

ACCESS TO AND MANAGEMENT OF CREDIT BY RICE FARMERS AT THE KPONG IRRIGATION PROJECT.

BY

LILIAN MAWUSE AFUA KONU



**A THESIS PRESENTED TO THE COLLEGE OF AGRICULTURE AND CONSUMER
SCIENCES, UNIVERSITY OF GHANA, LEGON, IN PARTIAL FULFILLMENT OF
THE REQUIEREMENTS FOR THE AWARD OF A MASTER OF PHILOSOPHY
DEGREE IN HOME SCIENCE.**

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DECLARATION

I, do hereby declare that this work, with the exception of acknowledged quotations and ideas is entirely mine. I further affirm that this work has never been submitted to any other University in part or in whole for a Degree or Diploma.

.....

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ABSTRACT

The study was conducted in the Dangbe West District of the Greater Accra Region. The main objective of the study was to find out how rice farmers access and manage credit to improve their families standard of living. The specific objectives were to find out about available credit packages for rice farmers at the Kpong Irrigation Project, examine why rice farmers at Kpong Irrigation Project access credit, determine the benefits rice farmers may derive from using credit, evaluate the problems (if any) that rice farmers encounter with the use of credit and also access how rice farmers manage the credit taken. It was hypothesized that HO₁ There is no relationship between source of credit accessed and the use of credit. HO₂ There is no relationship between type of credit facility accessed and annual income. The snow ball sampling was used to select two hundred rice farmers for the study. Six key informants were also purposively selected. The respondents were interviewed using a structured interview guide. The data was analyzed using the Statistical Package for Social Sciences (SPSS) software to generate frequency and percentage distributions. The chi-square statistic was used to test the null hypotheses. The results revealed that majority of rice farmers were aware of two or more sources from which they could access credit. These sources include formal, semi-formal and informal sources. Respondents accessed loans to finance their farming activities in areas such as land preparation, purchasing farm inputs such as seed rice, agro chemicals as well as for harvesting and threshing. The results revealed that respondents derived benefits from the use of credit including purchasing inputs and use of machinery to ensure high yield, undertaking land preparation, attending to welfare needs of family members as well as marketing their produce from accessing credit. Challenges encountered include small loan sizes, delays in disbursements and high interest rates. The chi-square analyses revealed a significant difference between source of credit and use of credit so HO₁ was rejected. It was concluded that rice farmers had adequate knowledge about credit facilities and accessed credit from a variety of formal, semi-formal and informal sources to help in their farming activities. Farmers derived benefits from these loans in the short run. They faced certain challenges like late disbursement of loans. Due to training given to clients before and after disbursement of loan, rice farmers were able to use loans effectively for the intended purpose. It is recommended that credit providers repackage loans to make them more attractive,

and also intensify training programmes so that loans are used for the intended purposes and encourage more women to undertake rice farming so as to improve standard of living of families.



DEDICATION

To the memory of my late mother Madam Margaret Dugbazah, who laid the foundation, constantly inspired me, and was the best mother any daughter could wish for.

To my wonderful children Edem and Mawuenam Agbeko for their love and support.

To my husband Love Agbeko for everything.

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LIST OF ACRONYMS

ADRA	–	Adventist Development and Relief Agency
ADB	–	Agricultural Development Bank
ADF	–	African Development Foundation
AFDB	–	African Development Bank
ASCRA	–	Accumulating Savings and Credit Association
BADEA	–	Arab Bank for Economic Development
ERP	–	Economic Recovery Program
FBO	–	Farmer Based Organization
FAO	–	Food and Agricultural Organization
FASDEP	–	Food and Agriculture Sector Development Policy
FINSAP	–	Financial Sector Adjustment Project
GDP	–	Gross Domestic Product
GIDA	–	Ghana Irrigation Development Authority
GoG	–	Government of Ghana
GTZ	–	German Technical Cooperation
IRRI	–	International Rice Research Institute
ISSER	–	Institute of Statistics Social and Economic Research
IVS	–	Inland Valley Swamp
IYR	–	International Year of Rice
KIP	–	Kpong Irrigation Project

MF	–	Microfinance Institution
MOFA	–	Ministry of Food and Agriculture
NDPC	–	National Development Planning Commission
NGO	–	Non Governmental Organization
OECD	–	Organization for Economic Co-operation and Development
PMU	–	Project Management Unit
ROSCA	–	Rotating Savings and Credit Association
SHG	–	Self Help Group
SPSS	–	Statistical Package for Social Science
TAF	–	Technical Assistance Fund
UNDP	–	United Nations Development Programme
USA	–	United States of America
USAID	–	United States Agency for International Development
USD	–	United States Dollar
WARDA	–	West African Development Association

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This chapter deals with the introduction to the study. It gives a brief background to the study, statement of the problem, research questions, objectives of the study, significance of the study and definition of terms.

