acquisition of such assets. Household incomes improved substantially more for Fadama 2 beneficiaries than for non-beneficiaries, with an average increase in real income resulting from participation in Fadama 2 of about 60%, well above the target of at least 20% increase in income that Fadama 2 set to achieve in six years for 50 of the beneficiaries. About 42% of the beneficiaries increased their incomes by at least 20% within one year of Fadama 2 implementation, indicating that the project nearly succeeded in achieving its income goal within the first year of operation. The findings also identified constraints to the success of Fadama to include political maneuvers, lateness in disbursement of inputs, inadequate publicity among others.

Oyaide (2006) evaluated the impact of extension on maize farmers by comparing contact and non-contact farmers with respect to farm size, productivity per farmer and farm yield. The contact farmer enterprise was treated as "with the investment package" and non-contact farmers enterprise as the "without the investment package". His findings showed that contact farmers performed relatively better than non-contact farmers in all the areas assessed.

Also a study on the impact of ADP extension services on poultry farmer's productivity in Owan West Local Government Area of Edo state was carried out by Onemolease (2005). The study made use of the survey research design with 178 respondents using the questionnaire as an instrument.

Data analysis technique employed was the standard deviation, mean scores and t-statistic. The findings revealed that the extension services provided by ADP had positive and significant impact on productivity of poultry farmers.

Osuntogun, Oni and Oluro (1984) adopted the survey research design and the questionnaire as the instrument for the study in comparing the adoption (fertilizer) performance of the contact and noncontact farmers. The researchers found out that the former achieved higher adoption (66%) than the later (35%). Moreover expenditure of the contact farmers on fertilizer was significantly higher. In addition it was noted that contact farmers performed better than non-contact farmers in adoption of other farm chemicals (herbicides/insecticides) with 11% to zero percent respectively.

Other Countries Case Studies.

Sinyolo, Mudhara and Wale (2014) conducted an investigation on the impact of smallholder irrigation on household welfare in South Africa. The study employed both descriptive and econometric techniques. Descriptive analysis was performed using the t-test for continuous variables and $\chi 2$ test for categorical variables. The Foster Greer Thorbecke (FGT) poverty indices were also used to give a summary of the incidence, depth and severity of poverty in the study area. Using a sample of 251 farmers, this study found that the treatment effect model indicated that access to irrigation plays a positive role in the welfare of rural households. The study, therefore, concluded that government investments in smallholder irrigation for poverty reduction are justified. The study recommends that investments in smallholder irrigation should continue for poverty reduction, and that priority should also be on finding other feasible rural micro-projects and development initiatives to complement smallholder irrigation and significantly reduce rural poverty.

Ibrahim and Bauer (2013) analyzed the impact of micro-credit on rural farmers' profit taking a case of Dryland of Sudan employing the Heckman Selection Model to analyze the responses from 300 samples. The findings from the study affirm the fact that farmers with access to credit are better off compared to those who do not have such access. The study recommends that by increasing the size of the loan, efficient and sustainable technology can be made available to farmers to increase farm profits.

Mariam *et al*, (2011) analyzed "The impact of Agricultural Innovation Systems interventions on rural livelihood outcomes in Malawi' attempted to assess the extent to which the use of these innovative agricultural research interventions impact upon the livelihood outcomes of rural SHFs in Africa using a case study from the central region of Malawi. Using propensity score matching as a means of establishing a valid counterfactual and single differencing to measure impact, the study establishes that rural incomes are significantly impacted upon by agricultural research interventions that are driven by agricultural innovation systems concepts. The study however further finds that although participating households had better livelihood outcomes and more diversified income portfolios during the implementation of the innovative research intervention as a result of greater linkages to markets and capacity building opportunities; phasing out of the research program reduced the diversity of income portfolios and lead to the erosion of livelihoods. The study therefore concluded that agricultural research interventions that are driven by agricultural innovation system concepts have the potential to positively impact upon the livelihood outcomes of rural SHFs in Africa. However there is need for greater capacity building of local extension agents and increased budgetary support to ensure understanding and application of agricultural innovation systems concepts by local level public agricultural extension agents to sustain positive livelihood outcomes.

Bacha *et al.* (2011) conducted a study in the Ambo district of Eastern Ethiopia in 2006 to understand the poverty to reduction impacts of small scale irrigation development, using the Indris irrigation system as a case study. The study was based on a survey representative farm household with and without access to irrigation. The total sample size for the study was 222 (107 households with access to irrigation and 115 without). Data were analyzed using descriptive statistics and Foster, Greer and Thorbecke poverty indices and Freidman's selectivity model. Results indicates that the incidence, depth and severity of poverty are significantly lower among those farm size, livestock holding size, land productivity and family are significantly influence the level of household consumption expenditure. However, the proportion of poor people in the overall sample, now withstanding access to irrigation is alarmingly high, indicating the deep rooted and critical situation of poverty in rural Ethiopia.

Verner and Verner (2005) investigated the Economic Impact of the Labor Force Training Program in the Informal Sector of Côte d'Ivoire revealed a mixed result among the chosen sectors. The data collected are a subsample of the participants in three selected sectors, namely the agricultural sector, tailoring sector, and the electronics sector, and a comparable comparison group of nonparticipants. By the use of standard econometric tools developed for this kind of data, namely "difference-in-difference" (or double difference) estimators, the data have been analyzed in order to detect potential program impacts. The conclusions drawn were that positive economic impacts are found for some groups as a result of training received, namely the agricultural and electronics sectors, while no impact were found tailors from participating in the programme. The study recommended that allocation of public funds should be done on a competitive basis (i.e., with public vocational training institutes competing with private institutions) can reduce costs and

increase responsiveness of public spending on skills development. Also, there is need for linking subprojects better with other projects and interventions.

Marouf (1992) studied the socio-economic factors influencing the profitability and adoption of new cropping patterns in an effort to recommend suitable measures in enhance crop diversification programme in Mahaweli System B, Sri Lanka. The adoption of new cropping patterns in Sri Lanka is determined by number of interrelated and mutually reinforcing factors. Hence, a multidisciplinary approach was used in this study to show the different attributes of the new cropping patterns and farmers decision making environment. The analytical methods include Marginal Cost-Benefit analysis, Multivariate analysis of Variance, Factor analysis and Logit Probability model. Result of marginal cost-benefit analysis indicates an increase in current crop yields and output prices may be necessary to increase the profitability of new cropping patterns to a recommendable level. Factors analysis show that there is a wide variation between the adopters and non-adopters which can be explained by four factors; namely, management factor, social factor, farm resource factor and farm stability factor. A logit probability model indicates that availability of farm loans significantly increases the probability of the adoption of new cropping patterns. The study results showed that crop yield, output prices, availability of farm loans and farmers beliefs, are the dominant factors influence the adoption new cropping patterns in Sri Lanka.

To appraise the impact of the Indian government's Lab-to-land program (LLP), on farmer's adoption level, Chowdburrty and Dasgupta (1989) adopted a comparative study approach. Adoption level between two farmer group, one group being members of a crop production enterprise of LLP and the other being a control group of similar sample size of 75 were compared. Based on the adoption index constructed, the authors found out that the program had positive

impact on farmer's adoptions as 62.66% of the farmers within the crop enterprise belonged to the higher category of adopters as against 6.66% of members of the control group.

2.6 Gap in the Literature

The ABP is relatively a new concept and currently there is no attempt made at evaluating the impact of the services provided by the ABP on farm yield (output and profitability level) of the beneficiaries, quality of life of the small household farmers (poverty status), farmer's real income in the study area, thus there is need to evaluate its impacts because it has incorporated the concept of value chain and value chain in agriculture can encourage farmers in the sense that it's provide credit (in cash and kind), its guarantees market for the farmers output, supervision and monitoring by professionals, technical support etc. which makes the activities of the ABP unique from the previous agricultural programmes.

This study therefore seeks to bridge this research gap by focusing on the impact assessment of the Anchor Borrower Programme on smallholder farmers in Zaria local government area of Kaduna state because it is an innovative programme. The literatures reviewed have guided this research in the selection of the appropriate methodology for this study.

CHAPTER THREE

3.0 Research Methodology

This chapter consists of information of the study area, analytical framework for the study, research design, sources of data, population and sampling techniques etc.

3.1 The Study Area

The study was carried out in Zaria Local Government Area (LGA) of Kaduna State. Zaria (LGA) is dominated by wet season planting and an irrigated dry season planting. Most farmers currently produce cereal crops such as maize, sorghum, millet and rice during the rainy season. Zaria LGA is politically composed of thirteen (13) council wards which include; Dambo, Dutsen-Abba, Gyallesu, Kaura, Kufena, Kwarbai A, Kwarbai B, Limancin-Kona, Tukur-Tukur, Tudun-Wada, Unguwan-Fatika, Unguwan-Juma, and Wuciciri.

