Reducing Small Scale Farmers Poverty through Credit access in Kwara State Nigeria

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Abstract
This is a study of credit access by small scale farmers and its impact on poverty reduction in Kwara state. The study made use of survey research design and adapted the Cobb-Douglas production function which measured the productivity of small scale farmers using ordinary least square method. The study also measured profitability, Net farm income and poverty status of borrowers and non-borrowers. It was found that though credit users had higher productivity, profitability and Net farm income compared to non-credit users, the difference was insignificant. Also, it was found that the poverty level of the famers who had access to credit was lower than that of farmers who did not have access to credit. Hence, the study concludes that credit can guarantee poverty reduction and also assist to include small scale farmers in the growth process if it is made available in sufficient quantities. The study therefore recommends an increase in credit available to small scale farmers through collaborative efforts between formal financial institutions and government since credit can positively impact on poverty reduction.
Keywords: Credit, Small Scale Farmers, Poverty reduction.
Gel Classification: Q14

INTRODUCTION

The concepts of farm credit and agricultural finance can be used interchangeably. The word "credit" comes from the Latin word *"Credo"* which means "I believe". Hence credit is based upon belief, confidence, trust and faith, it is otherwise called loan. Murray et al (1960) defined agricultural finance as "an economic study of borrowing funds by farmers, the organization and operation of farm lending agencies and society's interest in credit for agriculture. Credit is a certain amount of money provided for certain purposes on certain conditions with some interest, which can be repaid sooner (or) later. According to Galbraith (2007) credit is the "temporal transfer of assets from one who has to other(s) who have not" or a process whereby control over the use of money is obtained in exchange for promise to pay in the future. Agricultural credit has been variously defined by authors. According to Nwaru (2004):

> *Agricultural credit is the present and temporal transfer of purchasing power from a person who owns it to a person who wants it, allowing the later the opportunity to command another person's capital for agricultural purposes but with confidence in his willingness and ability to repay at a specified future date. It is the monetization of promises and exchanging of cash in the present for a promise to repay in future with or without interest. Without the willingness and ability to repay, the promise to repay at a future date would be futile.*

Credit is an important factor which increases the production and income of the farmers. In the rural areas of Pakistan, the small and marginalized farmers in order to meet their routine expenses readily depend on two sources of credit such as institutional and non-institutional. The non-institutional sources consists of money lenders, fellow farmers, commission agents, relatives and friends but the amount of borrowing is inadequate through these non-institutional sources (Khalid, Bashir and Mehmood, 2010; Hussain, 2012). Kamusaala, (2016) asserts that Low productivity characterize the rural poor, thus more focus is needed on other interventions that may better promote productivity/growth and poverty reduction, such as increasing social capital among communities of the poor. Strong interpersonal ties as in villages or organized groups of poor people build supportive communities with shared assistance.

Credit is an important factor which increases the production and income of the farmers (Khalid, Bashir and Mehmood, 2010; Hussain, 2012). In rural areas of Pakistan, the small and marginalized farmers in order to meet the routine expenses readily depend on two sources of credit such as institutional and non-institutional. The non-institutional source which contains money lenders, fellow farmers, commission agents, relatives and friends but the amount of borrowing is inadequate through these non-institutional sources.

In spite of over forty years of international aid in most developing countries poverty remains a persistent problem. It is one of the major causes of social, political and economic exclusiveness. The causes of poverty are complex and context-specific, but in general poverty tends to be linked with factors such as poor national economic performance, an unequal distribution of income and political structures that render poor people powerless (Cohen and Reaves, 1995). Poverty in Nigeria has been attributed to a lot of variables including neglect of agricultural sector, rapid population growth, corruption, poor educational system, high rate of unemployment, unequal distribution of income, collapse of business enterprises, failure of leadership regimes, political instability, terrorism, poor macroeconomic policies and environmental degradation (Ukpong and Ibrahim 2014).

It is also believed that the traditional system of agriculture is essentially a further reason for rural poverty in Nigeria, Most practitioners of agriculture especially the small scale farmers hardly have enough funds to carry out production activities due to inadequate access to credit. This scenario has made most farm families hardly have any savings to plough back into production, considering the pattern of their income and expenditure. Thus, the need arises for the provision of credit to the majority of Nigerian farmers.

The importance of credit to agricultural development cannot be over emphasized. Credit enables farmers to advantageously use inputs and factors of production, by granting farmers more access to resources through the removal of financial constraints. The traditional argument for the provision of agricultural credit is that additional capital can be temporarily used to enhance the level of household's productive and physical capital (Eswaram and Kotwal, 1990). The provision of credit will reduce the costs of capital intensive technology and assets relative to family labour. Thus, instead of growing low yielding local crops, for example, access to credit may allow an increased use of improved seeds and fertilizers leading to higher crop output per unit of labour and land (Feder, Just and Zilberman 1985). This may in turn encourage the adoption of labour-saving technologies, such as animal traction in crop production (Zeller, 1999). Carter (1989) argued that credit could lead to efficient resource allocation, increase farmers' technical efficiency and, by implication, increase farmers' profitability. Qureshi, Nabi and Faruquee (1992) observed that increase in credit to agriculture will lead to increase in food production and farmers' income because as the demand for credit increases, farmers output also increases, resulting in improvement in their well-being. Agricultural credit services are provided by both formal and informal institutions, although the informal credit services seem to be the most patronized especially in the rural sector. Consequent upon their poor resource endowment, most farmers are unable to meet the stipulated criteria for formal credit especially that of pledging collaterals for loans, which used to be a basic requirement for credit transactions. As a result, poor farmers were always left with inadequate capital for production purposes. This is one of the reasons behind the popularity of informal lending activities in Nigeria which are regarded as exploitative because they mostly charge higher interest rates, much to the disadvantage of the farmers.