1.1 Background information

Agriculture is the bedrock of the Ghanaian economy and has contributed immensely to the growth of the Ghanaian economy since independence (ISSER, 2002). It employs sixty six percent (66%) of the labor force, accounts for over forty percent (40%) of the total gross domestic product (GDP) and about seventy percent (70%) of exports (World Bank, 2000; ISSER 2002; Statesman, 2006).

Rapid agricultural growth has been perceived as a key to achieving a country's developmental, social and economic goals (National Development Planning Commission, 1997; Poliquit, 2006). In spite of the agriculture sector's importance as well as potential, the rate of growth of the sector has been declining over the years (ISSER 1999, 2002; NDPC, 1997). This has been attributed to the fact that most farmers especially those in the rural areas (who form 65% of the Ghanaian population) are subsistence farmers, with small land sizes, who depend directly or indirectly on rain fed agriculture and related occupations for their livelihoods (World Bank, 1995; Ghana Statistical Service, 2002). Use of poor technologies, outmoded land acquisition, lack of technical know-how as well as continued reliance on rain fed agriculture has resulted in low crop yield and low standard of living (NDPC, 1997; ISSER, 1999 and 2002).

A vital area necessary for the modernization of Agriculture in Ghana is irrigation (Kyei Baffour & Ofori, 2002). Irrigation will ensure consistent food supply reduce poverty at household level, reduce the rural- urban migration, allow commercial production of food for the local market

forexport, allow for increased possibilities of crop diversification, and for the attainment of food security. Another crucial resource, needed in farming is access to funds. Most subsistence farmers have inadequate access to finance or capital so they seek credit from various sources including banks, individuals, susu collecting agencies and money lenders among others.

Credit is any form of deferred payment (Finlay, 2002). Agricultural credit or lending can be defined as giving out of credit (in cash and kind) to small scale farmers for the purpose of farming (Abbot & Makeham, 1979). It could also be described as the process of obtaining control over the use of money, goods and services in the present in exchange for promise to repay at a later day (Adegeye & Ditto, 1985). These agricultural loans are considered seasonal loans and payable after the crops have been harvested (MCPI & AIM, 2007). Credit is usually advanced for those items we require but cannot immediately afford. For instance, it is given for productive purposes, for consumption, housing or special occasions (Ledgerwood, 1999). Credit can be invested in a household's future prosperity by purchasing assets such as plant machinery and farm inputs such as fertilizer and bullock ploughs.

Credit is advanced because it helps improve the social relations that keep these farmers in a poverty situation. Credit also plays an important role in agricultural development. It is an important instrument used in poverty alleviation, livelihood diversification and increasing the business skills of small farmers (DBSA 2005; Poliquit 2006). Access to credit facilities increase incomes of farmers in the short run and enables farmers establish and expand their farms (Llanto, 1987; Yaron 1992; Okurat et al 2004). Provision of credit also encourages farmers to use modern technologies and procure inputs for farm use, thereby increasing their level of productivity and incomes. Credit can be used to invest in a household's future prosperity by purchasing assets such as plant machinery and inputs such as fertilizer and bullock ploughs. It helps improve the standard of living of the poor through increasing food production, raising incomes and therefore permitting increased saving. Access to credit also enables farmers acquire lands, inputs, both skilled and unskilled labor and also access good markets for their produce which would ultimately result in an improved standard of living.

Because of these benefits of using credit, there seems to be a strong demand especially for agricultural credit by farmers (Yaron et. al., 1997). A major constraint faced by farmers however is access to finance or credit. Access to finance or credit seems to be limited to few people and is particularly a problem for the small holder farmer and more so for women than for men (SPORE, 2000). This is because these small holder farmers (especially women), lack information and knowledge about existing credit facilities and requirements. They are also normally disqualified from formal loans due to high transaction costs, high interest rates and a lack of both collateral and capacity to pay (Yaron et al, 1987). As a result of this, projects go for group loans for its members as is the case at the Kpong Irrigation Project. Credit packages are accessed mainly from the banks or other lending organizations for the production of rice. These credit packages are designed as part of development interventions by government as well as nongovernmental organizations. The credit provided could be in the form of cash, inventory or supervised input credit. Such credit packages encourage expansion (e.g. increase in farm production and wealth) which invariably leads to greater prosperity and greater spending power (Makeham and Malcom, 1986; Robinson, 2001).