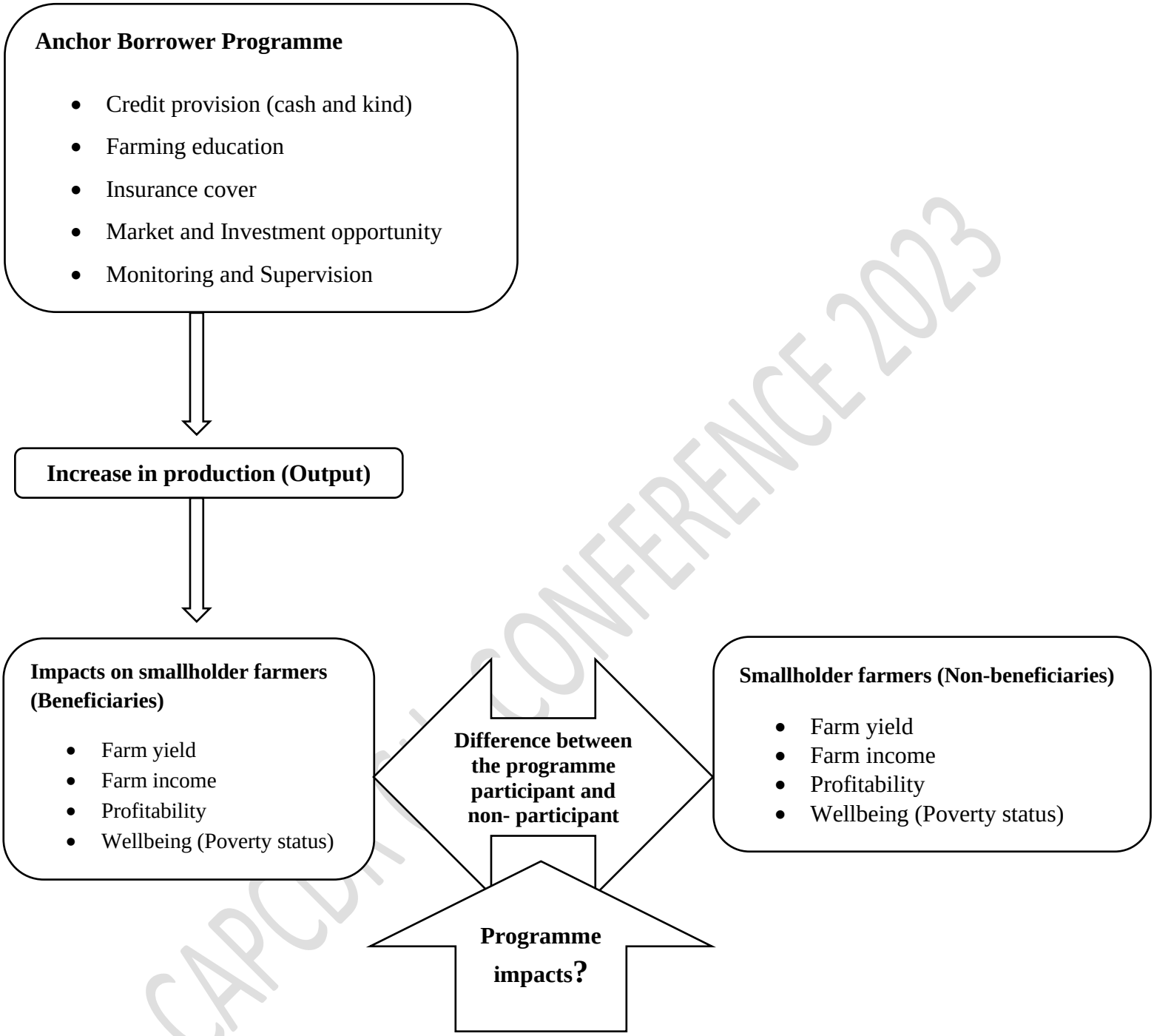
Figure 3.1 depicts the map of the twenty-three (23) LGA of Kaduna state with an arrow pointing the study area.

Figure 3.1: Map of Kaduna State twenty three (23) Local Government Area.

3.2 Conceptual Framework for Analysis

The conceptual framework for the assessment of the anchor borrower programme on maize SHFs in Zaria LGA of Kaduna state, involves the use of a counter-factual analysis which was adopted from Rubin-Causal model (1974) also known as the Neyman–Rubin Causal model, which is an approach to the statistical analysis of cause and effect based on the framework of potential outcomes. The participant and non-participant models was used because of its ability to make comparative measurements of the effects of the project intervention and determination of the cause and effect relationship in two groups of farmers; the treatment/experimental group subjected to a stimulus and the control group which received no treatment. Changes in the level or variables in the treatment group are then compared with the corresponding changes in the control variables.

The framework below depicts the flow charts of the activity of the ABP that includes the various agricultural innovations introduced by the programme and shows how the relationship between the cause and effect variables; the cause variable is the ABP while the effects are the set of social variable of the beneficiaries' income, output, profitability and poverty status. The conceptual framework for the analysis depicts the relationship between ABP and agricultural production. It is also expected that the intervention of the ABP will translate into improvement in agricultural output, income, profitability and wellbeing of its beneficiaries as represented in figure 3.2.



Source: Author's Conception 2019

Figure 3.2: Conceptual framework for accessing the impacts of the anchor borrower programme on maize SHFs.

3.3. Models (Analytical Techniques)

The analytical technique adopted for this study is based on the objectives of the study. They include; descriptive statistics, Cobb Douglas production function (input-output analysis), Gross Margin analysis (Profitability analysis) and Poverty analysis (Forster Greer-Thorbecke index).

3.3.1 Production Models (Inputs and Output Analysis)

The production function describes the technical or physical relationship existing between inputs and outputs in any production process. Production function relates the maximum amount of output that can be obtained from a given number of inputs as represented in the equation below:

$Q = f(X_{1+}X_{2\ldots}X_n)$…….3.1

Where, Q represents output and $X_{1+}X_{2\ldots}X_n$ represents the combination of inputs. In mathematical terms, this function is assumed to be continuous and differentiable thus, enabling us to estimate the rates of returns and efficiency of production. Following Bashir et.al (2010), this study adopted the generalised Cobb Douglas Production Function (CDPF) for the purpose of input-output analysis. The selection of CDPF was made on the basis of: it can handle multiple inputs in its generalised form; in the presence of imperfections in the market it does not introduce distortions of its own; and various econometric estimation problems like serial correlation, heteroscedasticity and multicolinearity can be handled adequately and easily. Further, it facilitates computations and has the properties of uniformity, representability, and flexibility. This technique do has some weaknesses including inflexibility and except for one obvious assumption all other assumptions can be relaxed (Bhanumurthy, 2002).

The following equation represents CDPF for this study;

$Y = AX_1^{\beta 1}X_2^{\beta 2}\ X_3^{\beta 3}X_4^{\beta 4}\ X_5^{\beta 5}e^U$ …….3.1.1

Where;

Y = (output) = Output/yield (kg/hectare)

X_1 = (labour) = quantity of actual labour used per man day/hectare

X_2 = (seed) = quantity of seed used kg/hectare

X_3 = (fert) = quantity of fertilizer used kg/hectare

X_4 = (herb) = quantity of herbicides used kg/hectare

X_5 (=abp) = dummy for ABP (0 for non-beneficiaries and 1 for beneficiaries)

e = base of natural logarithm and U = stochastic random error term or disturbance time

Log-linearizing and adding a stochastic term to (1)

$\ln Y = \beta 0+\beta 1 \ln X1+\beta 2 \ln X2+\beta 3 \ln X3+\beta 4 \ln X4+\beta 5 \ln X5 +Ut$……3.1.2

In more convenient terms,

ln_output=lnA+ ln_labor+In_seed+ln_fert+ln_herb+abp+Ut……3.1.3

The β's (except β_5) are the output elasticities with reference to a particular input consideration that show the marginal increment in the yield of output/yield from the increment in input and are expected to bear a positive sign with them. Thus, β_5 measures the impact of the quantity ABP on the output/yield.

3.3.2 Profitability Analysis (Gross-Margin)

Profitability for both ABP beneficiaries and non-beneficiaries in the study area will be analysed by the use of Gross Margin (GM). The GM is calculated as monetized values of variables inputs and incidental production costs which will be subtracted from gross revenue to arrive at GM estimates. This will be calculated as:

GM = TR – TVC ……..…… 3.2

$C = f(Q)$…….…….3.2.1

$\Pi = P*Q - (X_1+X_2 \ldots X_n)$……..... 3.2.2

Where; GM = Gross Margin. TR = Total Revenue i.e Output of harvest (maize) sales which will be calculated for both beneficiaries and non-beneficiaries of the farmers revenue and as such it will depends on farmers category. TVC = the summation of monetary values of variables input used in the crop production i.e fertiliser, agro-chemicals, hired labour, planting materials and other miscellaneous farm expenses. Thus labour (man-days), chemical in naira values per liter, seeds (per kilogram) and fertilizer (per bag), and land clearing (man days worked) will be monetized for easy computation.