According to National Bureau of Statistics (2012), Plateau state is one of the ten poorest states of Nigerian federation despite the fact that it is the 12th largest state in the country. Furthermore poverty is reported to be more severe in the rural areas than the city centre in the state. Furthermore, it is important to note that agricultural output in Plateau state, just like agricultural output at the national level and third world countries have been generally acknowledged to be low in literature (Ammani, Alamu, and Kudi, 2010). There has been a lot of discourse with respect to the low performance in agricultural output which is believed to be a major reason for rural poverty, while some scholars ascribed it to poor agricultural practices such as inadequate input use, fragmented land holding etc, (Seligson, 1982; Hayami and Ruttan, 1985) others attribute it to poor agricultural policies and inadequate farm credit. (Aku, 1991,)

The focus of this research is on formal credits. [1]The issue of institutional credit and performance of the agricultural sector has been highly contestable, with wide reaching and diverse opinions. Some authors look at the formal credit institutions to be risk averse and a bit sluggish in their credit advancement to risk prone sector like agriculture (Khandker and Faruqee, 2003), others have argued that the recipients have always shown high degree of credit delinquency, others look at the credit distributional bottleneck which at times result to untimely disbursement etc.

[2] It has been observed that Production of major food crops has witnessed a sustained decrease in Plateau state between the years 2004 and 2009, leading to a negative drift in production target over the period. For example, in the period 2004 to 2009, the shortfalls in production target were 1032.65MT, 873.95MT,

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[1] See also Palmer and Ojo, 1983 and Nwankwo, 1983
[2] See Agricultural Development Programme Document on National Reconciled Agricultural Production Survey (APS) (2010)

2436.13MT, 1166.12MT 1450.41MT and 1648.08MT respectively. This production shortfall is believed to be due to capital gap or inadequate credit available for farmers. (Agba, 2015). This observation is similar to the case in Kwara state, Nigeria. Although, agricultural production and hence poverty reduction is not only a function of increasing the stock of capital in the production process, it is believed that credit availability is useful in the acquisition of all necessary inputs in agricultural production process especially among the farmers given their low income base. So, adequate quantity and efficient application of credit is definitely important towards increase in output which can lead to poverty reduction among small scale farmers and food security in Plateau state in Particular and Nigeria at large.

This paper analyzes the impact of formal credit on productivity of rural small scale crop farmers in Kwara State, and estimates how it(credit) has helped in reducing poverty so that small scale farmers can become more economically, socially and politically inclusive in the development process. The international community's commitment to the reduction of poverty led to the declaration of Millennium Development Goals (MDGs) in year 2000 in order to cut poverty by half by 2015. Nigeria's commitment to achieving the MDGs was further boosted when in 2005 a new policy framework and guidelines for micro finance was launched. This shows the importance the Nigerian Government attaches to improving access to credit as an integral part of its effort to promote rapid economic growth, creation of jobs and especially reduction of poverty.

The growing awareness of the potential influence of credit in raising output and poverty reduction has effectively placed the issue of credit on the political agenda of the Nigerian nation. Accordingly, the Central Bank of Nigeria (CBN) which served as the regulatory body for formal financial institutions has effectively licensed existing microfinance banks in addition to existing commercial banks and the Bank of Agriculture (BOA) to provide micro credit related services with particular focus on the rural poor who are predominantly small scale farmers.

Efforts to make finance accessible to poor rural households are faced with several key constraints. First, rural incomes are highly susceptible to systemic risks, such as bad weather, disease and cyclical price fluctuation of agricultural commodities. Any loss of expected income has significant impact, and reduces savings and borrowing capacity. Returns on investment capital are low and profit margins are often very low. Operating cost are high especially in isolated areas and, since collateral is often unavailable, lenders face greater risk from loan default. The low level of skills reduces capacity for adopting new technologies, affecting both productivity and competeness in the market.

If these issues are credible, achieving financial sustainability by formal financial institutions might be difficult. And therefore, raising farm output through credit and improving the welfare of small scale farmers might be jeopardized. The relevance of this study is found in its attempt to investigate the implications of the pursuit of financial leverage through increased profitability of the formal financial institutions in their credit supply efforts to the rural economy and to assess the impact of the existing volume of credit supply in terms of output growth and increased welfare of small scale farmers in Kwara state, Nigeria. Surely if this is achieved it will help in actualizing the MDG goal of halving poverty by the year 2015 and significantly improving the welfare of small scale farmers in the state. In addition, this study hopes that the level of unemployment will be drastically reduced and food security will be enhanced in the state. This scenario will imply that more people will be included in the development process.

LITERATURE REVIEW
Conceptual Clarification

According to Igue (2005) poverty means the inability to afford certain predetermined consumption needs. This is commonly assessed using a comprehensive measure of real consumption or income including imputed values for consumption or income in kind, including income from own production (Ravallion, 2004). Poverty is not only a state of existence but also a process with many dimensions and complexities. It can be persistent (i.e chronic) or trancient. Trancient poverty, if acute, can trap succeeding generations. Attributes of poverty in Nigeria may be classified into structural, economic, social, cultural and political deprivations (Igue, 2005). Also according to Igue (2005), the structural dimension appears more permanent and manifests vicious cycle, reflecting limited productive resources, lack of skills for gainful employment, locational disadvantage and inadequate income to obtain basic necessities of life. The social dimension is largely a gender issue since the greatest weight of poverty is borne by women household heads and children from poor homes.

