

**AGRICULTURAL CREDIT AND FARM PRODUCTIVITY IN BICHI LOCAL
GOVERNMENT, KANO STATE, NIGERIA**

BY

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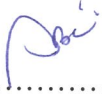
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**A THESIS SUBMITTED TO THE COLLEGE OF ECONOMICS AND MANAGEMENT
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DECLARATION

I declare that this thesis is my original work and has not been submitted for any other award of a degree or published at any institution of higher learning.



26 / 09 / 2018

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APPROVAL

This thesis has been submitted for examination with my approval as the university supervisor.



Dr. John Mutenyo

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Date

DEDICATION

I dedicate this piece of work to my Late Dad: Alhaji Ibrahim Abubakar Bichi and my beloved Mum Hajia Zainab Ibrahim. I love you all.

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LISTS OF ACRONYMS

MFIs	Microfinance Institutions
CBN	Central Bank of Nigeria
PAWDEP	Women Development Programme
GDP	Gross Domestic Product
NGOs	Non-governmental Organizations
SPSS	Statistical Package for Social Sciences
OLS	Ordinary Least Square

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ABSTRACT

This study set out to investigate the impact of agricultural credit on farm productivity for export in Bichi Local Government, Kano State, Nigeria. The study was guided by the following objectives: i) to determine the level of farm productivity in Bichi local government, Kano State, Nigeria, ii) to find out the common challenges faced by the local farmers in accessing agricultural credit from commercial banks in Bichi local government, and iii) to assess the effect of agricultural credit on the level of farm productivity in Bichi local government. The study used a sample size of 359 respondents. OLS regression was used to determine the effect of agricultural credit on farm productivity. The study revealed a high level of farm productivity with a yield as high as 60,000kg per 20 hectares of land. In addition to that, the study revealed a significant effect of agricultural credit on farm productivity (purpose of loan; $r=0.668^{**}$, $p<0.05$; loan amount, $r=0.648$, $p<0.05$). Furthermore, the most common challenges that affected loan access included among others, lack of collateral, high interest rate, complex bank systems and late approval. The study concluded that loan purpose and loan size contribute a significant effect on farm productivity. This is because using a right amount of loan for buying improved seeds, fertilizers, crop chemicals or irrigation contributed a great deal to the level of farm productivity. However, access to agricultural credit has often not been easy given the lack of collateral among farmers, high interest rate, complex bank system and late loan approval among others. This has often limited farmers to potentially be able to expand their production/productivity. The study recommended that in order to get maximum output, policies of commercial banks should be flexible and rate of interest should be less for small farmers than large farmers because small farmers hardly acknowledge their basic need. Similarly, efforts should be made to simplify the borrowing procedure in the terms of time-lag, acceptance of security, documentation and disbursement of loan.

CHAPTER ONE

1.0 Introduction

This chapter covered the background of the study, problem statement, purpose of the study, objectives of the study, research questions, and scope of the study as well as significance of the study.

1.1 Background of the Study

This section covered the historical perspective, theoretical perspective, conceptual and contextual perspective.

1.1.1 Historical Perspective

The history of agricultural credit has occurred since the First World War when farmers were the most vulnerable group of workers. The nature of farming did not allow for quick turn-around, particularly after farmers had made major investments in land, equipment, and crops (Azmi, 2011). Before the United States authorized a system of longer-term loans for farmers to reflect this reality, the lack of suitable credit forced many thousands of farmers to abandon their livelihood and its way of life. Losing so many family farms was not only a tragedy for farming families, but also for rural America (Azmi, 2011). This is as true today as it was 90 years ago.

In Africa, credit was the major limitation of modern agricultural practice given the fact that modern farming was only practiced by colonialists. Local farmers in South Africa, for example started modern farming practice after their independence when they had opportunities to access agricultural credit (Demirgu, Kunt, and Maskimovic, 2012). Historically, access to credit facilities has been identified as the direct solution to increasing investment in agriculture in Africa. Credit is a crucial factor in agricultural production and in many cases may be a limiting factor in small holder agriculture. According to Miller (2013), credit provides the means for the temporary transfer of assets from an individual or organization to one which has not. Credit may be described as a facility extended from the lender to the borrower and is repayable at maturity, which may range from a few days to several years. For a credit transaction to be completed, the

borrower must provide some evidence of debt obligation in return for the loan where the loan is based solely on good reputation, financial position of the borrower and trust. Despite the implementation of the various agricultural policies in Africa targeting to increase agricultural investment, what is discovered is the dwindling fortunes of the African countries in agricultural production. It is in the light of this that this study will examine the extent of agricultural credit in Nigeria.

In the formal setting of Nigeria, commercial banks and other specialized agencies are charged with the responsibility of providing credit to farmers. Nigerian Agricultural, Cooperative and Rural Development Bank (NACRDB) are typical examples of a specialized bank established for the purpose of advancing agricultural credit (Olowa, 2011). Through this bank, agricultural lending rates are regulated by government and at times subsidized. In addition to NACRDB, Agricultural Credit Guarantee Scheme (ACGS) was introduced to encourage the trading banks to increase their supply of agricultural credit through the provision of suitable loan guarantee. In 2005, Obasanjo's administration provided 50 billion naira agricultural loans to farmers in which the State governments were made to contribute counterpart funds for citizens of their State to participate. The government has also involved a number of institutions in the provisions of agricultural credit such as Agricultural Development Projects (ADPs), the river Basin Development Authorities (RBDAs), and National Directorate of Employment (NDE) (Idachaba, 2013).

As a result of the poor financial situation of small farmers especially in terms of low income and low savings, both national and international organizations have embarked on various programmes to boost the supply of agricultural credit in several States in Nigeria (Ijere, 2015). Agricultural growth in Nigeria is increasingly recognized to be central to sustainable economic development. The sector plays a very significant role in addressing food security, poverty alleviation and human development challenges. However, in more recent years, there has been a marked deterioration in the productivity of Nigeria's agriculture (Amaza and Maurice, 2015). Many reasons have been advanced for the declining agricultural productivity in Nigeria. One of the factors attributed to the declining productivity of the sector is farmers' limited access to credit facilities (Nwaru, et al., 2015). According to Alfred (2015), acquisition and utilization

of credit for agricultural purposes promotes productivity and consequently improves food security status of a community. Increase in productivity depends on adoption and technical efficiency of improved farming technologies (Obwona, 2014). In an effort to increase adoption rate among farmers, their purchasing power to acquire modern agricultural technologies should be improved. This is because most of the Nigerian farmers are smallholders trapped in vicious cycle of poverty. Obwona (2014) argues that when agricultural credits are made accessible to farmers it will go a long way in breaking this cycle of poverty and liberating the farmers to improve their production by adopting modern farming technologies which could enhance productivity and farmers' income.

1.1.2 Theoretical Perspective

This study was guided by loanable funds theory by McConnell and Brue (2005). According to the loanable funds theory, the rate of interest is the price that equates the demand for and supply of loanable funds. Thus, fluctuations in the rate of interest arise from variations either in the demand for loans or in the supply of loans or credit funds available for lending. This implies that interest is the price that equates the demand for loanable funds with the supply of loanable funds. Loanable funds are "the sums of money supplied and demanded at any time in the money market. "Supplied and demanded at any time in the money market."

1.1.3 Conceptual Perspective

Carter (2012) defined credit as obtaining control over the use of money at the present time in exchange for a promise to repay it at some future time. According to Sriram (2007), credit is a device for facilitating the temporary transfer of purchasing power from those who have surpluses of it to those who are in need of it. Nosiru (2010) defined agricultural credit as the amount of investment funds made available for agricultural production from resources outside the farm sector. According to Abbas (2003) agricultural credit is any of several credit vehicles used to finance agricultural transactions, including loans, notes, bills of exchange and bankers acceptances. In this study agricultural credit was operationalized as the money farmers borrow from formal financial institutions (specifically commercial banks) intended to improve their agricultural production. This study measured agricultural credit using loans.

Farm productivity refers to the output produced by a given level of input(s) in the agricultural sector of a given economy (Fulginiti and Perrin, 2011). According to Olayide and Heady (2012) farm productivity is the ratio of the value of total farm outputs to the value of total inputs used in farm production. In this study, agricultural productivity was measured using output/ha.

1.1.4 Contextual Perspective

Agriculture in Nigeria is labour intensive; dominated by small scale farmers who constitute 85% of domestic agricultural output and transforms their available time into labour (Oluyoleet al., 2015). This labour is either consumed on farm work, sold for money, traded for goods and services, allocated to leisure or expended on some other alternative activities (Olayide and Atobatele, 2012). The amount of labour available for farm production depends on who is included in the labour force and how many hours they are able and willing to work as well as the amount of capital available to hire labour. Lack of labour limits the extent of work done in small holders' agriculture. It is a limiting factor of farm production in Bichi local government farming system. According to Olayide and Otobatele (2012), labour available for planting and weeding limits the amount of land a farmer can manage and the labour available for harvesting the crops limit the final output, that is, farm production. As a result, labour constitutes a major determinant of farm productivity in Bichi local government.