3.3.3 Poverty Analysis (Forster Greer-Thorbecke)

The measurement of poverty using the Forster Greer-Thorbecke (FGT) index was to ascertain the poverty status of the farmers after the intervention of the ABP. The estimates assumed the following equations:

3.3.3.1 Headcount index

This is the fraction of the population that lives below the poverty line. Its measures the proportion of the poor farmers in the study area, denoted as P_o stated as follows:

$P_o = \frac{N_P}{N}$ ----------3.3

Where; N_p is the number of farmer considered as poor and N is the total population

3.3.3.2 Poverty Gap Index

This measures the extent to which individual farmer on average fall below the poverty line. Specifically, poverty gap (G_i) represents poverty line (z) less actual income (y_i) for poor farmers express as follows:

$G_i = (z - y_i)$ ($y_i < z$) ----------3.4

Where; G_i = poverty gap, z = poverty line and y_i = average income of the poor farmers

Then poverty gap index (P_I) is presented as follows

$P_I = \frac{1}{N}\sum_{i=1}^{N}\frac{G_i}{Z}$ ----------3.5

3.3.3.3 Poverty Severity (Squared Poverty Gap) Index

This measures a weighted sum of poverty gaps as a proportion of the poverty line in such a way that more weight would be put on farmers that fall far below the poverty line. Squared poverty gap denoted as P_2 is formally written as

$P_2 = \frac{1}{N}\sum_{i=1}^{N}\left(\frac{G_i}{z}\right)^2$ ----------3.6

All these indices can be put as one family of measures as proposed by Foster, Greer and Thorbecke (1984), which is written

$P\alpha = \frac{1}{N}\sum_{i=1}^{N}\left(\frac{G_i}{z}\right)^{\alpha}$, $(\alpha \geq 0)$ ----------3.7

Where:

$P\alpha$ is a class of additively decomposable measures

α is the FGT index and takes the values of 0,1 or 2

Here, $P\alpha$ is replaced by P_0, P_1 and P_2 which denote headcount (incidence), depth and severity respectively.

3.4 Research Design

This study adopts a cross sectional survey design because it is considered suitable for this study as it sought to get the opinion of the beneficiaries about the impact of the ABP on SHFs in the study area at a specific point in time through the use of well-structured questionnaire as an instrument of data collection (primary data). Also, secondary data for this research deals with the information

which have already been generated and stored in texts and files. The instruments of secondary data were sourced from the Kaduna Agricultural Development Programme office, Central Bank Publications, Tukunyan-Gwari office (Off taker) including handbook data and information regarding the projects undertaken by CBN. Other sources of the secondary data used include reports, magazines, websites and other related materials.

3.5 Population of the Study

The population for this study comprises the small holder's farmers of Zaria local government area. The population has been broadly divided into two groups: small holder's farmer that benefitted from the ABP and small holder's farmer that has not benefitted from the ABP in the last wet farming season of 2016 in the rural areas of Zaria Local Government of Kaduna state with a total number of 715 beneficiaries registered maize farmers. However, due to delay accompanied in disbursement of funds and farm inputs among other problems encountered, only a total number 296 beneficiaries participated in the 2016 ABP in the study area as given by the Off-Taker (Tukunyan-Gwari).

3.6 Sampling Technique

The sampling technique used for this study is the Simple Random Sampling (SRS) in selecting the respondents that would answer the questionnaires. According to Odo (1992) SRS assumes all the elements in the population to be identified, having all the characteristics, symmetrical, same and similar. In applying SRS, the research randomly select the respondents to give equal opportunity to all the beneficiaries and the non-beneficiaries of the ABP that will be sampled out for the study.

3.7 Sample Size

The sample size is drawn from the beneficiaries of the ABP and non-beneficiaries of the ABP that are living in the study area with similar socioeconomic characteristics. A total population of 296 beneficiaries participated in the 2016 wet farming season registered in the study area.

The ever increasing need for a representative statistical sample in empirical research has created the demand for an effective method of determining sample size. Determination of sample size differs depending on the research design. For instance, survey research design requires huge sample size for the purpose of representation; in census, everyone in the target population is selected to participate in the study, hence the sample size is equal to the size of the target population; in experimental research design, with treatment and control groups, the sample size may differ in each group.

For the purpose of this research sample size determination formula for finite population ('known') is stated below as adopted by Krejcie and Morgan (1970) which is used by several research institutions including the Kenya project organization (KENPRO, 2013).

The formula for sample size determination is stated as follows:

$$S = \frac{x^2 NP(1-P)}{d^2(N-1)+x^2P(1-P)} \quad \text{……..3.8}$$

Where:

S = Required Sample size

X = Z value (e.g. 1.96 for 95% confidence level)

N = Population Size

P = Population proportion (expressed as decimal) (assumed to be 0.5 (50%)

d = Degree of accuracy (5%), expressed as a proportion (.05); It is margin of error

Calculation:

$$S = \frac{3.8416\ X\ 296(0.5)(1-0.5)}{(0.0025)(296-1)+ 3.8416(0.5)(1-0.5)} = \frac{1137.11\ X\ 0.25}{0.7375+0.9604} = \frac{284.2775}{1.6979}$$

S = 167.4288 = 167.

To simplify the process of determining the sample size for a finite population, Krejcie & Morgan (1970), came up with a table using sample size formula for finite population as shown in Appendix III.

Note that; you can use a particular population proportion based on established statistics of the population you are targeting. You may also opt to use the standard population proportion of which is the maximum sample size one can select from a population. But for this study 50% (0.5) of the sampled population which is equal to 84 respondents observed for the control group (Non-beneficiaries of the ABP).

3.8 Data Collection Instrument

Questionnaire was the major instrument for data collection. The questionnaire was structured to collect data from the beneficiaries and non-beneficiaries of the ABP as the respondents. It was design to seek for information from the respondents such as socioeconomic distribution information of the respondents, sources of earning, revenue and income of the respondents, access to health care and education and so on. The questionnaire was administered to the heads of the cooperative to share among its respective members. The questionnaire was administered by the researcher with the aid of research assistant(s).

CHAPTER FOUR

4.0 PRESENTATION OF RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter presents the results of the findings. The analysis and presentation of the results are in line with the study objectives. The findings include that of the socioeconomic characteristics of the respondents, the ABP farming innovations introduced, production analysis, profitability analysis and poverty analysis.

In all, about 251 questionnaires were distributed and 234 questionnaires were retrieved. From these numbers, 167 questionnaires were distributed to the beneficiaries (experimental group) and 156 questionnaires were retrieved while 84 questionnaires were distributed to the non-beneficiaries (control group) and 78 questionnaires were retrieved.

The distribution and retrieval of the questionnaires for the beneficiaries and non-beneficiaries of the ABP among SHFs is summarized and presented in table 4.1.

Table 4.1 Distribution and Retrieval of Questionnaires

Smallholder Farmers	Questionnaire Administered	Questionnaire Retrieved	Questionnaire not retrieved
Beneficiaries of ABP	167	156	11
Non-beneficiaries of ABP	84	78	6
Total	**251**	**234**	**17**

Source: Field Survey, 2018

4.1 Socio-economic Characteristic of the Respondents

This section presents the analysis of the socio-economic characteristics of the small household farmers and this includes: gender, age, marital-status, occupation etc.

Table 4.2.1 Distribution of Respondents by their Characteristics

	Beneficiaries		Non-Beneficiaries	
	Frequencies	**Percentages (%)**	**Frequencies**	**Percentages (%)**
Gender				
Male	135	86.5	78	100
Female	21	13.5	0	0
Total	**156**	**100.0**	**78**	**100.0**
Age				
No response	3	1.9	0	0
15-30	38	24.4	18	23.1
31-45	82	52.6	54	69.2
46-60	26	16.7	6	7.7
61 and above	7	4.5	0	0
Total	**156**	**100.0**	**78**	**100.0**
Marital Status				
No response	1	6	0	0
Single	28	17.9	8	10.3
Married	119	76.3	70	89.7
Divorced	5	3.2	0	0
Widowed	3	1.9	0	0
Total	**156**	**100.0**	**78**	**100.0**
Religion				
Islam	140	89.7	78	100
Christianity	16	10.3	0	0
Others	0	0	0	0
Total	**156**	**100.0**	**78**	**100.0**

Field Survey, 2018

From Table 4.2.1, in the Gender distribution majority of the respondents in the experimental groups were male. For instance small household farmers of the beneficiaries are about 86.5% were male and 13.5% were female. While all of the non-beneficiaries farmers were 100% male. The reason for male dominance is because of the cultural settings of the study area, whereby most economic activities are carried out by male. This finding concurs with the study of Ike (2012) and Tijjani (2017).