However the conventional notion depicts *poverty* as a condition in which people earn below a specific minimum income level and are unable to provide or satisfy the basic necessities of life needed for an acceptable standard of living whereas *inclusive growth* has been defined as output growth that is sustained over decades, it is broad based across economic sectors, creates productive employment opportunities for a great majority of the country's working age population and reduces poverty. It is about both the pace and pattern of economic growth.

However one defines it. There is no bigger policy challenge preoccupying political leaders around the world than expanding social participation in the process and benefits of economic growth and integration. A central

lesson of the recent financial crises is the need for a rebalancing of the emphasis placed by policy makers on drivers of what could be considered top line measure of national economic performance. GDP per capital growth on the one hand and the factors of its bottom line performance in broad based progress in living standards , on the other hand, in advanced and developing countries alike, it is increasingly recognized that GDP per capital is necessary but not sufficient condition for the satisfaction of societal expectations.

Theoretical Framework

This study examines the case of capital gap in agriculture especially among small scale farmers. It however believes that credit is a component of capital which is received by the farmer and used to boost productivity and hence reduce the capital gap. This work is therefore seen to be a capital based study and so the theories reviewed here are capital based theories.

Thomas Robert Malthus (1820) did not regard the process of economic development as automatic. Rather, it required consistent efforts on the part of the people. In his principles of political economy, Malthus was more realistic in his analysis of population growth in the context of economic development than in his 'Essay of population', according to him, population growth by itself is not sufficient to bring about economic development, rather it is the result of the development process. As Malthus wrote 'an increase of population cannot take place without a proportionate increase of wealth'. As the rate of capital accumulation increase the demand for labour also increases, population increases wealth only if it increases effective demand. And it is increase in effective demand that leads to increase in wealth. Of all the factors of production, it is the accumulation of capital that is the most important determinant of economic development and the source of capital accumulation is higher profits. Profits come from the savings of capitalist because workers are too poor to save. Malthus was one of the pioneers in the field of economic development who wrote about the poverty and underdevelopment of underdeveloped countries of his time in his "principles of political economy". He wrote on the economic backwardness of such countries like Spain, Portugal, Hungary, Turkey, Ireland together with nearly the whole of Asia and Africa and Latin American countries, hence his theory of economic development has more relevance to underdeveloped countries of today than the theories of other classical writers.

Malthus division of the economy into the agricultural sector and the industrial sector is highly realistic in the context of underdeveloped countries which have dualistic economies where agricultural sector lags behind the industrial sector. Despite technological progress the former sector is subject to the law of diminishing returns. The latter sector operates under the law of increasing returns. Consequently, the agricultural sector retards the progress of the industrial sector. Malthus analysis of the causes of poverty is highly realistic in the context of the present day underdeveloped countries. For him, poverty of peasantry is not due to the scarcity of fertile land, it is found because peasants do not have capital to make improvements on land. On the other hand, large landowners do not practice intensive cultivation due to the small size of the market. Since the bulk of the population subsists on labour intensive agriculture it is poor, therefore its demand for industrial output is low. The industrial sector remains limited in size and it fails to provide sufficient employment. Thus each sector acts as a drag on the growth of the other. Consequently, peasants, landlords, workers and industrialist have backward sloping supply curve of effort. The above analysis of Malthus appears like the condition prevailing in any backward country of Asia, Africa or Latin America.

The acceleration principle is concerned with the size of the desired or optimum stock of capital rather than the investment, this theory describes the technological relationship between the change in capital stock and the change in the level of output. The technological relationship between capital and output is defined by capital-output ratio; that is $\Delta k/\Delta y$. One of the assumptions of the acceleration principle that relates to this work is that all firms have a production function of a Cobb-Douglas type. This theory is related to this work because to increase the level of productivity of agricultural activities in general and crop production in particular, there is need to build up an optimum or desired stock of capital, it is in effort to build the desired stock of capital that credit becomes a useful tool in increasing production.

In almost all models of growth and development, capital accumulation is pivotal because it has the ability to raise the productive capacity of the sector in which it takes place. Capital accumulation depends on the rate of investment, which in turn depends on the rate of savings. Financial institutions play a dominant role in mobilizing savings and channeling those savings for investments as credit to productive economic activities. Therefore, the role of financial institutions is crucial in the development of any sector and agriculture is no exception to this.

Empirical Literature

The connection between agricultural credit and technical efficiency has been widely with different econometric estimation techniques depending on the underlying assumptions. Various researchers in different regions of the world including (Abate et al., 2014; Asante et al., 2014; Martey et al., 2015)

More recently, the productivity of agricultural credit in India was examined by Narayanan (2016), who

notes that credit was performing the twin roles of (1) preserving productivity through supporting mechanisation, and (2) contributing to the growth of AgGDP through the purchase of variable inputs. However, none of the above studies are based on the information provided by actual users of credit, and very little is known about the impact of formal institutional credit on returns to farming. In this context, this study aims to help understand the role of institutional farm credit on farm income and farm household consumption expenditures, with the help of a nationally representative agricultural household survey. Thus, the contribution of the present study lies in assessing the impact of formal, institutional credit on farm households' welfare (including net farm income and household consumption expenditures) based on a unique farm- and household-level dataset.