For instance, World Bank (2015) reported that labour productivity in Nigeria is low and average 1.2 percent between 2000 and 2014, lower than 1.7 and 2.2 percent recorded in Ghana and Cameroun, respectively. The low productivity of labour in Nigeria has been contributing to a fall in farm production in Nigeria by average of 0.2% every year since 2005 (Umaru and Yaqub, 2013). The National Bureau of Statistics (2014) attributed the low values in labour productivity in Nigeria to constraints facing economic activities such as power and transport infrastructure, access to finance, science and technological capabilities, quality of educational institutions, investment climate and favourable policy support to business. Apart from the aforementioned factors, labour productivity is also constrained by insufficient funding. Lack of sufficient funding of agricultural sector limits the cash available to hire labour for farm operations especially during the peak period. Farmers are poor and unable to access formal credit to enhance their liquidity position. This coupled with the mass exodus of labour to urban centres in search of white collar

jobs results in increase wage for hired farm labours in rural areas hence eventually affecting the final farm productivity.

1.2 Problem Statement

Farm production in Bichi local government has been fluctuating in the past 3 years. For example, in 2011/12 Bichi local government produced 406.2 metric tons of groundnuts but dropped in 2012/13 to 284.737 metric tons. In addition to that, maize production also dropped from 911 to 371 metric tons. Furthermore, the production of beans also dropped from 377 metric tons to 192.27 metric tons in 2011/12 and 2012/13 respectively (NBS, 2014). The Nigerian government efforts to revamp the above poor performance through establishing irrigation schemes in Bichi local government, through distributing modern seeds, and through agricultural mechanization, however, little has been achieved. The fluctuation in crop production in Bichi local government has been attributed to a number of factors among which, lack of enough farm land, fertilizers, lack of skills to use modern agricultural methods, and lack of finance to purchase farm equipments and high yielding crop chemicals (Umaru and Yaqub, 2013). According to NBS (2014), agriculture employees 89% of the population in Bichi local government; this therefore implies that with the fluctuating production in agriculture, majority of the people might lose their source of income and livelihood and might become a burden to the government. Despite the fact that government has over the years come up with measures of revamping agricultural sector by disbursing agricultural credit schemes to commercial banks such as Agricultural Credit Guarantee Scheme (ACGS), Nigerian Agricultural Cooperative and Rural Development Bank (NACRDB) e.t.c. so that farmers can access it, yet the productivity of the farmers over the years still remains low. This study therefore attempted to investigate the effect of agricultural credit on farm production in Bichi local government, Kano State, Nigeria.

1.3 Purpose of the Study

The major purpose of this was to investigate the impact of agricultural credit on farm productivity in Bichi local government, Kano State, Nigeria.

1.4 Research Objectives

- i. To determine the level of farm productivity in Bichi local government, Kano State, Nigeria.
- ii. To find out the common challenges faced by the local farmers in accessing agricultural credit from commercial banks in Bichi local government.
- iii. To assess the effect of agricultural credit on the level of farm productivity in Bichi local government, Kano State, Nigeria.

1.5 Research Questions

- i. What is the level of farm productivity in Bichi local government, Kano State, Nigeria?
- ii. What are the common challenges faced by the local farmers in accessing agricultural credit from commercial banks in Bichi local government?
- iii. What is the effect of credit on the level of farm productivity in Bichi local government, Kano State, Nigeria?

1.6 Hypothesis

There is no significant effect of agricultural credit on the level of farm productivity in Bichi local government, Kano State, Nigeria.

1.7 Scope of the Study

1.7.1 Geographical Scope

This study was carried out in Bichi local government. Bichi is a Local Government Area in Kano State, Nigeria. Its headquarters are in the town of Bichi on the A9 highway. It has an area of 612 km² and a population of 277,099 as per the 2006 census.

1.7.2 Theoretical Scope

This study was guided by loanable funds theory advanced by McConnell and Brue (2005). According to the loanable funds theory, the rate of interest is the price that equates the demand for and supply of loanable funds.

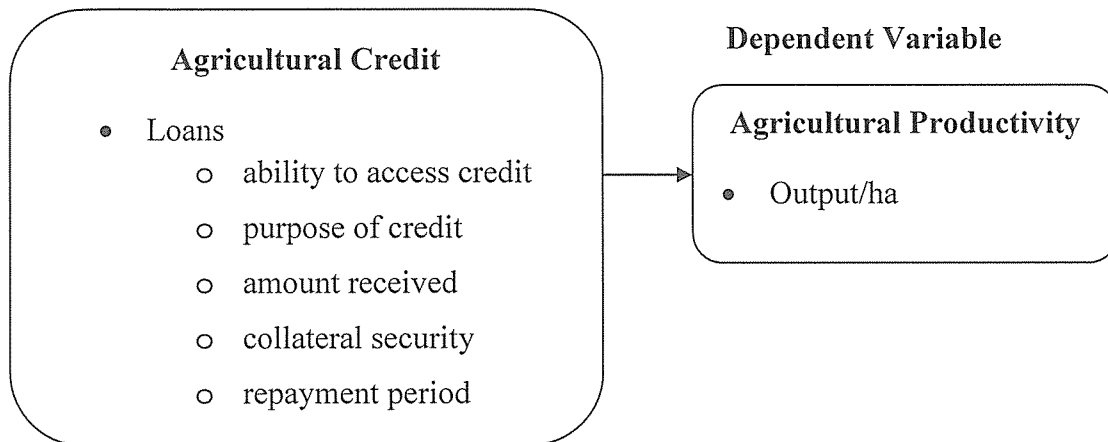
1.7.3 Content Scope

This study was limited to the level of farm productivity in Bichi local government, Kano State, Nigeria; the common challenges faced by the local farmers in accessing agricultural credit from

2.2 Conceptual Framework

Figure 1.1: Conceptual framework of the Study Showing the Effect of Agricultural Credit on Farm Productivity

Independent Variable



Source: Nwaigbo (2014); Anyanwuet al (2009) and modified by the researcher, 2016.

The independent variable (agricultural credit) was measured using access to loans, while the dependent variable (farm productivity) was measured using output/ha. The influence of the agricultural credit on farm productivity is that credit is received by the farmers and used to buy fertilizers, pesticides, land, irrigation, crop production chemicals, improved seeds et cetera, it can cause increase in the level of farm productivity. However, access to agricultural credit is often times limited by lack of collateral, lack of bank accounts, high interest rate, bank location, complex banking system, loan defaulting, or lack of credit information.

2.3 Review of Related Literature

2.3.1 Farm Productivity

Farm productivity refers to the output produced by a given level of input in the agricultural sector of a given economy, Fulginiti and Perrin (2013). Agriculturalists, agronomists, economists and geographers have interpreted it in different ways. Agricultural productivity is defined in agricultural, geography as well as in economics as “output per unit of input ” or “output per unit of land area”, and the improvement in agricultural productivity is generally considered to be the

results of a more efficient use of the factors of production, viz-a-viz physical, socioeconomic, institutional and technological (Dharmasiri, 2012).

According to Lambe (2012), low agricultural productivity is attributed to the problem of manpower development in agricultural sector, parochialism in the aspect of training, lack of appraisal and demoralization of agricultural staff, proffering solution. Lambe (2012) argues that training should be made available to agricultural personnel. He also recommended for availability of funds to the staff, that the sector should harness its resources and opted that service conditions be made more favourable and competitive so as to attract the right type of personnel into the sector as to him, the low rate of Nigeria's agricultural production is due to lack of sufficiently trained personnel.

Singh and Dhillon (2012) suggested that the “*yield per unit*” should be considered to indicate farm productivity. Many scholars have criticized this suggestion pointing out that it considered only land as a factor of production, with no other factors of production. Therefore, other scholars have suggested that agricultural productivity should contain all the factors of production such as labor, farming experiences, fertilizers, availability and management of water and other biological factors. As they widely accept that the average return per unit does not represent the real picture, the use of marginal return per agricultural unit was suggested.

Farm productivity may be defined as the ratio of index of local agricultural output to the index of total input used in farm production (Shafi, 2014). It is, therefore, a measure of efficiency with which inputs are utilized in production, if other things being equal. Agricultural productivity here refers to the returns from arable land or cultivable land unit. Dewett and Singh (2013) defined agricultural efficiency as productivity expressing the varying relationship between agricultural produce and one of the major inputs, like land, labor or capital, while other complementary factors remaining the same. This expression reveals that the productivity is a physical component rather than a broad concept. Saxon observed that productivity is a physical relationship between output and the input which gives rise to that output (Saxon, 2011). Considering such different views, productivity of agriculture has been examined in this paper from different perspectives, such as productivity of land, labor and capital.