Concerning the age of the respondents, the age group of 31-45 is the dominant group among the respondents with about 52.6% for the beneficiary's farmers and 69.2% for the non-beneficiaries. This age group is followed by the age bracket of 15-30 among all the respondents, while age

bracket of above 60 had the least proportion of respondents. This implies that ABP farming projects offered greater opportunity for the youth and that provided better potentials for farming in terms of labour force. According to Adeola (2010), young people tend to withstand stress, put more time in agricultural operations which can lead to increased output. This has achieved one of the objectives of the ABP to target the youthful age as majority of the beneficiaries are within the age bracket.

On marital status, about 76.3% of the beneficiaries and 89.7% of the non-beneficiaries were married. This shows that majority of the beneficiaries were married. However, the analysis also revealed the proportion of single among the respondents 17.9% and 10.3% of the beneficiaries of the non-beneficiaries respectively. The widows have least proportion of about 1.9% beneficiaries and 0% for the non-beneficiaries. By implication, ABP intervention projects favoured those that are married which could attest to the high level of responsibilities in terms of household tasks shouldered on them.

On religion, the results revealed a higher proportion of Islam over Christianity in the beneficiaries' category about 89.7% as against 10.3% respectively. While among the non-beneficiaries, Islam has 100% dominance over Christianity. This analysis shows that majority of the respondents were Muslims and this was as result of the customary setting in the study area.

Table 4.2.2 Distribution of Respondents by their Characteristics

`	Beneficiaries		Non-Beneficiaries	
	Frequencies	**Percentages (%)**	**Frequencies**	**Percentages (%)**
Occupation				
No response	2	1.3	1	1.3
Agriculture	70	44.9	23	29.5
Civil Servants	35	22.4	19	24.4
Artisans	11	7.1	20	25.6
Others	38	24.4	15	19.2
Total	**156**	**100.0**	**78**	**100.0**
Level of Education				
No response	2	1.3	0	0
No formal Edu.	37	23.7	11	14.1
Primary Edu.	31	19.9	31	39.7
Secondary Edu.	32	20.5	16	20.5
Tertiary Edu.	54	34.6	20	25.6
Total	**156**	**100.0**	**78**	**100.0**
Household Size				
No dependents	34	21.8	10	12.8
1-5	51	32.7	26	33.3
6-10	35	22.4	33	42.3
11-15	23	14.7	8	10.3
16-20	9	5.8	1	1.3
Above 20	1	0.6	0	0
No response	3	1.9	0	0
Total	**156**	**100.0**	**78**	**100.0**
Farming before ABP in 2016				
No response	4	2.6	2	2.6
Yes	72	46.2	69	88.5
No	80	51.3	7	9
Total	**156**	**100.0**	**78**	**100.0**
If yes above, state years of farm experience				
No response	89	57.1	12	15.4
1-5	13	8.3	19	24.4
6-10	23	14.7	29	37.2
11-15	8	5.1	16	20.5
Above 16	23	14.7	2	2.6
Total	**156**	**100.0**	**78**	**100.0**

Field Survey, 2018

From Table 4.2.2, the respondent's distribution on occupation revealed that about 70% of the beneficiaries and 29.5% of the non-beneficiaries are engaged in agriculture activities in the study area which has the highest dominance followed by others 24.4% in the beneficiaries' category and Artisans 25.6% among the non-beneficiaries category. Distribution of respondents based on level

of education shows that a higher proportion of the respondents have attended various level of formal education ranging from primary education to Tertiary education put together to about 75% beneficiaries and 85.9% non-beneficiaries. This means that majority of small household farmers have diff5erent educational background which can be used to improve on their productivity.

The household size of the beneficiary's range of 1-5 has the highest proportion of 32.7%, followed by 6-10 with a proportion of 22.4%. While in the non-beneficiary category household size of 6-10 recorded a higher proportion of 42.3% followed by the house hold size of 1-5 with a proportion of 33.3%.

Concerning the respondents' distribution of whether they participate in farming prior to the commencement of the ABP, about 51.3% of the beneficiary's category answered NO which implies that the ABP engaged a large proportion of the respondents into farming which was in line with the programme objectives to create new employment opportunities in the diversification of the economy. Majority of the non-beneficiaries of about 88.5% were already engaged into farming activity.

4.2 Description of the Innovations introduced by the Anchor Borrower Programme

This section focuses on analyzing some of the innovations introduced to the beneficiaries under the ABP in the study area.

4.2.1 Credit Innovation

The credit innovation provided by ABP is represented in table 4.3.

Table 4.3 Distribution of Respondents on Credit innovations

Respondents Distribution	Frequencies	Percentages (%)
Type of loan received by the beneficiaries	**156**	**100**
Amount of cash loan received	**156**	**100**
Farm inputs received	**156**	**99.4**
Was the loan given sufficient and convenient to cover farming activity		
No response	14	9
Yes	60	38.5
No	82	52.6
Total	**156**	**100**
Was any problem encountered in the course of seeking the loan		
No response	2	1.3
Yes	144	92.3
No	10	6.4
Total	**156**	**100**
If Yes, identify some of the challenges encountered		
No response	7	4.5
Late disbursement of farm inputs and cash loan	146	93.6
Others	3	1.9
Total	**156**	**100**
Are you comfortable with following credit conditions		
No response	6	3.8
Loan to be paid back with farm proceeds with interest charged on loans at single digit rate	150	96.2
Total	**156**	**100**

Source: Field Survey, 2018

From table 4.3, the programme provided credit to all participants in both cash and kind which shows that most of the beneficiaries had received a uniform amount of both cash loan and farm inputs loan that is equivalent to N137, 550 per hectare in maize production in the study area through the anchor company as revealed in a 100% and 99.4% respectively. The respondent's proportion on the whether the loans given to the beneficiaries were sufficient and convenient, about 38.5% responds to YES that the loans were sufficient and convenient. While 52.6% responds to NO meaning that the loans were not sufficient and convenient while the remaining proportion did not respond.

Also, 92.3% reveals that there were problem encountered in the course of seeking out the loans which is significant and only about 6.4% did not encountered any problem in the course of seeking

out the loan. Most of the problem or challenges encountered were attributed to the late disbursement of cash loans and farm inputs to the beneficiaries as shown in a proportion of 93.6%. This setback however led the participants to resort to their personal savings and borrowings outside the programme in other to carry out the farming activity at the appropriate time. Participants are expected to pay interests on the loans given to them at the end of harvest with farm proceeds to the anchor company, about 96.2% agreed that loan to be paid back with farm proceeds and the interests on loans are to be charged at a single digit rate (9% interest rate) and just a small proportion of 3.8% were indecisive.

4.2.2 Insurance

Table 4.4 respondent's distribution on insurance innovation introduced by the ABP.

Respondents Distribution	Frequencies	Percentages (%)
Were you insured against any form of loss		
No response	34	21.8
No	122	78.2
Total	**156**	**100**
If yes, how much were you charged?		
No response	156	100
Total	**156**	**100**
Do you experience any kind of farm loss during your farming activity?		
No response	11	7.1
Yes	117	75.0
No	28	17.9
Total	**156**	**100**
If yes above, select the kind of loss experienced		
No response	40	25.6
Natural disaster and Pest and disease attack	110	70.5
Others	6	3.8
Total	**156**	**100**
Were you compensated for your loss		
No response	32	20.5
Yes	3	1.9
No	121	77.6
Total	**156**	**100**
If yes how much?		
No response	156	100
Total	**156**	**100**

Source: Field Survey, 2018

From table 4.4, it reveals the respondents distribution on the insurance innovation under the ABP, about 78.2% of the respondents were not insured which simply implies that a there is a significant proportion of the beneficiaries' farmers' were not insured. The reason for the disproportionate participation in the insurance scheme is attributed to the late disbursement of the loans, thereby resulting to the insurance scheme to back out of the ABP in other to avoid high risk of compensation to the farmers.

Also, 75.0% experienced farm losses, 17.9% managed to succeed in the farming without any kind of farm loss, while just 7.1% were indecisive (No response). The result also revealed that among those that experienced farm loss, about 74.3% experienced natural disaster (early cessation of rainfall) and pest and disease attacks. For example, a farmer in Kwarbai B ward who farm outside the study area in Karau-karau located under Giwa local government experienced early cessation of rainfall thereby leading to low farm yield. Other participants that witnesses incidence of pest and disease attacks that almost took all there maize farm are located in the district ward of Unguwan Juma, Limancin Kona, Kaura, Unguwan Juma, Tukur-Tukur and Unguwan Fatika even though their farm is located outside the study area. The result also revealed that about 25.6% were indecisive. Since farmers were not insured, no compensation was made to the beneficiaries' farmers.