Several studies have been conducted in this area. For example, Iniodu and Ukpak (1996) conducted a study on the problem of limited financial resources for agricultural production, reconciling increased agricultural credit schemes and opportunities to rural farmers in post adjustment Nigeria. The study employed the use of variables like agricultural output, rural savings banks, local money lenders, social clubs, Age grade Unions and the conceptual framework was classical theory of demand and supply of credit. The assumption of perfect competition in the credit market where interest rate plays the allocative role and the methodology was comparative analysis using secondary information. The study concluded that linking formal financial sector to informal sector will enhance more access to financial resources by rural farmers. Also, increased credit schemes can only succeed with other programmes that will make available new opportunities to farmers.

Feder, Just, and Zilberman. (1985) estimated a switching regression Model for households in China and distinguished between farm households that are credit - constrained and those that are not credit constrained using a simple random technique of data collection, the method of analysis used was regression as well as other simple analytical tools like simple percentages, pie charts, bar charts, histogram etc. the study used variables like credit access, farm income, productivity, gender, farmers' experience etc. It was found that farm households with access to credits enjoy a higher standard of living due to higher farm output than those without access to credits.

Pitt and Khandker (1998) examined the impact of group based credit programs on the poor households in Bangladesh: Does the gender of participants matter? They used three programs: Grameen bank, BRAC, and RD-12 in Bangladesh on a variety of individual and household outcomes, including school enrolment, labour supply, asset holding, fertility and contraceptive use. They found credit to be a significant determinant of many household outcomes, and that credit program has a significant effect on the well- being of poor households in Bangladesh.

In a similar study conducted by Anchaun (1986) using the 1982 agricultural loans given to farmers in Funtua Local Government area of Kaduna state compared the productivity of loan users and non- loan users and used variables like farm output, credit and productivity. Furthermore, he made use of survey research method and his findings indicated that borrowers had larger hectarages and net farm incomes than non- borrowers.

Aku (1991) in her work titled "An Evaluation of the impact of institutional agricultural loans on farm resource use efficiency in Kaduna State". Used survey method of research and employed cross sectional data to achieve the objectives of study. Production function models were developed and linearized so as to apply OLS technique of regression. Descriptive tools were also employed to describe the effects of loans and other socio-economic effects on production output. It was found that borrowers had larger farms and incomes compared to non-borrowers who did not have access to credit. Furthermore, the study also found that the use of modern tools had escalated the cost of production of the farmers, the implication of this is that non-borrowers were located at a higher technological function than borrowers, it was concluded that unless credit amount was high enough to enable the borrowers bring their resource base to the level of the rich non-borrowers, the result obtained would be unclear, inconclusive and difference in the regression coefficients for the two groups of farmers would be inconsistent

Gap in Literature

From the literature reviewed, it is clear that so much work have been done in the area of impact of formal and informal financial institutions on agricultural output in other countries. A cross country survey shows that there is limited research work on credit impact studies with particular focus on crop production. Also, sources available indicates that no such study has been situated in Kwara State, and Kwara state being an agrarian state the researchers found it germane to update literature in this area.

METHODOLOGY

This study is situated in Kwara State which is one of the thirty - six states that make up the Federal Republic of Nigeria. Located in north western Nigeria, Kwara State occupies 36,825 square kilometres. In the 1976 state creation exercise, the Idah/Dekina portion of the state was excised to merge with a part of the then Benue-Plateau State to form Benue State. On August 27, 1991, five local government areas, namely Oyi, Yagba, Okene, Okehi and Kogi were also excised to form part of a new state called Kogi, while a sixth, Borgu Local Government Area, was merged with Niger State.
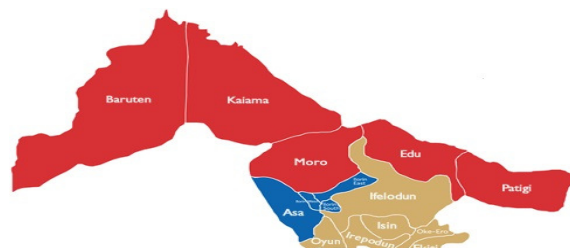
Fig. 1   Map of Kwara state Nigeria with local Governments Areas.

Kwara state is blessed with natural endowments in the areas of Agriculture, Tourism and Solid minerals. The state enjoys an invigorating weather which makes it most attractive to tourists. Also, its rich tourist potentials are intimidating when compared to other states of the federation. In the areas of solid minerals, the state is equally endowed tremendously, as it can boast of commercial and large scale availability of the following minerals; Gold, limestone, marble, feldspar, clay, kaolin, quartz and granite rocks. etc. In addition it produces a lot of agricultural products, excess of which are sold and transported to other parts of the country and for exports.

Despite the abundance of agricultural resources in Kwara state, the state experiences one of the highest levels of poverty, poverty is known to be highest among small scale rural farmers. These farmers even though form the majority of the population in the state, they are economically deprived, socially relegated and politically excluded and therefore do not contribute significantly to the development process of the state. The total number of local governments in Kwara state by senatorial districts include

Table. 1 16 Local Government areas by senatorial districts

Senatorial District	Local Government Areas					
Kwara north	Baruten	Edu	Patigi	Kaiamo	Moro	
Kwara Central	Asa	Ilorin East	Ilorin South	Ilorin west	Offa	
Kwara south	Ekiti	Oke-ero	Ifelodun	Irepodun	Isin	Oyun

Source: Compiled by Author (2017)

This study employs survey research design and used purposive sampling technique to obtain a representative sample from the population for which data was drawn from small scale farmers in Baruten, Patigi, Offa, Asa, Ekiti, and Irepodun local Government areas. The choice of these local governments was due to the fact that they are the major producers of maize in the state. To find out the impact of credit, the study used the counterfactual analysis whereby in the study area, The farmers were divided into two groups. Those that make use of formal credit (experimental group) and those that did not make use of formal credit (control group). At the end, comparison was made between the two groups using certain production and output parameters, so as to ascertain whether formal credit has made impact or not on poverty reduction. The procedure for data collection involves dividing farmers into borrowers and non- borrowers. Questionnaires were used to elicit data from 222 farmers who borrowed and 208 farmers who did not borrow totaling 430 respondents across the six local governments. Also, the formal financial institutions lending activities considered in this study include commercial banks, Microfinance banks and the Bank of Agriculture.