Productivity of land is a very important factor of agriculture because it is the most permanent and fixed factor among the three categories of input; land, labor and capital. Basically, land as a unit basis articulates yield of crop in terms of output to provide the foodstuff for the nation and secure employment opportunities for the rural community. Productivity of land may be raised by applying input packages consisting of improved seeds, fertilizers, agro-chemicals and labour intensive methods (Fladby, 2013). And also it could be raised by applying crop diversification/ multi cropping in a season on the same land as practiced by the farmers of Mahaweli system 'H' area (Dharmasiri, 2013) and by adopting year round mix-cropping system on the same land as done by vegetable farmers of Nuwaraeliya district (Dharmasiri, 2013). Another initiative that can have the effect of raising land productivity involves ruminants, such as cattle, sheep and goats. Although rangelands are being grazed to even exceeding the carrying capacity, there is a large unrealized potential for feeding agricultural residues to ruminants, which have a complex digestive system that enables them to convert roughage, which humans cannot digest into animal protein.

Productivity of labour is important as a determinant of the income of the population engaged in agriculture. In general, it may be expressed by the man hours or days of work needed to produce a unit of production. Shafi (2014) has mentioned that the labour productivity is measured by the total agricultural output per unit of labour. It relates to the single most important factor of production, is intuitively appealing and relatively easy to measure. On the other hand, labour productivity is a key determinant of living standards, measured as per capita income, and this perspective is of significant policy relevance. However, it only partially reflects the productivity of labour in terms of the personal capacities of workers or the intensity of their efforts (OECD, 2015). In agricultural geography, the labour productivity has two major important aspects. First, it profoundly affects national prosperity and secondly, it principally determines the standard of living of the agricultural population.

Capital, in terms of purchase of land, development of land, reclamation of land, drainage, irrigation purpose, livestock, feeds, seeds, agricultural implements, and machineries, crop production chemicals is being given priority as a factor for enhancing agricultural productivity. Jamison and Lau (2012) and Alderman *et al.* (2014) have examined the relationship between the

level of education and wage with the crop productivity. A study conducted by Fafchamps and Quisumbing (2013) has also identified how various facets of human capital affect the crop productivity in Pakistan. Spatial analysis of farm productivity is very important because it can highlight the structure and problems of production relations on which basis appropriate policies can be suggested by the policy framers. The concept of farm productivity has been extensively used to explain the spatial organization and pattern of agriculture. Productivity is generally considered from two directions; (a) productivity of land and (b) productivity of infrastructure engaged in agriculture (Fafchamps and Quisumbing, 2013). Productivity of land is closely linked with the productivity of infrastructure. So, attempts have been made to examine the spatial differences through the present approach.

Land is a permanent and fixed factor among other production factors such as labor and capital. Farm productivity of land is explained by production of crops in terms of output or yield per unit of land. The productivity of labour has also taken an important place in agricultural economics. It is basically an important determinant of the labor force engaged in agriculture. The productivity of labor is somewhat a controversial concept than land productivity (Shafi, 2014). Labor input versus agricultural output is an important parameter of determining productivity of labor. Total labor force, number of man hours scarified for farming and market value of labor are very important factors of labor productivity while considering monetary value added per man hour or man day. However, agricultural labor productivity may be enhanced through training, and increase of incentives or wages etc. Working capital may be utilized in the agricultural production process. It is generally utilized for the purchase of land, for land reclamation, drainage, irrigation process, livestock purchase, feeds, seeds, fertilizers, chemicals, agricultural implements and machinery (tangible goods) etc. Capital may be an important component for determining productivity of land, which further refers to enhancing efficiency of land. Efficiency refers to the properties and qualities of various inputs, the manner in which they are combined and utilized in production.

Increase of the tangible capital such as high yielding varieties, fertilizers, pesticides, herbicides, agricultural instruments and machinery etc., in a systematic manner would be able to enhance

agricultural productivity in any unit of land. But farmer has to identify the optimum level to maximize farm productivity. Farm productivity is a measure of farming efficiency.

Farm productivity is frequently associated with the attitude towards work, thrift, industriousness and aspirations for a high standard of living, etc, (Singh and Dhillon, 2012). Some communities are much more efficient in maintaining a higher level of farm productivity by their own inherited special characteristics. In general, agricultural productivity is influenced by several factors, the major ones being physical, socio-economic and technological. Earlier the role played by physical factors attracted much interest. Nowadays, the importance of natural factors has been depleted while the dynamic factors like technology and socio-economic factors have come forward. Yet, people have minimal control over the physical environment such as rain, duration and intensity of sunlight, soil quality and timing of water availability. There is, therefore, no single goal that can be set for all situations in terms of highest productivity. However, attempts are being made to control some of the physical factors by using technology. Increasing soil quality by adding chemical fertilizers, farming by irrigable water, controlling pests by chemicals and increasing production by high yielding varieties (HYV) are some of the achievements of the present generation. In developing countries, using poor farm technology still results in low land productivity. As a result, difference between farmers using advanced farm technology and those not using it has today acquired a social significance. Yet, the climax of farm productivity of farmers is far off in the developing countries while some developed nations have gone far ahead in this context.

Adekanye (2014) and Oluyole (2015) showed that farmers that owned parcels of land on which they farmed were more productive than non-landowning farming households. This was understandable since farmers that owned land on which they farm were ready to make huge investments on such land through the adoption of new technological packages which enhance productivity levels. Adekanye (2014) provided empirical evidence showing that women had a lower level of productivity than men because they had far less access to land and other productive inputs.

The effect of farm size on farm productivity is inconclusive. Lau and Yotopolus (2013) using the profit function equation found that small farms attained higher productivity levels than larger

farms in India. Sahidu (2013) adopted the Lau-Yotopolous model to sample India wheat farms and came up with a contrary conclusion showing large and small farms exhibiting equal levels of productivity. Khau and Maki (2010) using the Lau-Yotopoulous model in Pakistan observed, however, that large farms were more efficient than small farms. Using a normalized profit function and stochastic frontier function, Ajibefun et al (2011) showed that large farm size enhanced productivity among farmers in the dry savannah and humid forest agro-ecological zones of Nigeria.

Adeoti (2012) considered how irrigation can affect agricultural productivity. Using the Cobb-Douglas production function and stochastic frontier model, both studies observed that productivity was higher on irrigated farms when compared to non-irrigated farms in the humid forest and dry savannah agro-ecological zones of Nigeria.

Ajibefun et al (2011), Adebayo (2012), Amaza and Olayemi (2013) all assessed how labor affected farm productivity in the dry savannah and humid forest agro-ecological zones of Nigeria. Using analytical tools such as the Cobb-Douglas production function, the normalized profit function approach, and the stochastic frontier model, Amaza and Olayemi (2013), and Dittoh (2014), observed that the use of hired labor reduced productivity when not properly utilized.

Outside Nigeria, Mochebele and Winter-Nelson (2014) investigated the impact of labor migration on technical efficiency performance of farms in Lesotho. Using stochastic frontier production, the study found that households that sent migrant labor to South African mines were more efficient than households that did not, with a mean technical efficiency of 0.36 and 0.24 respectively. Similarly, Nkonya et al. (2015) observed that pre-harvest labor positively affected crop production in Uganda.

Access to fertilizer, agro-chemicals, and improved seeds/planting materials has been proven as an important driver of agricultural production and productivity among farmers in Sub-Saharan African. Using stochastic frontier model, Mbata (2011) and `observed that the use of fertilizer increased agricultural productivity of crop farming in the dry savannah and humid forest agro-ecological zones of Nigeria. Nkonya et al (2015) also alluded to the positive impact of fertilizer.

The use of herbicides according to Mbata (2011), Ogundele and Okoruwa (2012) had a positive correlation with technical efficiency or productivity of farmers. However, Tella (2013), using the Timmer and Kopp indices, revealed that the use of chemicals contributed to productivity negatively if not properly utilized.

The use of improved seeds/planting materials on agricultural productivity were also documented in studies of Adewuyi (2010), Idjesa (2012), Ogundele (2013), and Tella (2013) in the humid forest, moist savannah and dry savannah agro-ecological zones of Nigeria. Findings of Idjesa (2012), Ogundele (2013), and Ogundele and Okoruwa (2012) using the stochastic frontier model revealed that the use of improved seed had a positive impact on the technical efficiencies of crop farmers. This finding was consistent with Nkonya et al (2015), who also showed that purchased seeds had a positive impact on a farmer's productivity in Uganda. Tella (2013), however, showed that improved planting materials when not utilized in the recommended proportion could reduce a farmer's productivity. However, the positive contribution to efficiency of farmers having access to improved planting materials could be reversed if the costs were relatively high and out of the reach of farmers. Adewuyi (2010) using the linear programming and Tobit models observed that the high cost and inadequate supply of input (plant material inclusive) negatively affected productivity.

2.3.2 The Effect of Agricultural Credit on Farm Productivity

A study by Abbas et al (2013) found that there is significant and positive relationship between institutional credit and agricultural GDP. This was attributed to the fact that agricultural credit schemes were advancing the production capacity of farm through agricultural inputs e.g. technological change and technical efficiency. This shows that easy access to the loan scheme and crop insurance would overcome farmer's losses.