4.2.3 Marketing Innovation

The prior arrangement of marketing under the ABP was that the Offtaker (Anchor company) will provide the markets to the beneficiaries farmers proceeds at the end of farming harvests at an agreed price of ₦ 12,000 per bag in which the part of the sales of the harvest will be for the repayment of the loans given to the farmers and with a 10% equity share investment in case profits is realized.

Table 4.5 Distribution of Respondents on marketing innovations under ABP

Respondents Distribution	Frequencies	Percentages (%)
Are you comfortable with marketing arrangements under the ABP		
No response	2	1.3
Yes to all marketing arrangements under the ABP	154	98.7
Total	**156**	**100**
What was the predetermine price?		
₦12,000	156	100
Total	**156**	**100**
Was the predetermine price by ABP fair?		
No response	11	71
Yes	126	80.8
No	19	12.2
Total	**156**	**100**
Was there any variation between ABP price and the ruling market price		
No response	14	9.0
Yes	10	6.4
No	132	84.6
Total	**156**	**100**
What quantity of your harvest was given to offset the loan		
No response	11	7.1
0-5 bags	2	1.3
6-10 bags	81	51.9
11-15 bags	62	39.7
Total	**156**	**100**
How do you get information about your equity share investment		
No response	151	96.8
Quarterly or Annually	5	3.2
Total	**156**	**100**
How do you get access to your return one equity share investment		
No response	151	96.8
Bank and Others	5	3.2
Total	**156**	**100**

Source: Field Survey, 2018

From table 4.5, majority of the respondents agreed with the marketing arrangement of the ABP as represented by 98.7%. A proportion of 80.8% agrees on the price fixed by the ABP as fair, the result also revealed that the price variation between the predetermined price by the ABP and the ruling market price was in-significant as it is represented by a smaller proportion 6.4% which agrees that there is NO variation in the price.

On loan repayments, the initial agreement was to offset the loans with 12 bags of maize but however, due to the low yield and other challenges the farmers faced, the Offtaker reduced it to 10

bags of maize in other to cover cost. About 51.9% of the beneficiaries realized output ranging from 6-10 bags, while about 39.7% realized proceeds ranging from 11-15 bags. This simply implies a significant short in the repayment of the loans by the beneficiaries despite the reduction made by the Offtaker from 12 bags to 10 bags as majority of the beneficiaries could not meet up with the required outputs.

The 10% equity share investment on profits made on the sale of farm proceeds was also a failure which is represented by 93.6% because the farmers did not realized enough yield to pay the loans and even those beneficiaries that managed to offset the loans, their proportion was not enough to take the 10% equity share investment and so that arrangement was not actually implemented.

4.2.4 Monitoring and Evaluation Services

Table 4.6 Distribution of Respondents on monitoring and evaluation innovations

Respondents Distribution	Frequencies	Percentages (%)
Do you receive any team for monitoring		
No response	6	3.8
Yes	137	87.8
No	13	8.3
Total	**156**	**100.0**
If yes above, what kind of farming activity do they monitor		
No response	13	8.3
Land preparation	113	72.4
Planting of seeds	7	4.5
Fertiliser application	21	13.5
Harvesting	2	1.3
Total	**156**	**100.0**
In which period do they send their teams for monitoring		
No response	13	8.3
Before planting time	106	67.9
During planting time	34	21.8
During harvesting	3	1.9
Total	**156**	**100**
State how often they visited your farm land		
No response	19	12.2
Once	118	75.6
Twice	11	7.1
More than twice	8	5.1
Total	**156**	**100.0**

Source: Field Survey, 2018

From the table 4.6, about 87.8% beneficiaries received monitoring team which was significant while 8.3% did not received any monitoring team and 3.8% did not respond this simply means that there is the presence of monitoring. In respect of what farming activity they monitor, 72.4% were monitored during land preparation at the beginning of the farming activity, 4.5 % during planting, 13.5% were monitored during fertiliser application and only 1.3% were monitored during harvesting which a major point of concern as the beneficiaries experience low farm yield. The prior arrangement of the monitoring activity by the Offtaker was to monitor in all the stages of the farming activity. From the result above, there was high presence of the monitoring at the early

stage of the farming while at remaining stages, there was minimal or no monitoring activity by the Offtaker and this was due to the shortage of personnel (extension officers).

To further access the monitoring periods, 67.9% were monitored before planting time, 21.8% was during planting period while 1.9% was at the time of harvest. Also, for the number of times they visited the farming activities, 75.6% were visited once, 7.1% were visited twice, 5.1% were visited more than twice while 12.2% did not respond. Even though there was monitoring, it was not significant especially at the time of farm harvest which may contribute to the shorts experienced in the repayments of loan.

4.2.5 Extension Services and Farming Techniques

Extension services and farming techniques to the beneficiaries are part of the ABP package.

Table 4.7 Distribution of Respondents on Extension services and Farming techniques under the ABP.

Respondents Distribution	Frequencies	Percentages (%)
Do you undergo any form of training prior to the farming activity		
No response	7	4.5
Yes	130	83.3
No	19	12.2
Total	**156**	**100.0**
For how long were you trained prior to the farming activity		
No response	26	16.7
Less than a week	75	48.1
1 week	41	26.3
2 weeks	7	4.5
> 2 weeks	7	4.5
Total	**156**	**100.0**
If yes above, was the training beneficial		
No response	15	9.6
Yes	119	75.6
No	23	14.7
Total	**156**	**100.0**

What was the form of training process		
No response	24	15.4
Farm field demonstration	5	3.2
Training in a workshop	127	81.4
Total	**156**	**100.0**
What was the form of training process		
No response	24	15.4
Farm field demonstration	5	3.2
Training in a workshop	127	81.4
Total	**156**	**100.0**
What did you benefit from the training		
No response	32	20.5
Planting, weeding, ridging, storage, harvesting.	124	79.5
Total	**156**	**100.0**
Some of the farming techniques introduced by the ABP		
No response	34	21.8
Cropping pattern, Seed spacing, weed control, planting time.	122	78.2
Total	**156**	**100.0**

Source: Field Survey, 2018

From table 4.7, about 83.3% partake in training prior to the farming activity which is significant, 12.2% did not partake in any form of training by the ABP while the remaining 4.5% did not respond. The result also revealed that among those that were trained, 75.6% agree that the training was beneficial, 14.7% testifies that it was not beneficial while 9.6% did not responds. In regards to the period taken for the training, 48.1% testifies that the training was just for a less than a week, 26.3% were trained for a week while about 9% were trained for 2 weeks or more and 16.7% did not respond. About training usefulness, 88.5% testifies that it was useful, 3.2% was very useful while 11.5% was not useful at all and 15.4% did not respond.

The result from the form of training innovation introduced, it reveals that 81.4% were trained in a training workshop, 3.2% were trained in farm field demonstration and 15.4% did not respond. Other results the types of training introduced was a proportion of 79.5% benefitted from planting, weeding, ridging, harvesting, storage, and 20.5% did not respond. Its reveals that among the

farming techniques introduced are cropping pattern, seed spacing, weed control, planting time which has a proportion of 78.2% while 21.8% did not respond.

4.3 Input-Output Analysis (Cobb Douglas Production Model)

This section analyses the inputs-output using Cobb Douglas production function.

Table 4.8: Results of the Cobb-Douglas Input-Output analysis

Variables	Beneficiaries				Non-beneficiaries			
	Coef.	**Std.error**	**t-stat**	**P-value**	**Coef.**	**Std.error**	**t-stat**	**P-value**
llabour	0.418986	0.199024	2.11	0.037	0.834734	0.289368	2.97	0.004
lseed	0.145962	0.261883	0.56	0.578	0.327615	0.2624574	0.12	0.901
lfert	0.165232	0.169136	0.98	0.330	-0.328278	0.3354062	-0.98	0.331
lherb	0.403287	0.222795	1.81	0.072	0.257674	0.1645936	1.57	0.122
C	-0.38301	0.445848	-0.86	0.392	0.190070	0.6007173	0.32	0.753
E/Parameter	1.466693	-	-	-	1.209334	-	-	-
R/Scale	1.13347	-	-	-	1.091745	-	-	-

Stata Version 14.0

From the table 4.8, the estimation result of the Cobb Douglas production function shows that regression result is significant as shown by the zero probability value of F-test. Also the coefficient represents the elasticity due to the logged variables and the use of rate of change. The coefficients were exponential coefficient because of the use of the Cobb Douglas production analysis. All the variables for the beneficiaries under consideration have the expected signs except seeds and fertiliser. The inputs labor is significant at less than 5 percent level of significance which explains by the use of labor intensive as an attributes to small household farming and herbicides is significant at less than 10 percent level of significance. However, seeds and fertilizer are not statistically significant even at 10 percent and they did not bear the expected signs. The reason for such is attributed to late disbursement of farm inputs by the off takers as the beneficiary farmers were not able to meet up with the appropriate time for the application of fertiliser and also the

seeds given were not of good quality as some got decayed even before they are been planted. Thus, this affects the extent of which some farmers might have been efficient in their production that will ultimately enhance their productive capacity. However the computation of the return to scale for both the beneficiaries and non-beneficiaries are experiencing increasing return to scale. In terms of production efficiency, the efficiency parameter of the beneficiaries is higher than the non-beneficiaries which was as a result of the invention of the ABP to the beneficiaries.