Conceptual Framework for Analysis

Agricultural output growth is the major feature of rural development poverty reduction. This is due to the fact that the major occupation of the rural populace is agriculture, if there is growth in the output of farmers, it is hoped that the welfare of the rural people will be enhanced. Output growth in agriculture is a function of several variables like, level of investment, availability of capital (credit), price level, savings rate, marketing etc. these variables are also determined by several other variables. Investment level which is a key determinant of output growth is known to be a function of savings rate, disposable income, volume of credit and inflationary rate. When these variables grow favourably, investment is also hypothesized to increase resulting to higher output. For any economy to grow, capital availability is known to be a prerequisite.

Credit availability in agriculture to be specific is synonymous to capital availability, and since farming has become capital intensive, small scale farmers need to be encouraged through access to credit so as to expand their farms ceteris paribus. These output increase is theoretically believed to bring about increased welfare, but the credit level to agriculture itself is determined by factors such as the behavior of financial institutions, government policy and implementation, inflation rate, interest rate, investment level and savings rate. These factors are themselves determined by other variables. Growth of agricultural output is also determined by price of agricultural products, if the price of agricultural output is reasonably high, agribusiness will be more attractive to willing investors who will want to take advantage of high prices to make more profit. One of the greatest problems in Nigeria is that, local farmers do not have the appropriate technology to compete with farmers in other parts of the world, due to inadequate capital, outdated technology, inadequate access to improved seedlings

etc. in addition to government policy towards importation of food substances, many consumers patronize foreign products thereby resulting to low demand for locally produced agricultural products. Price level is determined by demand level, supply level and total population.

Fig. 2

Analytical Framework
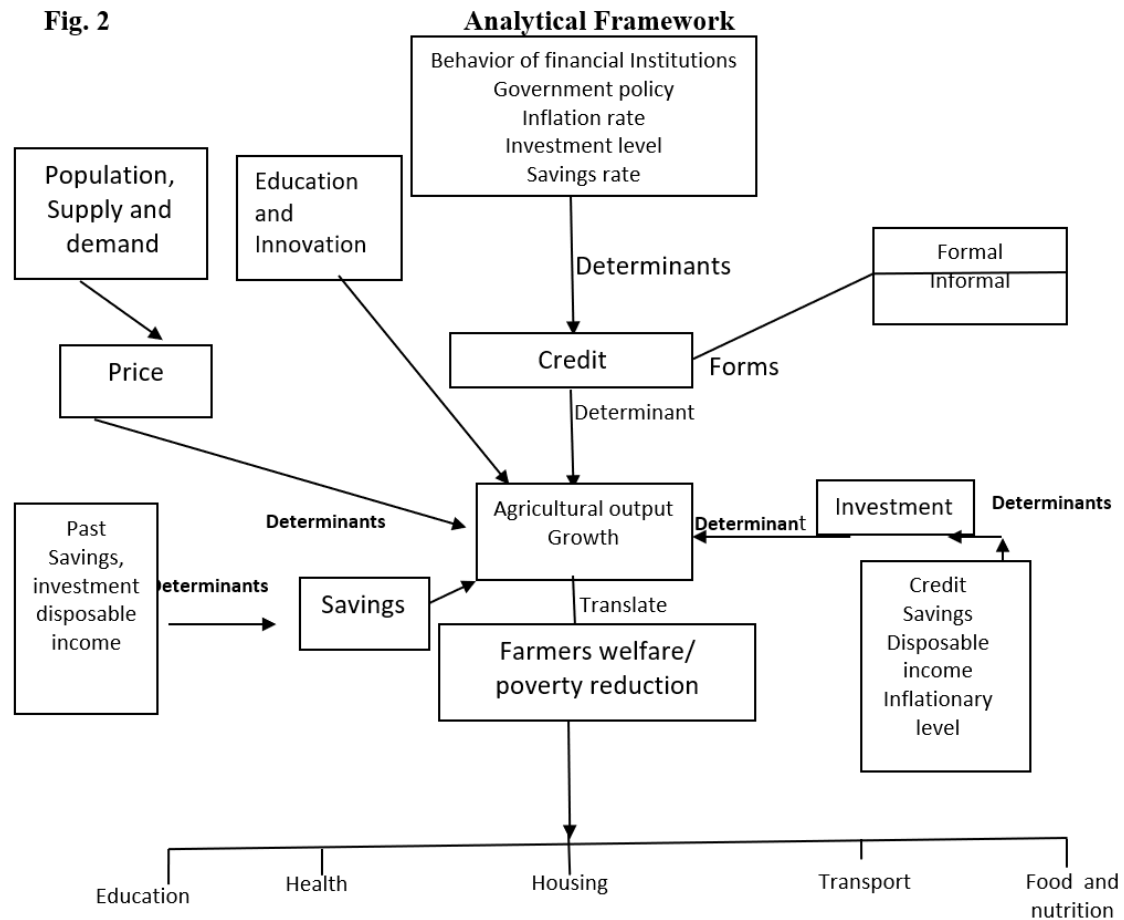
Source: Authors' Conception (2013)