A study by Siddiqi et al, (2014) found that there was a significant relationship between agricultural credit and production. This was because the flow of credit to farmers had increased demand for inputs to increase crop production. The elasticity of amount of credit, Number of tractors, irrigation, use of chemical fertilizer and pesticides etc with respect to dependent variable agricultural income on per cultivated as well as per cropped acre basis indicated that credit

(agricultural credit) and tube wells impacted positively and significantly at 95 percent confidence level. Number of tractors and use of fertilizers also contributed positively but insignificantly. It was because of inappropriate use of fertilizer and tractors.

Ahmad et al, (2014) in their study found that a significant relationship between agricultural credit and farm production. This was because advancing in-kind credit in the form of fertilizer and seed to smallholder farmers in the Ethiopian villages enhance agricultural production in the area. They found that in kind input credit of fertilizer and seed increased crop output reasonably.

In a detailed study by Mohan (2015), a significant relationship between agricultural credit and farm production existed. This was because the overall growth of agriculture and the role of institutional credit encouraged farmers to access credit which they would later use for agricultural production purposes. Agreeing that the overall supply of credit to agriculture as a percentage of total disbursement of credit is going down, he argued that this should not be a cause for worry as the share of formal credit as a part of the agricultural GDP is growing. This establishes that while credit is increasing, it has not really made an impact on value of output figures which points out the limitations of credit.

In another study, Golait (2013) attempted to analyse the issues in agricultural credit in India. The analysis revealed that the credit delivery to the agriculture sector continues to be inadequate. It appeared that the banking system is still hesitant on various grounds to purvey credit to small and marginal farmers. It was suggested that concerted efforts were required to augment the flow of credit to agriculture, alongside exploring new innovations in product design and methods of delivery, through better use of technology and related processes. Facilitating credit through processors, input dealers, NGOs, etc., that were vertically integrated with the farmers, including through contract farming, for providing them critical inputs or processing their produce, could increase the credit flow to agriculture significantly.

Jehan and Mohsin (2014) in their study found that there is a significant impact of credit advanced by commercial banks on crop production. This they argued that crop production could increase if the credit is properly utilized e.g. purchasing of quality seeds and pesticides, advance machinery

and techniques etc. this also implies that increase in production capacity tends to rise in income of the small farmer that ultimately increases their living standard.

Bashir et al (2013) in their study found that agricultural credit has a relationship with crop production. The researchers argued that a strategic source of agricultural credit enhances the production capacity of wheat that ultimately leads to increase in the living standard of rural farming community. They also found that better utilization of agricultural credit by the farmers had positive impact on production while other factors (availability of water, energy, technology and labor force) were taken into account.

A study by Nosiru (2015) found that micro credits had a significant effect on agricultural productivity in Ogun State, Nigeria. The researcher argued that micro credit enabled farmers to buy the inputs they needed to increase their agricultural productivity. However, the sum of credit obtained by the farmers in the study area did not contribute positively to the level of output. This was as a result of non-judicious utilization, or distraction of credits obtained to other uses apart from the intended farm enterprises.

A study by Farzand and Amjad (2011) found that credit had significant impact on agricultural production; its proper utilization in purchasing of agricultural inputs (Seeds, pesticides, fertilizer etc) increase production capacity of crop which ultimately increases agricultural GDP. Credit is a support to poor farmers to adopt new technology so that they can enhance farm production capacity. They also empirically analyze that there is 1% increase in disbursement of agricultural credit for agricultural input (seeds, pesticides, fertilizer etc) increase 1.5% agricultural GDP.

Last but not least, credit has been empirically proven to influence productivity. A study by Akinseinde (2014), using data envelopment and the Tobit model showed that having access to credit facilities contributed positively to a household's production efficiency in the humid forest agro-ecological zone of Nigeria. Similarly, Obwona (2013), using the translog production function, showed that access to credit contributed positively towards the improvement of efficiency among tobacco farmers in Uganda.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter dealt with the practical procedures which were used in carrying out this study. It gives details of the research design adopted, population of study, sample size, sampling procedure, research instruments, data collection procedure, data analysis techniques, ethical consideration and limitations of the study.

3.1 Analytical Technique

Access to agricultural credit is assumed to have a very significant impact on farm productivity. This is because if the credit is used for its intended purpose, say, buy more land, buy pesticides or fertilizers, buy improved seeds, hire more labourers, buy farm tools or acquire modern farming methods, there is a guarantee of increase in farm production. Take for example, if a farmer accesses agricultural credit to buy more land, it would mean that his hectares will increase hence the likelihood of increasing productivity. Furthermore, the use of modern farming methods such as use of improved seeds ensures that crops are healthy and not susceptible to diseases hence increasing the yields. Similarly, hiring more laborers at an extra cost to work in the farm ensures that every farm detail is handled such as digging, weeding, irrigating, harvesting etc, this eventually guarantees increase in productivity/output.

3.2: Conceptual Framework

Agricultural credit was determined using loans borrowed from commercial banks by the local farmers, however, access to such loans is affected by lack of collateral, lack of bank accounts, high interest rate, bank location, complex banking system, loan defaulting, or lack of credit information. On the other hand, farm productivity was measured using output/ha, however, this output can only be determined by land, labor and capital as factors of production.

3.3 Model Specification

To investigate the impact of agricultural credit on farm productivity, the study used the Ordinary Linear Square (OLS).

$Q = f(\text{Credit, Sex, Age, Education, Land ownership, Years of farming, Export, hire labor, number of paid workers})$

Variable definition and measurement;

Q = productivity=output/ha,

Crd = credit; (1 if got credit; 0= otherwise),

Sex = gender of the farm owner; (1=male, 0=female),

Age = age of farm owner (0=below 20; 1=20-29; 2=30-39; 3=40-49; 4=above 50),

Educ = educational level of farm owners (0=not educated, 1=primary, 2=secondary, 3=higher institutions),

Land = land ownership (0=own land, 1=otherwise),

Yrs = No of years of farming experience (0=less than 5 yrs, 1=5-10 yrs; 2=more than 10 yrs).

Export = if owner exports the produce (1=Yes, 0=No),

NOL= whether owner hires labor (1=Yes, 0=No),

Lbr = No of paid workers.

3.4 Measurement of Variables

Agricultural productivity refers to the output produced by a given level of input(s) in the agricultural sector of a given economy Fulginiti and Perrin (2013). In this study, agriculture productivity was measured using output/ha.

Agricultural Credit is the amount of investment funds made available for agricultural production from sources such as commercial banks, microfinance institution, and government grants;

outside the farm sector Nosiru (2015). In this study, agricultural credit was measured using: access to credit.

3.5 Research Design

A cross-sectional survey design was used in this study using both quantitative and qualitative approaches. According to Amin (2005) a cross-sectional survey design is flexible in both quantitative and qualitative research. Quantitative approach was used to describe the statistics of the current situation and investigate the relationships between the study variables using information gained from the questionnaires through OLS, while qualitative approach was intended to establish the phenomenon regarding agricultural credit by getting their views through face to face interviews.

3.6 Research Population

According to Bichi Famers' Association (2015), there are a total of 100,500 farmers registered with the associations. The researcher used this as the target population of the study.

3.7 Sample Size

The sample size was determined using Krejcie and Morgan's (1970) table of determining sample size. According to Morgan's table, a target population of 100,500 participants is appropriate for a sample size of 384 respondents.

3.8 Sampling Procedures

The researcher used stratified random sampling to subdivide Bichi local government in to 12 strata. The researcher further selected 32 farmers from each of the divisions using simple random sampling to make a total of 384 farmers. This was intended to make sure each respondent has equal opportunity to participate in the study.

3.9 Research Instruments

3.9.1 Questionnaires

The researcher used closed questionnaires to collect primary data from the farmers regarding agricultural credit and farm productivity. The researcher preferred questionnaires because they are easy to collect data with, since it takes short period of time and covers a larger population compared to other data collection tools.

3.9.2 Interviews

The study used face to face interviews to collect data from the selected key interview informants. This involved a face to face interview with 10 farmers from each of the 12 (strata) divisions, making a total of 120 participants. The researcher preferred to use face to face interviews because people tend to share a lot more information when someone is asking the questions in person and because it is much easier to ask a follow-up question and get examples to support what people are saying.

3.10 Validity and Reliability of the Instruments

3.10.1 Validity

The validity in this study was ensured by interviewing the same informant on some occasions and making observations more than once and over time, by comparing the results obtained with other evidence and by keeping accurate and detailed field notes to note the variations in responses over the course of time.

3.10.2 Reliability

The study used test-retest approach to ensure the reliability of the instruments. This was done by distributing questionnaires to 6 participants on two different occasions, picking them from each stratum. The results were found to be consistent in each case and the instruments were considered to be reliable.