4.4 Gross Margin Analysis (Profitability Analysis)

In determine the profitability analysis of the sampled respondents, the Gross Margin analysis is used to compare the beneficiaries with the non-beneficiaries in the study area in other to evaluate farm production profitability. The Gross Margin represents the positive difference between the total revenue and total variable cost of production (Adeola et al. 2011) which makes it possible to ascertain profitability of farm activities of the two farmers' categories.

Table 4.9: Gross Margin Analysis

Farmers	Beneficiary (N= 156)	Non-beneficiary (N= 78)
Total Revenue	₦23,664,000.00	₦8,731,450.00
Total Variable Cost	₦21,457,800.00	₦7,253,900.00
Gross Margin	**₦2,206,200.00**	**₦1,477,550.00**

Source: Field Survey, 2018

Table 4.9 reveals that at the programme participation level, small household farmers that participated in the ABP have a higher gross margin more than the non-beneficiaries of the ABP. The beneficiary's gross margin (profits) is **₦2,206,200.00** while the non-beneficiaries gross margin (profits) is **₦1,477,550.00**. This can further be represented with an average mean of **₦14,142.3** for the beneficiaries to **₦18,942.9** for the non-beneficiaries. The minimum profit

margin obtained by a beneficiary is **-₦41,550.00** while for the non-beneficiaries is **-₦74,150.00.** The maximum profit margin for a beneficiary is **₦78,450.00** as against **₦100,350.00** for the non-beneficiary as represented in Appendix III.

Variable costs for the two farmer's categories are slightly different and the reason for the slightly higher difference of the non-beneficiaries' net farm average mean income over the beneficiaries is attributed to the late disbursement of farm inputs by the anchor companies (off takers) and the quality of the seeds given to the beneficiaries.

4.5 Analysis of Poverty Status of the farmers

This section analyses the poverty status of the sampled beneficiaries and the non-beneficiaries small household's farmers in the study area.

Table 4.10 Incomes and Poverty Status of Small Household Farmers

Index	Beneficiaries	Non-beneficiaries
Mean Annual Income	**₦ 81,962.82**	**₦ 87.083.97**
2/3rd of Mean Income	**₦ 54,641.88**	**₦ 58,055.98**
1/3rd of Mean Income	**₦ 27,320.94**	**₦ 29,027.99**
Headcount Index		
Core Poor	9.62%	12.82%
Moderate Poor	42.95%	19.23%
Non-Poor	47.44%	67.95%
Poverty Gap Index		
Core Poor	0.1103 (11.03%)	0.1216 (12.70%)
Moderate Poor	0.0817 (8.17%)	0.08733 (8.73%)
Poverty Severity		
Core Poor	0.0697 (6.97%)	0.1211 (12.11%)
Moderate Poor	0.0385 (3.85%)	0.4197 (4.20%)

Source: Author's Field Survey, 2018

From the table 4.9, the proportion of farmers with mean annual income (poverty line) greater or equal to 2/3rd of their respective average annual income was considered as non-poor which shows that 47.44% and 67.95% were considered as non-poor for the beneficiaries and non-beneficiaries respectively. Farmers with mean annual income less than 2/3rd but greater than the lower poverty line (1/3rd of their average annual income) were considered as moderate poor as represented in 42.95% and 19.23% as considered as moderately poor for the beneficiaries and non-beneficiaries respectively. While a proportion of farmers with mean annual income below the lower poverty line was among the core poor (extremely poor) as 9.62% and 12.82% are also considered as extremely poor for the beneficiaries and non-beneficiaries respectively. This situation implied high poverty incidence among the beneficiaries than the non-beneficiaries, as the proportion of the poverty incidence is higher among the beneficiaries than the proportion of non-beneficiaries.

Poverty Gap Index (FGT_1) shows poverty indices of the core poor the ABP intervention to be 0.1103 and 0.1216 among the beneficiaries and non-beneficiaries respectively and the indices of averagely poor to be 0.08173 and 0.08733 among the beneficiaries and non-beneficiaries respectively. This implies that moderately poor were 8.17% below the poverty line among the beneficiaries and 8.73% among the non-beneficiaries, while core poor were 11.03% worse among the beneficiaries and 12.7% worse among the non-beneficiaries. In order to get out of poverty, an averagely poor among the beneficiaries need additional income of 8.17%of ₦81,962.82 (₦6,696.36) annually and a core poor has to mobilize financial resource of about 11.03% more of ₦81,962.82 (₦9,779.10) than it was needed for the moderate poor. Similarly, a moderate poor among the non-beneficiaries need additional income of 8.73% of ₦87,083.97 (₦7,602.43) annually and a core poor has to raise fund of about 12.7% more of ₦87,083.97 (₦11,059.67) than it was needed for the moderate poor.

Lastly, FGT_2 revealed lower poverty severity among the beneficiaries than non-beneficiaries. The indices for the core poor was about 0.0697 (6.97%) the beneficiaries as against the 0.1211 (12.11%) among the non-beneficiaries, while the indices for the moderate poor was about 0.0385 (3.85%) among the beneficiaries as against the 0.4197 (4.20%) among the non-beneficiaries. Hence, the lower poverty severity among the beneficiaries implied that ABP intervention has contributed slightly towards improving poverty status of the beneficiaries.

CHAPTER FIVE
SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of the Major Findings

The ABP is renewed national agricultural programme aimed at improving the agricultural production and consequently the livelihood of the small household farmers. This study was set to investigate the impact of the ABP on the small household farmers on agricultural productivity and poverty status in the study area. Specifically, the study investigated the socio-economic characteristics of the beneficiaries, various innovation introduced by the ABP, the extent of adoption and implementation of the innovative activities, to analyse the impacts of the ABP on output, income and profitability as well as the welfare (poverty status) of the small household farmers in the study area.

The study adopted a cross sectional survey design employing the use a simple random sampling for the selection of samples to the study which was then divided into experimental and control groups. Using Krejcie and Morgan (1970) formula, a sample size of 156 farmers was drawn from the population of 296 beneficiaries of ABP intervention projects and 84 comparable groups of non-participants. Various statistical and analytical techniques were adopted for the analyses. These include descriptive statistics such as frequency tables, percentages, ratios accounting techniques such as the net farm income for the measure of profitability, FGT for the measurement of poverty in the study area.

The studies revealed that majority of the respondents were male that are within their youthful age. The ABP intervention projects favoured the married beneficiaries due to the high level of family responsibilities shouldered on them with a moderate household size of 1-5. Also, most of the respondents had attended at least primary school and tertiary level attained by the beneficiaries has

the highest. Agriculture was the dominant occupation followed by civil servants. The ABP succeeded in the creation of additional employment (income diversification) to the beneficiaries as new generation of farmers emerged under the programmes.

Analyses on the various innovation introduced by the programme and their extent of implementation shows that credit innovations revealed that most of the beneficiaries have received an equal amount of cash and farm inputs loans. Also majority complaint about insufficiency of the loans and the poor quality of the inputs given with significant problems encountered in the course of seeking out the loan.

The result on farming insurance was totally a failure as the majority of the farmers were not insured and a significant number of beneficiaries experienced loss and only few succeeded in the farming without incurring farm loss as they have resort to their personal savings and borrowings in other to finance the farming activities. The farm loss was attributed to the early cessation of rainfall, delay in the disbursement of cash and farm inputs and some incidence of pest and disease attacks. Also since there was no insurance cover, no compensation was made to the beneficiaries.

The result on marketing innovations introduced revealed that majority of the beneficiaries farmers are in support of the marketing arrangement of the ABP. The predetermine price was fair as compared with the prevailing market price. But however, the beneficiaries failed to meet up with the required quantity of their proceeds to offset their loans, repayment due to high incidence of farm loss. As they fall short with loan repayment, there was no evidence of any equity share investment for the beneficiaries.

Innovation introduced on monitoring and evaluation services revealed that there was a presence of monitoring and evaluation among the beneficiaries. It was significant at the beginning during land

preparation, followed by the time of fertiliser application and during harvesting, monitoring and supervision was very low monitoring. Mostly the beneficiaries were visited once at the beginning of the farming activity and minimal supervision at the end farming activity that is during harvesting which maybe contribute to the shorts experienced by the beneficiaries.