There are several factors that determine the growth of agricultural output as shown in the framework above but our interest here is to explore how credit enters agricultural production function. Particularly, the study shows how various farm inputs can be increased either in quality or/and quantity so as to boost farm output as a result of credit. Past savings and other previously accumulated stock of farm resources shall be considered as capital for the farmer. The framework indicates that many of these variables have interrelationship with one another. That means that for agricultural output to grow, there are a set of variables that interact to produce increased output. However, our study looks at a constituent part of capital called formal institutional credit and its impact on farm output. The study believes that if output is increased, farmers welfare will also be enhanced, giving rise to better access to improved quality of education, health, housing, transport and food.

Sample Design

Purposive sampling technique was chosen because the size of the population that had the particular set of characteristics that the study elicited information from was very small. Therefore if some of the units were not included in the sample that was investigated, the researcher would have a significant piece of the puzzle not included. In this study, there were four major characteristics of interest; the respondent must be a crop farmer, a small scale farmer who cultivates not more than four hectares of land and must be involved in the cultivation of maize as a major crop and may or may not have borrowed from a commercial bank, microfinance bank, or Bank of Agriculture. Unfortunately farmers with all these characteristics are not widely distributed in the population. It is in this regard that the researcher decided to select respondents that possess these characteristics using the purposive sampling method.

Analytical Technique

Production functions provide measurement of useful economic tools such as marginal productivity of factors of production, factor intensity, efficiency of production and returns to scale. The purpose of production function is to determine relationship between variable inputs in production and output. The greater the extent to which the variable inputs explain the variability in output, the larger is the influence which the inputs have on output. For this study, the Cobb- Douglas production function was used and data were obtained from maize farmers and fitted into a double log function to test whether there were significant differences among farmers who borrowed and those who did not borrow. This analysis was used to obtain the parameters for the measurement of productivity.

The explicit form of the production function is specified as

$$Q = f(HL, FL, FERT, SD, CHEM, FS, CAP,) \ldots\ldots\ldots\ldots(1)$$

The production model in equation 1 was used to fit the variables of the two group of farmers i.e the experimental and the control groups for the purpose of comparison. It should be noted that the same production function above does not have a variable on credit. This is deliberate because credit may be accessed by the farmer but such credit only enters the production function through inputs or explanatory variables specified in the model above. In other words, credit is only used to procure factors of production which are mentioned as specified in the production function above. So specifying credit as one of the variables in the production model will mean including the magnitude of credit twice. See the definition of the variables specified in equation 1 above

Where Q is quantity of output of Maize produced by the two categories of farmers (in kilogram weight)

HL = Number of Hired Labour in days

FL = Number of Family Labour in days

FERT = Quantity of fertilizer used in Kg,

SD = Quantity of seeds in Kg,

CHEM = Chemicals used in litres,

FS = Farm Size in hectares,

CAP= Capital (in Naira). The input considered as capital here includes cutlasses, basins, hoes, etc. the econometric form of the model was expressed as below

Double log Function

The production function is given as

$$\text{Log } Q = \log a_0 + a_1 \log HL + a_2 \log FL + a_3 \log FERT + a_4 \log SD + a_5 \log CHEM + a_6 \log FS + a_7 \log CAP + \mu \ldots\ldots..(2)$$

Q, a_0, a_1, a_2, a_3, a_4, a_5, a_6, a_7, are parameters to be estimated and elasticity of response of the X_{ith} variable factors, HL,FL,FERT,SD,CHEM,FS, CAP and μ were defined as above $a_{0>0}$, $a_{1>0}$ $a_{2>0}$, $a_{3>0}$, $a_{4>0}$, $a_{5>0}$, $a_{6>0}$, $a_{7>0}$, and μ is random error term.

To test for difference and significance between beneficiaries and non-beneficiaries of formal credit three estimated regression functions were used to construct the F-ratio in order to test for significance and difference between the production function of the beneficiaries and the non beneficiaries. The pooled regression function (ie the function that pooled the beneficiaries and non beneficiaries) and the unrestricted residuals from the two unrestricted regression functions (that of beneficiaries and non beneficiaries), these statistics are used to construct the F-ratio and test at the 5% level of significance.

$$F = \frac{(RSS_R - RSS_{UR})/k}{RSS_{UR}/(n_1 + n_2 - 2k)} \qquad \ldots\ldots\ldots\ldots \quad (5)$$

Where:

RSS_R - restricted residual sum of squares

RSS_{UR} - unrestricted residual sum of squares

k   - the number of parameters estimated

n_1 - number of observations in the restricted data

n_2 - number of observations in the pooled data

Profitability Analysis

The gross margin analysis was also employed to determine the overall gross margin per hectare and the Net Farm Income (NFl) per hectare. The essence is to measure the profitability of the various crop enterprises. The Gross Margin and Net farm Income is estimated using equation 3 and 4 below.

$$GM = TVP-TVC \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.(3)$$

NFI   =   GM-TFC……………………………………………..(4)
TVP = Total value of production,
TVC = Total variable Cost.
NFI = Net Farm Income and.
TFC = Total fixed cost