3.11 Data Collection Procedures

An introduction letter was obtained from the College of Higher Degrees and Research of Kampala International University after the approval of the validity and reliability of the research instruments. The researcher briefed the respondents about his intentions to carry out a study on their farm production. The researcher later distributed the questionnaires to the respondents and asked them to answer all the questions in the questionnaires.

3.12 Data Analysis

Quantitative data from the questionnaires were carefully compiled, sorted, edited, classified, coded and checked for accuracy and relevancy. The researcher used frequency and percentage tables to present results on quantitative data. Furthermore, the researcher also used a simple

Pearson correlation and regression analysis to establish the effect of agricultural credit on farm productivity.

For qualitative data, the researcher used both textural and structural descriptions. Textural descriptions are significant statements used to write what the participants experienced. Structural descriptions are the interpretation of the context or setting that influenced participants' experiences. For textural descriptions, the quotes of participants were given in italics. The structural descriptions as interpreted by the researcher were provided in plain text.

3.13 Ethical Considerations

The following strategies were adapted to ensure the moral justification of the investigation.

Authorization: This involved getting consent of the respondents.

Anonymity and Confidentiality: The names or identifications of the respondents were anonymous and information collected from them was treated with utmost confidentiality.

Integrity: The researcher acted honestly, fairly and respectfully to all other stakeholders that were involved in this study.

Ascriptions of authorships: The researcher accurately attributed to the sources of information in an effort to celebrate the works of past scholars or researchers. This ensured that no plagiarism occurred.

Scientific adjudication: The researcher worked according to generally acceptable norms of research.

3.14 Limitation of the Study

1. Some farmers wanted to be paid for them to participate in the study. However, the researcher mitigated this by convincing them that the work is for academic purposes only.
2. Some farmers refused to participate in the study because they claimed they were too busy and that the study would not put food on their tables.

3. Furthermore, the researcher was limited by extraneous variables such as honesty of the respondents in answering the questionnaires. However, the researcher convinced them that if they told the truth, the government would help improve their level of access to agricultural credit hence improving their productivity.
4. The study is also limited to time constraint and only applicable to Bichi local government Area of Kano state Nigeria.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS, INTERPRETATION AND DISCUSSION

4.0 Introduction

This chapter presents the analysis of the data gathered and interpretation thereof. It gives the demographic characteristics of respondents and variables used.

4.1 Response Rate

Distributed questionnaires	Retrieved questionnaires	Percentage (%)
384	359	93

The researcher distributed 384 questionnaires but retrieved 359 questionnaires, giving a response rate of 93%. Amin (2005) asserts that a response rate greater than 50% is valid for analysis. This study therefore used 359 retrieved questionnaires for final analysis.

4.2 Demographic Characteristics of the Respondents

This section determines the demographic characteristics of the respondents. To achieve it, questions were asked to capture these responses. Frequencies and percentage distribution tables were employed to summarize the demographic characteristics of the respondents.

Table 4.1: Gender of the Respondents

Gender	Frequency	Percent (%)
Male	196	54.6
Female	163	45.4
Total	359	100.0

Source: primary data, 2015

Table 4.1 revealed that majority, 54.6% of the respondents were male while 45.4% were female. This could be because it is the male who are dominantly having land for farming compared to their female counterparts.

Table 4.2: Age of the Respondents

Age	Frequency	Percent (%)
20-29 years	26	7.2
30-39 years	83	23.1
40-49 years	142	39.6
above 50 years	108	30.1
Total	359	100.0

Source: primary data, 2015

Table 4.2 revealed that 39.6% of the respondents were within the age group of 40-49 years, followed by 30.1% who were above 50 year while those within the age group of 30-39 years and 20-29 years were represented by 23.1% and 7.2% respectively. This implies that respondents who were within the age group of 40-49 years were dominants in the study. This could be because this age group is old enough to own land of their own.

Table 4.3: Education Level of the Respondents

Education level	Frequency	Percent (%)
None	30	8.4
Primary level	130	36.2
Secondary level	90	25.1
Post-secondary level	109	30.4
Total	359	100.0

Source: primary data, 2015

Table 4.3 revealed that 36.2% of the respondents were within the primary level, while 30.4% of the respondents had post-secondary level of education followed by 25.1% who had secondary level of education and only 8.4% were not educated. This implies that those who were educated up to primary level were dominant in the study and yet the educated famers could better utilize

the economic resources for their farming activities since they are more familiar and can manage with the problems of the agriculture in better ways as compared to illiterate farmers.

Table 4.4: Family Size

Family size	Frequency	Percent (%)
Less than 2 dependants	62	17.3
2-4 dependants	50	13.9
4-6 dependants	103	28.7
More than 6 dependants	144	40.1
Total	359	100.0

Source: primary data, 2015

Table 4.4 revealed that 40.1% of the respondents had a family size of more than 6 dependants, followed by 28.7% who had 4-6 dependants while those with less than 2 dependants and those with 2-4 dependants were represented by 17.3% and 13.9% respectively. It implies that the greater the family size, the greater the labour force participation of household's members in agricultural activities and as a result agricultural produce rises.

Table 4.5: Farming Experience

Farming experience	Frequency	Percent (%)
Less than 5 years	75	20.9
5-10 years	89	24.8
More than 10 years	195	54.3
Total	359	100.0

Source: primary data, 2015

Table 4.5 revealed that majority, 54.3% of the respondents had farming experience of more than 10 years, followed by 24.8% who had farming experience of 5-10 years and only 20.9% had

farming experience of less than 5 years. The dominance of respondents with farming experience of more than 10 years implies that most of the locals in Bichi local government are farmers.

Table 4.6: Land Ownership

Tenure Status	Frequency	Percent (%)
Owner-operator	227	63.2
Lease holder/share-tenant	132	36.8
Total	359	100.0

Source: primary data, 2015

Table 4.6 revealed that majority, 63.2% of the respondents were owners of the land they farm on while 36.8% were lease holders. This implies that most of these people own land which they either inherited or purchased.

Table 4.7: Farm Size

Farm Size	Frequency	Percent (%)
1-50 hectares	197	54.9
51-100 hectares	73	20.3
101-150 hectares	47	13.1
151-200 hectares	33	9.2
More than 200 hectares	9	2.5
Total	359	100.0

Source: primary data, 2015

Table 4.7 revealed that majority, 54.9% of the respondents had farm sizes within 1-50 hectares, followed by those with land within 51-100 hectares. Similarly, respondents with farm size within 101-150 years were represented by 13.1% while those with farm sizes within 151-200 hectares were represented by 9.2% and those with more than 200 hectares were represented by 2.5%. The fact that most of the respondents had farm sizes between 1-50 hectares implies that they produce

in small scale, only enough for family consumption and selling the remaining for buying basic needs for the family. The effect of farm size on farm productivity is inconclusive. Lau and Yotopolus (2007) using the profit function equation found that small farms attained higher productivity levels than larger farms in India. Sahidu (2009) adopted the Lau-Yotopolous model to sample India wheat farms and came up with a contrary conclusion showing large and small farms exhibiting equal levels of productivity. Khau and Maki (2010) using the Lau-Yotopoulous model in Pakistan observed, however, that large farms were more efficient than small farms. Using a normalized profit function and stochastic frontier function, Ajibefun et al (2011) showed that large farm size enhanced productivity among farmers in the dry savannah and humid forest agro-ecological zones of Nigeria.

4.3 The Level of Farm Productivity among Farmers in Bichi Local Government

Objective One: the first objective of this study was to determine the level of farm productivity in Bichi local government, Kano State, Nigeria. This section starts by presenting the commonest crops produced in Bichi local government. Table 4.7 gives the summary of the findings.