On farming extension services and farming techniques introduced by the programme results revealed that there was high presence of farm training prior to the commencement of farming activity. The result also shows that the training was highly beneficial and majority of the beneficiaries were trained for a week or less. The form of farming training introduced was through farm training in a workshop and some of the farming activities introduced are; seed planting, weeding, ridging, harrowing, harvesting and storage. On the farming techniques that were introduced by the ABP includes; cropping pattern, seed spacing, weed control and planting time.

The results on inputs-output analysis using the Cobb-Douglas revealed that all the variables for the beneficiaries have the expected signs with the exception of seeds and fertiliser because the seeds given was not of good quality and the inability of the use of fertiliser at the appropriate farming time due to the lateness in the disbursement of funds by the Off takers. Both beneficiaries and non-beneficiaries experienced increasing return to scale but beneficiaries have higher production efficiency parameter than the non-beneficiaries.

The gross margin for the farmers is different. Estimates of the gross margin for the non-beneficiaries farmers' net farm average mean income is slightly higher than that of the beneficiaries. This is also attributed to the lateness of the disbursement farm inputs and cash to the beneficiaries.

The results of the farmer's poverty status show that there is high incidence of head count index poverty among the beneficiaries farmers as is higher than that of the non-beneficiaries while the poverty depth and severity among the beneficiaries in the study area are low as compared to the non-beneficiaries in the study area.

5.2 Conclusion

From the analyses of the results in Chapter 4, this study has found out that the ABP intervention has the tendency of improving the agricultural production and the livelihood of the small household beneficiaries in the study area if farm inputs are disbursed at the appropriate time and the full implementation of the programme. The study has also identified some gap in the implementation (execution) of the programme, some of the innovations introduced by the ABP have not being implemented which results to some draw backs in the success of the programme in the study area.

Hence, if the ABP will be fully implemented at the appropriate time, there is a very high tendency for the beneficiaries of the programme to increase their agricultural production (output) as well as improving the overall livelihood and welfare of the programme beneficiary in the study area.

5.3 Recommendations

Based on the study findings, the following recommendations were made;

i. It is clear that the ABP has the tendency of reducing poverty among the small house farmers thus it will be of utmost important to implement all the farming innovations introduced by the programme at the appropriate time so that it can help small household farmers increases their farm productivity and reduce the level of poverty in the study area.

ii. Extensive farm field demonstration training should be encouraged in the programme in which the beneficiaries of the programme can experienced a practical example and application of the various farming innovations introduced by the programme in the field rather than just training in a workshop.

iii. There is the need to increase the frequency of the monitoring teams at the different farming periods of the farming activity and the rate of supervision of the farming activity should also be improved from the beginning to the end of the farming activity in other to close all loose gaps in the successful implementation of the ABP.

iv. The ABP has shown some potentials of a promising success among the beneficiaries of the programme despite the setbacks experienced on improving outputs and income, the programme should be extended to more communities and local governments in the state.

v. The ABP focused more attention on improving agricultural production without much consideration on other livelihood supportive social and infrastructural facilities such as good education and improved healthcare facilities. Therefore, more public schools and modern healthcare facilities should construct in the study area which will complement the programme objectives.

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APPENDICES

Appendix I: Questionnaires

Department Of Economics,

Ahmadu Bello University, Zaria.

Proposed Topic: Assessment of the Anchor Borrower Programme on Small Holder Farmers in Zaria Local Government Area of Kaduna State

Dear Respondent,

I am a post graduate student of the Department of Economics, Ahmadu Bello University, Zaria carrying out a study on: An Assessment of the Anchor Borrower Programme on Small Holder Farmers in Zaria Local Government Area of Kaduna State, Nigeria.

I humbly request you to fill in the enclosed questionnaire and any information provided will be kept confidential. Thank you for your support.

Questionnaire to the Beneficiaries of the Anchor Borrower Programme in 2016 Farming Season.

Section A: Socioeconomic Characteristics of the Respondents

1. Gender : Male ( ) Female ( )
2. How old are you? …….
3. Marital Status : Single ( ) Married ( ) Divorced ( ) Widowed ( )
4. Religion : Islam ( ) Christianity ( ) Others ( )
5. Occupation : Agriculture ( ) Civil servants ( ) Artisan ( ) Others ( )
6. Highest Educational No formal education ( ) Primary education ( )
   Secondary education ( ) Tertiary education ( )
7. Size of household ……
8. Are you a farmer before becoming a beneficiary of ABP? Yes ( ) No ( )
9. If Yes above, state the number of farming experience: …….

Section B: Agricultural Innovations introduced by the ABP:

Credit Innovations

10. Identify the type of loan you received from the ABP for the cost of maize production per hectare?
    a. Cash ( )
    b. farm inputs ( )
    c. both cash and farm inputs ( )
    d. none of the above ( )
11. If you have received cash loan, how much do you receive (Naira)? ……..

12. If you have received farm inputs loan, specify the type of farm inputs that was given to you.
   a. Seeds ( )
   b. Fertiliser ( )
   c. Herbicides ( )
   d. All of the above ( )
   e. Others (specify) ……
13. Was the loan given to you sufficient and convenient to cover the farming activity? Yes( ) No( )
14. Is there any problem encountered in the course of seeking for the loan? Yes( ) No( )
15. If Yes above, identity some of the challenges encountered in the options below:
   a. Late disbursement of farm inputs ( )
   b. Late disbursement of cash loan ( )
   c. Others specify ……..
16. Are you comfortable with the following credit conditions of the ABP;
   a. Loan to be paid back with farm proceeds ( )
   b. No side selling of the farm output ( )
   c. Loan should be charge at a single digit interest rate ( )
   d. Others specify…….

Insurance Innovation

17. Were you insured against any form of loss? Yes( ) No( )
18. If Yes, how much were charged for the insurance cover? …….
19. Do you experience any form of loss during your farming season? Yes( ) No( )
20. If Yes, select the kind of loss you experience during farming season
   a) Natural disaster ( )
   b) Pest and disease attack ( )
   c) Others (specify) …….
21. Were you compensated for the loss? Yes( ) No( )
22. If Yes, how much (Naira)? ……..

Market Innovation

23. Are you comfortable with the marketing arrangement of the ABP :
   a) To remit back all the proceeds to the ABP ( )
   b) To agree on the predetermined price given by the ABP ( )
   c) To enjoy a 10% equity share investment on profits made ( )
   d) All of the above ( )
24. Was the predetermined price by the ABP fair during the 2016 farming activities? Yes( ) No( )
25. Was there any discrepancy between the ABP price and the ruling market price? Yes( ) No( )
26. What quantity of your crops (kg/bags) was given to the ABP to offset the loan?
27. What is the predetermined price of the ABP (per bag)? …….....
28. How do you get information about returns of your equity share investment?
   a) Monthly ( )
   b) Quarterly ( )
   c) Annually ( )

29. How do you get access to your returns of your equity share investment? …….

Monitoring and Evaluation Innovation

30. Do you receive any team of monitoring by the ABP? Yes( ) No( )

31. If Yes above, what kind of farming activities do they monitor?

a) Land preparation ( )
b) Planting of seeds ( )
c) Fertiliser application ( )
d) Harvesting ( )
e) Storage ( )
f) Others (specify)……

32. In which period do they send their teams to monitor your farming activity?

a. Before planting preparation ( )
b. During planting preparation ( )
c. During harvesting period ( )
d. After harvesting period ( )

33. State how often they visited your farm for monitoring? ……..

Extension Services/Farming Techniques

34. Do you undergo any form of training before the commencement of the farming activity?
Yes( ) No( )

35. If yes above, was the training beneficial? Yes( ) No( )

36. State for how long you were trained before the farming season? …..……..

37. What effect did the training has on your farming activities?

a) Very useful ( ) b) Useful ( ) c) Not useful ( )

38. What was the form of training process, was it through

a. Farm demonstration on field ( )
b. Training workshop ( )

39. What did you benefit from the training process of the ABP?

a) Planting ( )
b) Ridging ( )
c) Weeding ( )
d) Record keeping ( )
e) Harvesting ( )
f) Storage ( )

40. Identify some of the farming techniques introduced by the ABP.

a. Cropping pattern ( )
b. Seed spacing ( )
c. Weed control ( )
d. Planting time ( )
e. Harvesting ( )
f. Storage ( )
g. Others (specify)……

Section C: Impact of the Anchor Borrower Programme on the household farmer's income, output and profitability level?