Poverty Measure (Foster Greer and Thorbecke Index (FGT Indices))
Poverty line, head count index, poverty gap index and squared poverty gap index were computed to measure the incidence, depth and severity of income poverty, respectively. This was used to know the poverty status of the farmers. Poverty gap index was used to measure the depth of poverty in the study area considering the relevant welfare measure. Thus, one has to select a poverty line – that is a threshold below which a given household or individual was classified as poor. Poverty indicator is used for reporting for the population as a whole or for a population sub group only. Thus; the mathematical model developed by Foster, Greer and Thorbecke (1984); which is also called the P-alpha class of poverty measures was used because of the advantage of its decomposability. It was specified as:

$$P\alpha = \frac{1}{N} \sum_{i=1}^{q} \frac{(Z - Yi)^{\alpha}}{Z} \qquad - \quad - \quad - \quad - \quad - \quad - \qquad (6)$$

Where;
P = Poverty gap ratio or income gap ratio, which is the difference between the poverty line and mean income of the farmers
Z = poverty line
q = number of households below the poverty line
N = number of households in the reference population
Yi = expenditures of the households
α = Foster; Greer and Thorbecke (FGT) index (which takes the values 0;1;2)
This measure was used to ascertain if credit received has helped to alleviate poverty among borrowers. In using this model, consideration was given to differences in need due to different household size and composition. The household expenditure per adult equivalent was used as the welfare measure. There are different choices of adult equivalent scales used across countries. The most commonly used is that of the Organization for Economic Cooperation and Development [OECD] because of simplicity of its use and familiarity. This was being done with a view to ascertain if credit received has enhanced the farmers' welfare.
    A cut-off point of N307.00 was selected to serve as poverty line across the distribution of real household expenditure per adult equivalent. The poverty line was used to determine the magnitude, intensity and severity of poverty among the farmers.

Simple Head Count Ratio/Poverty Incidence
This gives the percentage of the people in the sample whose consumption per capita is less than the poverty line. In other words, it measures the number of poor as a percentage of the total population. The poverty aversion parameter equal zero. From equation (3.10), if α = 0 the poverty index becomes

$$P_o = \frac{q}{N} \qquad …………… \qquad (8)$$

This simple head count ratio has helped to show if credit has helped to reduce the number of poor farmers or it has worsen their situation.

Poverty Depth (Income Gap Ratio) - The Poverty Depth or income Gap Ratio/Expenditure Gap Ratio expresses the average short fall as a fraction of the poverty line itself. It was used to determine the percentage of income required to bring each individual below the poverty line up to the poverty line or above. A useful index is obtained when the head count ratio of poverty is multiplied by the income or expenditure gap ratio; or when the poverty aversion parameter is equal to one.

$$P\alpha = \frac{1}{N} \sum_{i=1}^{q} \frac{(Z - Yi)^{1}}{Z} \qquad …………………………………(9)$$

Poverty Severity - The mean of the squared proportion of poverty gap expressed below, attach greater weight to the poverty of poorest people than to those just below the poverty line.

$$p\,\alpha = \frac{1}{N} \sum_{i=1}^{q} \frac{(Z - Yi)^2}{Z}$$ …………………………………….(10)

The Head count and Gap index, implies uniform concern about the depth of poverty, but severity index allows for concern about the poorest of the poor. This has helped to see the different levels of improvement in individual farmers.

INTERPRETATION AND DISCUSSION OF RESULTS
Productivity Measure of Farmers Due to Credit Access in Kwara State

To analyze the response of output/productivity to formal credit, the Cobb- Douglas production function was used. The productivity analysis is carried out in the counter- factual for the purpose of netting out credit effect. In this case, three production functions are each estimated for Guinea corn farmers, one for beneficiaries, one for non-beneficiaries, and consequently a pooled function. The end result is to carry out Chow test by constructing the F-test so as to test the hypothesis that: there is significant difference between the estimated production function of beneficiaries and non-beneficiaries

Table 2. Productivity Regression Results

Variables	Pooled		Borrowers		Non borrowers	
	Coefficient	s.e	Coefficient	s.e	Coefficient	s.e
C	0.6326	(0.1303)	0.240	(3.890)	0.181	(2.039)
HL	-0.0180	(0.002)	-0.048	(0.108)	0.065	(0.137)
FL	-0.028	(0.0032)	0.029	(0.118)	-0.203	(0.135)
FERT	0.00098	(0.0005)	-0.318	(0.278)	0.329	(0.0205)
SD	-0.0207	(0.0004)	-0.006	(0.044)	0.013	(0.0205)
CHEM	-0.0330	(0.0134)	0.262	(0.487)	0.279	(0.055)
FS	0.0227	(0.0521) *	0.229	(0.464) *	0.241	(0.232)
CAP	1.1302	(0.7600)	1.073	(0.343)	0.001	(0.201)
DW	1.79		1.82		1.42	
Efficiency	2.065		1.271		1.106	
Returns to scale	0.429		1.28		0.755	
F- cal	13.1					
F-tab	1.96					

Source: Computation from Field Survey (2016)

Table 1 shows the estimated production functions for small scale farmers (i.e pooled, borrowers and non borrowers). From the results the values in parentheses are the standard errors, the estimated coefficients are partial elasticities. The sum of the partial elasticities would determine the total elasticity. The constant term is transformed to measure efficiency of production.