Table 4.8: The Commonest Crops Produced by Bichi Farmers

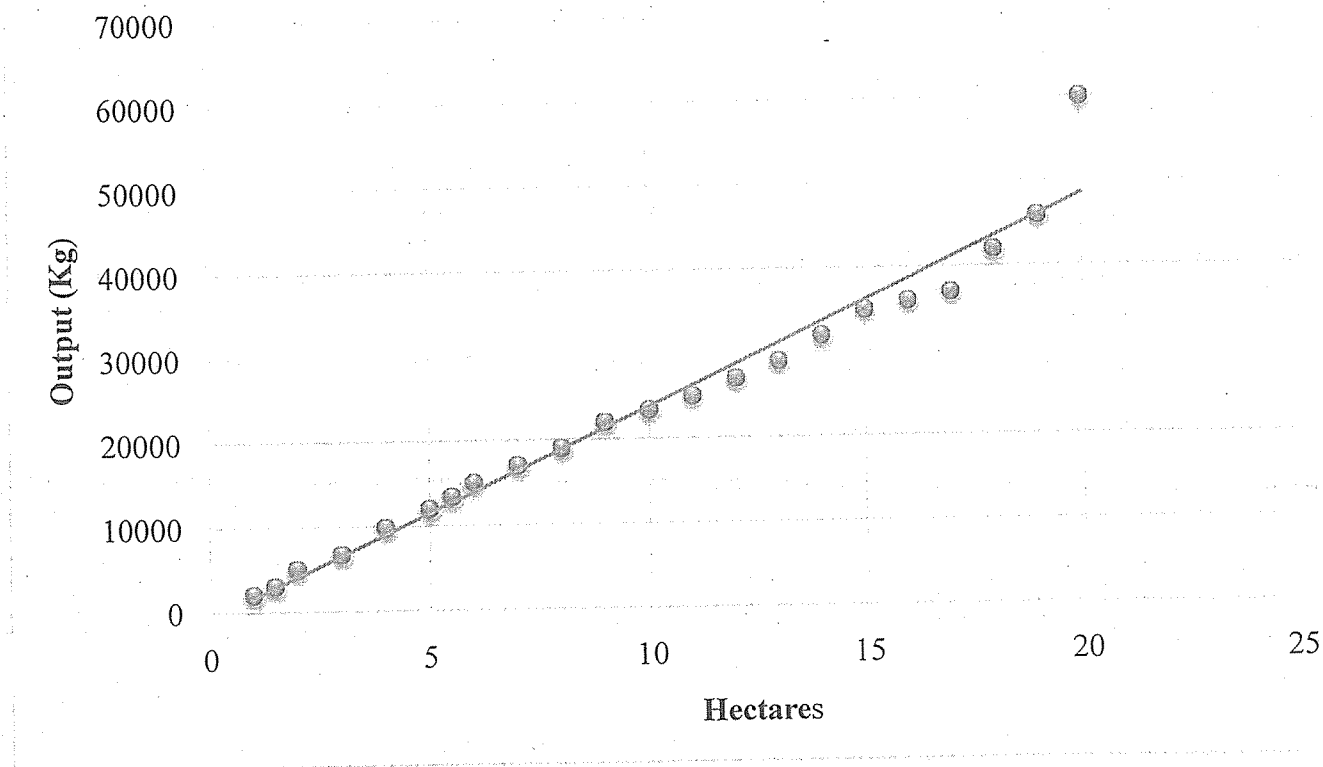
Crops	Frequency	Percent (%)
Maize	163	45.4
Beans	104	29.0
Groundnuts	47	13.1
Cotton	28	7.8
Rice	17	4.7
Total	359	100.0

Source: primary data, 2015

Table 4.8 revealed that 45.4% of the respondents were maize growers, followed by 29% who grow beans, and 13.1% who grow groundnuts. The rest of the respondents grew cotton and rice and were represented by 7.8% and 4.7% respectively.

The next section shows how crop output is affected by hectares. The researcher analyzed data from 359 questionnaires that were returned. Most of the smallholder farmers grew their crops in small hectares ranging from 1-20 ha and the outputs of these hectares were common among the

359 farmers. The researcher therefore decided to calculate average output against average hectare. The results were presented in a graph. Figure 1 gives the summary of the findings.



Source: primary data, 2015

Figure 1: Showing Crop Output Against Hectares

The results presented in figure 1 shows that there is a high level of farm productivity, that is up to 60,000kg of cereals can be produced in a space of only 20 hectares. This is because output increases with input, which in this study is hectare (land). This implies that farmers with high output are most likely to have big number of hectares while farmers with small hectares are likely to have small output. According to results in figure 1, high agricultural productivity is realized when a farmer grows on large hectares. However, this is only true if other factors of production are constant. This study measured output, which is agricultural productivity against hectares which is measured in terms of land. However, when capital (agricultural credit) as a factor of production is considered, the scenario might change. This is because agricultural credit might help a farmer to buy more junk of land, use improved seeds, use fertilizers, use irrigation

methods in dry seasons, hire more farm workers or buy crop production chemicals which eventually will increase crop yield.

The proceeding section gives a clear picture of how agricultural credit affects farm productivity.

4.4 The Common Challenges Faced By the Local Farmers in Accessing Agricultural Credit from Commercial Banks in Bichi Local Government

Objective two: the second objective of this study was to find out the common challenges faced by the local farmers in accessing agricultural credit from commercial banks in Bichi local government. Table 4.9 gives the summary of the findings.

Table 4.9: The Common Challenges Faced by Local Farmers in Accessing Agricultural Credit from Commercial Banks in Bichi Local Government

Common Challenges in accessing credit	Frequency	Percent (%)
lack of collateral	91	25.3
high interest rate	84	23.4
complex bank system	63	17.5
late approval	47	13.1
loan defaulting	29	8.1
lack of credit information	21	5.8
bank location	16	4.5
lack of bank account	8	2.2
Total	359	100.0

Source: primary data, 2015

Table 4.9 shows that collateral (25.3%) is the most common challenge faced by local farmers when accessing agricultural credit from commercial banks, followed by high interest rate (23.4%), complex bank systems (17.5%) and late approval (13.1%).

The researcher also used face to face interviews from 100 key interview informants to capture their in-depth opinions regarding the challenges they face when trying to accessing agricultural loans from commercial banks. The farmers shared similar views and the researcher decided to summarize some of the sampled responses as indicated below:

“...they ask for a lot of documentation, such as where are you coming from, what do you do, how much do you earn, who will stand as a guarantor for you etc. the whole process can take two to three months before you can finally get the loan....”

“.....when you want a loan from those people, they can ask for collateral security such as land title, vehicle, house etc, which smallholder farmers like us do not have....,

“..... I did not have proper farm records, so they could not value my earnings. They almost refused to give me the loan but when I took them to my maize farm, they were convinced though they ended up giving me half of what I had applied for....”

“.....Bichi local government does not have commercial banks in rural areas so sometimes we have to travel long distances to banks that are located in town areas. The whole thing is quite tiring and discouraging. Most of my friends seem not interested in traveling such costly and long distance just to borrow a loan....”

“.....the loan interest rates are very high for smallholder farmers like us. The local commercial bank in my town area charges up to 25% interest, something I cannot afford!.....”

“.....the commercial bank in my home area does not educate farmers on what the loan is all about. They only tell you that agricultural loans are available for borrowing. However, after receiving the loan, they give very many terms and conditions such as when you should return the money, which sometimes is too short for us farmers... ..”

“.....the loan amount given by these commercial banks is very small and is not enough to buy expensive agricultural inputs. Most of us farmers here we just depend on small loans to buy fertilizers, pesticides and improved seeds.....”

“...these loans are available but most of the farmers do not know about it. In fact me I got to know about it from a friend of mine who has a relative working in Abuja town; we indeed lack knowledge about these loans. The banks concerned should come up to the grass root level to educate the local farmers of their loan services.....”

The above results show that loans are difficult to be accessed by the local farmers and therefore it is necessitated for the commercial banks and the federal governments of Nigeria to make these loans easily accessible to farmers at affordable rates since the borrowers are poor and most of them lack collateral.

4.5 The Effect of Agricultural Credit on the Level of Farm Productivity in Bichi Local Government, Kano State, Nigeria

Objective three: the third objective was to assess the effect of agricultural credit on the level of farm productivity in Bichi local government, Kano State, Nigeria. The results were summarized in table 4.10.

Table 4.10: The Effect of Loan Purpose on the Level of Farm Productivity in Bichi Local Government, Kano State, Nigeria

					Loan purpose Vs farm productivity				
Pearson Correlation					.668**				
Sig. (2-tailed)					.005				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.668 ^a	.446	.406	.45233	.446	11.272	1	8	.005

a. Predictors: (Constant), farm productivity

Table 4.10 shows a positive and significant effect of loan purpose on farm productivity ($r=0.668^{**}$, $p<0.05$). Furthermore, loan purpose causes up to 40.6% variance in the level of farm productivity (Adjusted R Square=0.406).

Table 4.11: The Purpose of Loan Borrowed

What was the purpose of the agricultural credit?	Frequency	Percent (%)
buy improved seeds	101	28.1
buy fertilizers	97	27.0
buy agro-chemicals	53	14.8
buy and install irrigation equipment	49	13.6
buy land	19	5.3
buy livestock and feeds	15	4.2
buy agric implements and machinery	13	3.6
hire laborers	12	3.3
Total	359	100.0

Source: primary data, 2015

The results presented in table 4.11 revealed that 28.1% of the respondents borrow agricultural loans for purposes of buying improved seeds, 27% use it for buying fertilizers, while 14.8% use the loan for agro chemicals and 13.6% use it for buying and installing irrigation equipments. This therefore implies that when the loans are used for their intended purposes as indicated above, there can be guarantee of increase in farm productivity. This is because using improved seeds shows that the crops will not be vulnerable to diseases hence there will be a high likelihood of getting high yields. Furthermore, using fertilizers can improve the soil composition and nutrients which is right for the high yield of the crops. Similarly, the use of agro-chemicals can help the farmer to spray his crops hence they will not be able to be susceptible to pests and diseases that might destroy the crops. In addition to that, using the loan for irrigation also helps the farmer to grow crops throughout the season without being affected by erratic weather changes hence promoting continuous productivity throughout the year.