41. Please, specify the quantity/costs of each of the farm inputs used on maize production per hectare in the table below

Costs of Inputs	**Anchor Borrower Programme Intervention**		
	Quantity	**Unit Price (₦)**	**Total (₦)**
Labour per man day (ridging, harrowing, planting etc)			
Seeds (kg)			
Fertiliser (bags)			
Herbicides and Pesticides (liters)			
Miscellaneous expenses (transport, empty bags etc).			
2% NAIC Cost			
Total			

42. Are you satisfied with the quantity of inputs given by the ABP? Yes ( )No ( )

43. Was the inputs given to you by the ABP adequate? Yes ( ) No ( )

44. Please indicate the quantity of farm yield realized per hectare (in kg/bags) and the unit price of output per bag/ton (₦) in the table below

Anchor Borrower Programme Intervention	
Quantity of Output (bags/kg)	**Unit Price per bag (₦)**
Total	

45. Do you carry out any other business of your own apart from farming? Yes ( ) No ( )

46. How much do you get monthly from your work? (Naira)…….

47. How much do you receive monthly from sons, daughters or relatives each year? (Naira)……

48. What is your total income from all sources in a month (Naira) ……..

Questionnaire for the Non-Beneficiaries of the Anchor Borrower Programme in the 2016 Farming Season.

Section A: Socioeconomic Characteristics of the Respondents

1. Gender : Male ( ) Female ( )
2. How old are you? …….
3. Marital Status : Single ( ) Married ( ) Divorced ( ) Widowed ( )
4. Religion : Islam ( ) Christianity ( ) Others ( )
5. Occupation : Agriculture ( ) Civil servants ( ) Artisan ( ) Others ( )
6. Highest Educational : No formal education ( ) Primary education ( )
   Secondary education ( ) Tertiary education ( )
7. Size of household ……
8. Are you a farmer before the 2016 farming activities? Yes ( ) No ( )
9. If Yes above, state the number of farming experience (years): ……

Section B: Farming activity per hectare for maize production by smallholder farmers

10. Please, specify the costs of each of the farm inputs incurred on maize production per hectare in the table below

Cost of Inputs	**Quantity**	**Unit Price(₦)**	**Total (₦)**
Labour (per man day).			
Seeds (kg)			
Fertilizer (kg)			
Herbicides and Pesticides (liters)			
Miscellaneous expenses (transport, empty bags etc).			
Total			

11. Please indicate the quantity of farm yield per hectare (in kg/bags), the unit price of output per bag/kg (₦) in the table below

Quantity of farm yield per hectare		
Quantity of Output (bags/Kg)	**Unit Price per bag (₦)**	**Total (₦)**
Total		

12. Do you carry out any other business of your own apart from farming? Yes ( ) No ( )
13. If Yes, is your business marketing? Yes ( ) No ( )
14. How much do you get monthly from your work? (Naira)…….

15. How much do you receive annually from sons and daughters each year? (Naira)……

16. What is your total income from all sources in a year (Naira) ……..

17. Identify the sources of seed used for the maize production (per hectare)

a. At home ( ) b. Market ( ) c. Farmers association ( )

d. Others (specify) ……

18. Identify the kinds of seeds used for the maize production (per hectare)

a. improved seeds ( ) b. local seeds ( ) c. both improved and local seeds ( )

19. Identify the sources of farm labour used in the maize production (per hectare)

a. family ( ) c. hired labour ( )

b. tractor ( ) d. both family and hired labour ( )

20. Do you have access to extension workers? Yes ( ) No ( )

21. If Yes above, how frequent do you meet extension workers in a season?

a. weekly ( ) b. monthly ( ) c. seasonally ( ) d. others ( )

22. Do you have access to modern storage facilities to hoard farm produce after harvest? Yes ( ) No ( )

23. If yes above, who provides the storage facilities?

a. self ( ) c. farmers association ( )

b. government ( ) d. others (specify) …….

24. Who takes the decision on marketing of Maize produce?

a. self ( ) c. farmers association ( )

b. government ( ) d. others (specify) ……..

25. How do you market your maize proceeds at the end of the season?

a. self ( ) c. farmers association ( )

b. government ( ) d. others (specify) ……

APPENDIX II: Cobb Douglas Input-Output Results

Beneficiary Results

```
. regress ltotal llabour lseed lfert lherb
```

Source	SS	df	MS	Number of obs	=	156
				F(4, 151)	=	5.28
Model	1.96268162	4	.490670406	Prob > F	=	0.0005
Residual	14.033939	151	.092939993	R-squared	=	0.1227
				Adj R-squared	=	0.0995
Total	15.9966206	155	.103204004	Root MSE	=	.30486

ltotal	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
llabour	.4189861	.1990241	2.11	0.037	.0257545	.8122178
lseed	.1459626	.261883	0.56	0.578	-.3714656	.6633909
lfert	.165232	.1691362	0.98	0.330	-.1689471	.499411
lherb	.4032875	.2227953	1.81	0.072	-.0369112	.8434861
_cons	-.3830157	.4458481	-0.86	0.392	-1.263922	.4978905

Non-beneficiaries Results

```
. regress Total_Output_amount Labour_used_per_man_day seeds_used_kg Fertiliser_used_bags Herb_pestcides_used_Lts, tsscons
```

Source	SS	df	MS	Number of obs	=	78
				F(4, 73)	=	6.49
Model	25.8636225	4	6.46590563	Prob > F	=	0.0002
Residual	72.7517621	73	.996599481	R-squared	=	0.2623
				Adj R-squared	=	0.2218
Total	98.6153846	77	1.28071928	Root MSE	=	.9983

Total_Output_amount	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Labour_used_per_man_day	.8347345	.2809368	2.97	0.004	.2748283	1.394641
seeds_used_kg	.0327615	.2624574	0.12	0.901	-.4903153	.5558383
Fertiliser_used_bags	-.3282785	.3354062	-0.98	0.331	-.9967422	.3401851
Herb_pestcides_used_Lts	.2576741	.1645936	1.57	0.122	-.0703606	.5857087
_cons	.1900704	.6007173	0.32	0.753	-1.007157	1.387298

APPENDIX III: Gross Margin Analysis Result

	Beneficiaries	**Non-beneficiaries**
Mean	14142.30769	18942.94872
Standard Error	2236.486214	3681.291716
Median	6450	25850
Mode	6450	30100
Standard Deviation	27933.70386	32512.28811
Sample Variance	780291811.4	1057048878
Kurtosis	-0.141265586	0.24027906
Skewness	0.169798922	-0.181257643
Range	120000	174500
Minimum	-41550	-74150
Maximum	78450	100350
Sum	2206200	1477550
Count	156	78
Confidence Level (95.0%)	4417.926086	7330.388309

Microsoft Excel 2010

APPENDIX IV: Table for determining sample size for finite population

Table 3.1

Table for Determining Sample Size of a Known Population

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	354
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	361
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	1400	302	8000	367
55	48	190	127	440	205	1500	306	9000	368
60	52	200	132	460	210	1600	310	10000	370
65	56	210	136	480	214	1700	313	15000	375
70	59	220	140	500	217	1800	317	20000	377
75	63	230	144	550	226	1900	320	30000	379
80	66	240	148	600	234	2000	322	40000	380
85	70	250	152	650	242	2200	327	50000	381
90	73	260	155	700	248	2400	331	75000	382
95	76	270	159	750	254	2600	335	1000000	384

Note: N is Population Size; S is Sample Size *Source: Krejcie & Morgan, 1970*

APPENDIX V: Agreed Production Cost of Maize Farming (1 Hectare) Between Off-Taker (Tukunyan Gwari) and Farmers (Beneficiaries) of the Anchor Borrower Programme in the 2016 Farming Season.

FARM ACTIVITIES		UNIT	COST/UNIT (NAIRA)	TOTAL COST (NAIRA)
Land Preparation	Land clearing	1Ha	3,150	3,150.00
	Harrowing	1Ha	10,000	10,000.00
Farm Inputs	Seeds	20kg	400	8,000.00
	Fertilizer: NPK 15-15-15	6 bags	4,200	25,200.00
	UREA 46-0-0	2 bags	7,300	14,600.00
	Herbicides: Paraquat	6 liters	1,200	7,200.00
	Atrazine	3 liters	1,200	3,600.00
	Aflasafe	10kg	360	3,600.00
	Empty bags	45 bags	80	3,600.00
Operations/Labour	Planting	1Ha	6,000	6,000.00
	Fertiliser application(NPK)	1Ha	6,000	6,000.00
	Fertiliser application (UREA)	1Ha	2,000	2,000.00
	Herbicides application	1Ha	2,500x2	5,000.00
	Earthing up of soil	1Ha	10,000	10,000.00
	Harvesting	1Ha	8,000	8,000.00
	Cob-breaking/heaping	1Ha	4,000	4,000.00
	Threshing/100kg clean grain	1Ha	200x45	9,000.00
	Transportation	45bags	80x45	3,600.00
	Miscellaneous expenses (Transport)	1	5,000	5,000.00
Total Variable Cost	----------	1Ha	-	**₦ 137,550.00**
	2% NAIC	1Ha	-	2,751.00
	9% Interest TVC	1Ha	-	12379.50
	TOTAL COST	1Ha	-	**₦152,680.50**

Source: Tukunyan Gwari, 2016