The borrowers regression results for farmers in the table above shows that the partial elasticity values for all the variables is less than one with some carrying negative sign which is contrary to our apriori expectation. Except (FS) farm size which is significant at 5% level of probability with an elasticity of 0.229, the rest of the variables have shown that the response of output to each of these variables is less responsive. For instance an increase of family labour(FL), hired labour(HL), fertilizer(FERT), seeds(SD), chemical(CHEM), farm size (FS) and capital(CAP) by 1 percent considering all other factors constant, led to an increase in output by 0.048, 0.029 0.318, 0.006, 0.262 0.229 and 1.073 respectively. The total elasticity was 1.28 meaning that the production function exhibit increasing returns to scale as well as an efficiency value of 1.271 meaning that farmers were efficient in their production method.

Table 1 also shows non borrowers regression results for small scale farmers. Here, the partial elasticities of all the values are less than one with some negatively signed as against our apriori expectation that all variables should be positively signed. The estimated function for borrowers in the table above indicates that all the variables in the production function were insignificant, for instance, an increase in Hired labour (HL), family labour (FL), fertilizer, seeds (SD), Chemical (CHEM), Farm size (FS) and capital (CAP) by 1 percent led to an increase of output by 0.065, 0.203, 0.329, 0.043, 0.279, 0.24 and 0.001 respectively. The total elasticity is 0.755 meaning that non- borrowers production function exhibits decreasing returns to scale and the variables that enter the production function are less responsive. This is believed to be so because of the poor capital base of this group of farmers. The efficiency parameter for borrowers (1.271) was higher than that of non borrowers (1.106), this result indicates that farmers who borrowed were more efficient than those who did not borrow, and this is believed to be as a result of credit received by borrowers

Testing for the difference between the production function of borrowers and non borrowers, the Chow test was adopted. The computed F-ratio from this test is 13.1 which is highly significant at the 5% probability level,

therefore the study rejects the null hypothesis that there is no significant difference between borrowers and non-borrowers. This difference is attributed to credit, as even the inspection of the individual productivity of factors shows that the variable of farm size is more significant in borrowers production function than non-borrowers.

Impact of Credit on Poverty Reduction in Kwara State

To analyze the response of poverty to formal credit, the study used Foster Greer and Thorbecke Index (FGT Indices). The FGT indices were used to investigate whether credit received has being able to reduce poverty among small scale farmers. The tool was used in the counter- factual for the purpose of netting out the effect of credit. In this case, the poverty status of farmers that borrowed, those that did not borrow and a pool of both borrowers and non-borrowers were estimated.

Table 3. Mean Poverty Estimate of the Respondents Compared

	Head count index	Poverty line (N)	Poverty gap index	Severity gap index	% of Household below poverty line
All farmers	0.178	307	0.2891	0.2112	72.0
Borrowers	0.168	307	0.2640	0.1911	70.2
Non-borrowers	0.179	307	0.2911	0.238	73.0

Source: Result Based on Data Analysis, 2017

The result of the household poverty status of the respondents surveyed is reported on table 4.17. In order to estimate the poverty index, a poverty line of 1 USD equivalent to N360 as at May 2017 was used. The results for all the farmers sampled in the table below shows that 72% of all the households studied were below poverty line while 70.2% and 73% of borrowers and non-borrowers were below poverty line respectively. This implies that most of the respondents in the study area are poor, but credit received by small scale farmers has had a positive but insignificant effect on small scale farmers. This result is plausible as poverty in Nigeria has been noted not to be only rural but agricultural based (World bank, 1990). Furthermore, the head count index gave credibility to the finding as 72%, 70.2%, and 73% for all sampled farmers, borrowers and non borrowers respectively of the sampled population were classified as poor. The poverty gap index was 0.28, 0.26, and 0.29 for all farmers, borrowers, and non-borrowers respectively and the severity gap index revealed that 21%, 19%, and 23% of all sampled farmers, borrowers, and non-borrowers respectively who were living below the poverty line were very poor.

The study expects that credit intervention in agriculture especially among small scale farmers should be able to solve the existing problem of poverty prevalence among the rural dwellers who are mostly practitioners of agriculture. It is rather unfortunate that the estimation of poverty status of the rural economy has shown that not much has been achieved in terms of poverty reduction. It is therefore necessary that policy makers, governments, private sector and other well spirited individuals should strategize on how farmers can be further supported so as to reduce the menace of poverty among farmers.

CONCLUSION AND RECOMMENDATIONS

This study has measured the productivities of various inputs in the production function of small scale farmers in Kwara state and found that, of all the inputs included in the production function of borrowers, only Farm size has a significant effect on output in the study area. Whereas no variable in the production function of small scale farmers who did not borrow tested significant to output within the study area. The marginal difference in productivity in favour of borrowers resulting to higher output is believed to be due to credit received by small scale farmers. This result is further supported by the finding that while the production function of borrowers exhibited increasing returns to scale, that of non- borrowers exhibited decreasing returns to scale. Also the study found that there is a significant difference between the production function of borrowers and that of non-borrowers. In line with the above findings, the study concludes that though credit received was useful in improving output, the degree of impact was insignificant in solving the poverty problem of the farmers and reasonably boosting the level and quality of their welfare.

The implication for the existing state of poverty in the study area despite credit availability is the inability of people to sufficiently participate in the political process. Also, most farmers could not access the available social amenities which make them more impoverished and therefore impossible to be included in the development process. The factors militating against small scale farmers have further worsened their economic circumstances due to their inability to take advantage of the available facilities.

In line with the above findings, it is recommended that unless there is increased volume of credit to small scale farmers, poverty reduction and welfare enhancement can hardly be achieved within the state given that majority of small scale farmers depend on the output of this staple crop to earn a living. Therefore, government and other forms of formal financial institutions must all join hands to ensure that these farmers are made to access adequate quantity of credit to overcome the problem of low production due to capital trap.

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