Table 4.12: Amount of Loan Borrowed

How much did you apply for?	Frequency	Percent (%)
150,000-200,000 naira	120	33.4
Less than 100,000 naira	91	25.3
100,000-150,000 naira	84	23.4
More than 1,000,000	64	17.8
Total	359	100.0

Source: primary data, 2015

The results presented in table 4.12 revealed that 33.4% of the respondents borrowed between 150,000 to 200,000 naira, followed by 25.3% who borrowed less than 100,000 naira while those who borrowed between 100,000 to 150,000 naira and more than 1,000,000 naira were represented by 23.4% and 17.8% respectively. The results indicated above show that most farmers borrow a small amount of agricultural loan which they can use for buying improved seeds, fertilizers or agro-chemicals. However, they cannot afford to borrow huge loans like 1million naira to buy land or modern agricultural machinery. The farmers in Bichi local government are mostly small holder farmers who are poor and mostly grow for home consumption. However, large amount of loans if used for agricultural intended purposes could guarantee improvement in the level of farm productivity. This therefore implies that considering other factors of production constant, amount of loan promotes farm productivity. That is to say, the higher the loan amount, the higher the likelihood of increasing farm productivity, otherwise, the reverse is true.

The researcher also enquired from farmers (*100 in number*) using face to face interviews on how agricultural credit had improved their level of farm productivity. The responses were summarized as below:

“.... I have always had a problem with my production since the soil was never good, I used the money I borrowed to buy fertilizers and improved seeds, since then my production for groundnuts have been enormous and I have been reaping big. So far I have finished servicing the loan I borrowed last year.....”

“....yes, the money has been very helpful to me in improving my production. The money that I borrowed was for buying more land and farming tools since I have already 8 hectares of maize and I needed to find more workers for this kind of farm work....”

“.....these banks really helped us a lot. Their loans helped me to buy better farming tools for beans farm and hire more laborers in a farm of 15 hectares. I could not work on it alone with my family members; I needed more workers so I had to get a loan....”

To quantitatively understand the effects of agriculture credit on productivity, the researcher used a simple OLS regression. The quantitative data collected was from cross-sectional survey and the data analysis was done using SPSS 22.0. Table 4.13 gives the summary of the findings.

Table 4.13: Regression Results

Variable	Coefficient	P-Value
Constant	2.223**	0.021
Crd	0.04***	0.001
Sex	0.068**	0.023
Age	0.002	0.968
Educ	0.58	0.71
Land ownership	0.17***	0.001
Yrs of experience	0.12*	0.098
Export	0.341***	0.003
Farm size	0.144	0.62
Lbr	0.167***	0.008
Prob > F = 0.0027		
R-Square = 0.90417		

Source: primary data, 2015

NOTE: ***, **, * means significant at 1%, 5% and 10% respectively.

From the table above, we confirm that the model is fit since the p-value is 0.0027 which is less than 0.05. This implies that all variables comfortably fit in the model. Furthermore, the R-Square value is 0.90417 which implies that all explanatory variables account for 90.4 percent variation in output.

Linearly our model becomes:

$$Q = 2.233 + 0.04\text{Crd} + 0.068\text{Sex} + 0.02 \text{ Age} + 0.58\text{Educ} + 0.171\text{Land} + 0.120\text{Yrs} + 0.341\text{Export} + 0.144 \text{ farm size} + 0.167\text{Lbr}$$

Interpretation of Results

The results presented in Table 4.13 revealed that agricultural credit had a positive coefficient of 0.04 and is significant at 5 percent level. This implies that those who get agricultural credit will increase their output by 0.04 units compared to those who do not get access to agricultural credit keeping other factors constant. Access to agricultural credit can help a farmer to acquire so many agricultural inputs such as farm tools, land, and improved seed, hire more workers, use modern methods of farming, and use chemicals to spray the crops hence protecting them from pests and diseases. The ability to use the agricultural credit for agricultural purposes can help a farmer to improve on his or her output. For example, when a farmer buys improved seeds, he or she will be able to get better yields compared to those farmers who use local seeds. Not only that, improved seeds have the ability to weather resistance while others are both pest and disease resistant. The problem is that some improved seeds are too expensive for the local farmers, hence agricultural credit come in handy. It can therefore be conclusively argued that agricultural credit when used for its rightful purpose can increase productivity when other factors of production are constant. This therefore implies that the farmers of Bichi local government should strive to make sure that they take the advantage of agricultural credit whenever possible for them to realize high level of productivity in their farms.

Furthermore, Table 4.13 reveal that gender had a positive coefficient of 0.068 and a significant P-Value of 0.023 implying that keeping other factors constant; a male person increases output by 0.068 units compared to a female person. The result above implies that males are more competent in agricultural activities compared to their female counterparts. This is because the men can do the farming, do the harvest, look for the market and means of transportation and use good level of bargaining power which most women do not do. Traditionally, it is very difficult for a woman to do what men do in farming. For example, cutting down heavy logs when clearing the farm land, carrying heavy sacks of manure, chasing after wild animals which are destructive

to the crops, doing agricultural machinery repairs and maintenance, and supervising farm workers. Women can manage simple work such as weeding, winnowing, tilling land or harvesting. Agricultural activities need manual labor, which the men have. This therefore makes the men to have a high chance of being more productive in the agricultural activities than the women. This is the reason why in this study, there is a significant impact of the male on agricultural output. This therefore implies that, the more the male, the more productive they will be since they cause 0.068 (6.8%) of agricultural output.

Similarly, the study revealed that Land ownership has a significant effect with a P-value of 0.041 implying that owning land increases output by 0.171 units compared to not owning land other factors held constant. This is because people do not want to invest in activities such as irrigation, using fertilizers etc if the land does not belong to them. Land in Bichi is mostly inherited, however those who want to do farming and they cannot afford land often hire. The problem here is that hired land is expensive compared to the output that a farmer will reap out of the agricultural activity when he finally harvests the crop. This is the reason why farmers who use their land will not face such costs since the land belongs to them. Whatever losses they might incur as a result of poor weather (that is drought or heavy rains), pests and diseases, may not have a greater impact on their expenses compared to the farmer who hires land and must pay the owner whether he has made a bumper harvest or not. For example, in a season when there is a drop in the prices at the market, the farmer who hired land will suffer more compared to the one who owns his or her land. Similarly, one may hire land whose production might have been too low because of overuse hence affecting the final output. In order to increase the productivity of such land, a farmer might decide to use manure which also ends up being too costly to maintain hence affecting the final out. It is therefore true to suggest that land ownership guarantees increase in output unit because all the expenses that a farmer who hired land goes through, a farmer who owns his own land does not incur such costs or drawbacks in their farming. This therefore means that it is better for farmers who hire land to just buy the land so that they can be able to enjoy the benefits of land ownership which comes with increase in output unit.

The findings further show that ability to export significantly improves farm productivity. Export had a coefficient of 0.341 with P-Value of 0.003 Farmers that export their produce, their output

will increase by 0.341 units compared to those that do not export when other factors are held constant. This is so because, farmers who produce for export mostly use modern farming methods, farm in large chunks of land, use improved seeds, use irrigation technology during drought and have access to agricultural credit. The abilities mentioned above guarantees increase in the units of output for such a farmer. However, a subsistence farmer may only grow for consumption, since he or she farms on a small piece of land, and does not have access to improved seeds since he cannot afford. Often, such farmers cannot access agricultural credit since they are considered high 'risk' by commercial banks. This therefore implies that farmers who produce for export have higher competitive advantage compared to their subsistence counterparts. The fact that they produce for export implies that they also make use of value addition which eventually is too profitable when sold at the international market compared to the local subsistence farmers who grow crops for home consumption and sell the remains in the local markets. Therefore, producing for export helps farmers to improve their farming methods which will eventually provide an assured increase in output unit. It is only unfortunate that not many farmers in Bichi are export farmers. Majority are instead subsistence farmers due to poverty and lack capacity to acquire modern farming tools.

Furthermore, the study revealed that Labour had a positive and significant coefficient of 0.167 with a P-Value of 0.008 implying that hiring an extra unit of labour increases output by 0.167 units, other factors held constant. This implies that farmers who have the capacity to hire labor are well established farmers who can afford to pay labor on a daily, weekly or even monthly basis. Hiring labor in Bichi ranges from between 2,000 naira to 25,000 naira per day. This implies that it is very expensive for subsistence farmers. This is the reason why subsistence farmers use family members to till a small piece of land. Therefore, hiring labor implies that a farmer will clear a big piece of land and be able to produce high level of output intended for export.

In conclusion therefore, the following factors significantly influence agricultural output: credit, sex, landownership, export and labour. However, the use of agricultural credit and land ownership influenced the greatest units of output. This therefore implies that more emphasis by

farmers should be put on using credit and owning land in order to improve and increase their agricultural output units even further.

However, other variables like Age, Education, years of experience and farm size could not be interpreted because of their insignificance at above 10 percent level of significance.

CHAPTER FIVE

DISCUSSIONS, CONCLUSION, AND RECOMMENDATIONS

5.0 Introduction

This chapter discusses the major findings of the study, gives conclusion and recommendations thereof.

5.1 Discussions

5.1.1 The Level of Farm Productivity among Farmers in Bichi Local Government

The study revealed a high level of farm productivity among the local farmers in Bichi local government. However, the high yields were attributed to the size of land the farmer owned. The bigger the junk of land, the larger the hectares hence high likelihood of large harvests and the smaller the hectares, the small the harvest but on conditions that other factor of production are constant. Dharmasiri (2013) agrees that productivity of land is a very important factor of agriculture because it is the most permanent and fixed factor among the three categories of input; land, labor and capital. Basically, land as a unit basis articulates yield of crop in terms of output to provide the foodstuff for the nation and secure employment opportunities for the rural community. Fladby (2013) adds that productivity of land may be raised by applying input packages consisting of improved seeds, fertilizers, agro-chemicals and labour intensive methods.

5.1.2 The Common Challenges Faced By the Local Farmers in Accessing Agricultural Credit from Commercial Banks in Bichi Local Government

The study revealed that the most common challenges faced by the local farmers in Bichi included lack of collateral, high interest rates, complex bank systems and late approvals. Collateral could be a common challenge in Bichi local government because majority of the farmers are poor and only use subsistence method of farming that cannot make them able to be trusted by commercial banks since their yields are questionable. Secondly, commercial banks also charge very high interest rate that smallholder farmers whose farm productivity depends entirely on rains without any irrigation mechanisms hence cannot afford such loans; this is the sole reason most farmers shy away from such loans and resort to handouts from friends and

relatives. Thirdly, the bank system is viewed to be too complex for a local farmer whose education level is very limited. The commercial banks in most cases require paper work, signing, recording etc which scare away potential borrowers. After going through all these hurdles, the bank may take up to 3months before approving a small loan. This is not good for a farmer who depends on weather changes; by the time s/he receives such a loan, it would be too late.

This study agrees with that of Okojie et al (2010) who found that the lack of bank accounts, collateral, and information regarding the procedure for accessing credits from banks limited rural women's access to credit from formal institutions while Agnet (2014) opined that the complex mechanism of commercial banking was least understood by the small-scale farmers, and thus, limited their access. On the other hand, Philip *et al* (2014) stated that high interest rate and the short-term nature of loans with fixed repayment periods did not suit annual cropping, and thus constituted a hindrance to credit access.

5.1.3 The Effect of Agricultural Credit on the Level of Farm Productivity in Bichi Local Government, Kano State, Nigeria

The study established a great effect of agricultural credit on farm productivity. This is because the study found a positive and significant effect of loan purpose on farm productivity ($r=0.668^{**}$, $p<0.05$). This is because using agricultural credit for buying improved seeds, fertilizers, agro chemicals or farm irrigation contributes to high crop yields. A study by Mbata (2011) revealed that access to fertilizer, agro-chemicals, and improved seeds/planting materials has been proven as an important driver of agricultural production and productivity among farmers in Sub-Saharan African. Using stochastic frontier model, Mbata (2011) `observed that the use of fertilizer increased agricultural productivity of crop farming in the dry savannah and humid forest agro-ecological zones of Nigeria. Nkonya et al (2015) also alluded to the positive impact of fertilizer. The use of herbicides according to Mbata (2011), Ogundele and Okoruwa (2012) had a positive effect on productivity of farmers. However, Tella (2013), using the Timmer and Kopp indices, revealed that the use of chemicals contributed to productivity negatively if not properly utilized.

This study also agrees with that of Adeoti (2012) who considered how irrigation can affect agricultural productivity. Using the Cobb-Douglas production function and stochastic frontier

model, Adeoti (2012) observed that productivity was higher on irrigated farms when compared to non-irrigated farms in the humid forest and dry savannah agro-ecological zones of Nigeria.

Furthermore, this study revealed that the size of agricultural credit had a significant effect on farm productivity ($r=0.648$, $p<0.05$). This implies that the bigger the loan size, the high likelihood of using it for better farming mechanism hence increasing the crop yields. This study agrees with that of Nosiru (2015) who found that micro credits had a significant effect on agricultural productivity in Ogun State, Nigeria. The researcher argued that micro credit enabled farmers to buy the inputs they needed to increase their agricultural productivity. However, Nosiru (2010) stated that the sum of credit obtained by the farmers in the study area did not contribute positively to the level of output. This was as a result of non-judicious utilization, or distraction of credits obtained to other uses apart from the intended farm enterprises.

5.2 Conclusion

The study established that farm productivity was high in a small piece of land and increased with increase in the hectares of land. However, this is only true when other factors of production such as labor and capital are constant. In addition to that, there was a significant effect of agricultural credit on farm productivity hence rejecting the null hypothesis and upholding the alternate hypothesis. This was attributed to the fact that loan purpose and loan size contributed a significant effect on farm productivity. This is because using a right amount of loan for buying improved seeds, fertilizers, crop chemicals or irrigation contributed a great deal to the level of farm productivity. However, access to agricultural credit has often not being easy given the lack of collateral among farmers, high interest rate, complex bank system and late approval among others. This has often limited farmers to potentially be able to expand their production/productivity.

5.3 Recommendations

In view of the above findings, the following is recommended:

There is need to assess the potential/ability of commercial banks to provide credit in the absence of collateral security. This helps provide alternatives help serve the poorest of the poor.

There is need for commercial banks to be flexible and rate of interest should be less for small farmers than large farmers because small farmers hardly acknowledge their basic need.

Furthermore, efforts should be made to simplify the borrowing procedure in the terms of time-lag, acceptance of security, documentation and disbursement of loan.

In addition to that, commercial banks should provide credit facility on time, otherwise the delay in the completion procedure for taking loans will occur and the farmers will not get maximum profit regarding their plans.

Similarly, there is need for commercial banks to put more commitments in implementing vigorously the policy of granting loan by purpose so that those segments of the nation's agricultural produce that are targeted for improved productivity will be achieved.

5.4 Areas for further Studies

There is need for a comprehensive study on the same topic covering the whole of Kano State that will allow generalized conclusion of the results.

Future studies should also cover farmers' attitude and perception towards the use of agricultural credit for farm production in Kano State.

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- b) 5-10 years
- c) More than 10 years

6. Tenure Status

- a) Owner-operator
- b) Lease holder/share-tenant

7. What is your farm size? _____

8. Do you use hired labour?

- a) Yes
- b) No

9. If yes, how many workers do you pay? _____

10. How much do you averagely pay each worker for a day's labour? _____

Section II: Access to credit

1. Have you ever applied for agricultural credit from a financial institution?

- a) Yes
- b) No

2. If No, why did you not apply?

- a) Not interested
- b) Too high interest rate
- c) Did not have security/collateral

3. What was the purpose of the agricultural credit?

- a) Buy land
-

- b) Buy livestock
- c) Buy farm tools and implements
- d) Buy farm inputs such as seeds, fertilizer, pesticides
- e) Purchase inputs/working capital for non-farm enterprises
- f) Pay for building materials (To buy house)
- g) Buy consumption goods and services
- h) Pay for education expenses
- i) Pay for health expenses
- j) Others, please specify _____

3. How much did you apply for?

- a) Less than 100,000 naira
- b) 100,000 naira -150,000 naira
- c) 150,000 naira-200,000 naira
- d) More than 1,000,000 naira

4. What was required as the main security?

- a) None
- b) Land
- c) Livestock
- d) House
- e) Future harvests
- f) Vehicle
- g) Character
- h) Salary

5. How much were you given instead?

- a) Exactly what I applied for
- b) Less than what I applied
- c) I was not given anything

6. What was the repayment period?

- a) Less than 1 year
- b) 1-3 years
- c) > 3 years

7. Was the interest rate friendly?

- a) Yes
- b) No

Section III: Agricultural Productivity

i) First Season

#	Name of Crop	Area (Ha)	Output	Exported	Market price
Crop1					
Crop2					
Crop3					
Crop4					
Crop5					

ii) Second Season

#	Name of Crop	Area (Ha)	Output	Exported	Market price
Crop1					
Crop2					
Crop3					
Crop4					
Crop5					

THE END

APPENDIX IB: INTERVIEW GUIDE

1. Has your agricultural output increased ever since you started using agricultural credit?
2. If yes, what did you use the money for that made your level of production to suddenly to increase?
3. What challenges did you face while trying to access agricultural credit for your farm?
4. What government policies are in place to assist farmers with issues of agricultural credit in your area?
5. What challenges do you face as a farmer that produces for export purposes?
6. What is your final say in regard to access to agricultural credit in your area?

THE END

APPENDIX II: MORGAN TABLE

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

Note.—*N* is population size.
S is sample size.