The management of credit is a factor which may determine the independence or otherwise of small farmers. Improper appraisal of loans, poorly prepared lending programs and management of credit, may all contribute to the loan not being utilized properly. It is likely that whilst credit may be seen by the lending agency as a productive resource, the small holder farmers may take credit for other purposes. When this happens, the returns from such investments may not be able to support the repayment of the loan. This could go a long way to affect the family finance. On the other hand if credit is utilized properly it can be a key to success, as well as independence from “shylock” moneylenders and help improve families’ standard of living.

1.2 Statement of the problem

Farming generally requires some form of financial investment and rice farming is no exception. Rice farming requires quite a substantial financial investment to cover operations from land preparation to harvesting and processing of the rice grains. Despite the provision of credit to farmers under the Kpong Irrigation Project, anecdotal evidence suggests only a minority

(600farmers) access credit from the Agricultural Development Bank (ADB). What is preventing other farmers from accessing credit? It has also been observed that farmers who accessed credit do not show any observable improvement in their farm production, families' standard of living or any benefits of the credit accessed. This is evident from their inability to pay back their loans as well as their dependence on further loans for farming, year in and year out. Thus their inability to provide basic needs for the family. The study therefore hopes to find out how rice farmers access and manage credit to improve their families' standard of living.

1.3 Research Questions

- 1) What credit packages are available and how accessible are these packages to rice farmers at Kpong?
- 2) How beneficial are credit facilities to improvement of family livelihood of rice farmers.
- 3) What relationship exists between timely accessibility of credit and management of credit?

1.4 Objectives of the Study

1.4.1 Main Objective:

The main objective of the study is to find out how rice farmers access and manage credit so as to improve their families' standard of living.

1.4.2 Specific Objective:

The specific objectives of the study were to:

1. Find out about available credit packages for rice farmers at KIP.
2. Examine reasons why rice farmers at KIP access credit.
3. Determine the benefits (if any) that rice farmers derive from using credit.
4. Evaluate the problems (if any) that rice farmers encounter with the use of credit
5. Asses how rice farmers manage the credit taken.

1.5 Hypotheses

HO₁ There is no relationship between source of credit accessed and the use of credit.

HO₂ There is no relationship between type of credit facilities accessed and income of farmers.

1.6 Significance of the study

The findings of the study would:

1. Add to existing literature on access and management of agricultural credit by farmers.
2. Provide information which would contribute to increased rice yields and therefore to food security, self-sufficiency and a better standard of living of families.
3. Help credit providers put in place a sustainable, efficient and effective credit scheme that would help improve the welfare of families.

1.6 Definition of terms

Credit –

In the context of the study credit is defined as the providing goods, services and cash and paying at a later date.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter discusses what credit is, factors that affect credit use and its importance to farmers as well as institutions that provide credit. It also discusses what irrigation is, its importance and bottlenecks faced with irrigation projects. Finally, the review includes rice production and challenges faced by rice farmers in Ghana as well as management of credit.

2.1 Definition of credit

Credit is any form of deferred repayment. Credit is the trust which allows one party to provide resources to another party where the second party does not reimburse the first party immediately but instead arranges to repay or return those resources at a later date (Finlay, 2009; Ingham, 2004). Owusu Acheampong (1986) also defines credit as temporary transfer of capital resource from an individual or institution to another person or institution for a specific period of time, purpose and at an agreed interest charge. Bannock and Manser (1989) viewed credit as granting the use of goods and services without immediate payment. Credit is an important mechanism for providing food security in growing and diversifying rural communities in many low income countries (Nsiah-Gyabaah and Edusah 1985). In the context of the study credit is defined as the provision of goods, services and cash and paying at a later date.

2.2 Types of Credit

There are two types of credit- Consumption and Production credit. Consumption credit is granted for the purpose of acquiring consumable goods and services whiles Production credit is advanced for acquisition of factors of production. This could be in the form of cash credit, inventory or input credit.

2.2.1 Consumption Credit

This is granted for the purpose of acquiring consumable goods and services by the application of which no further financial returns can be generated to enable the borrower pay off his debt. Consumption credit provides security for enterprise funds to be used in productive activities. Example of such goods are food and meat items, clothing, funeral expenses, school fees, emergencies such as sudden needs to travel or accidents and marriage expenses. Consumption credits are usually accessed as cash credit or inventory credit. Raeburn (1984) recommends that lenders should understand all the loan needs of borrowers so that farm economic plans can be complete and household consumption plans consistent with them.

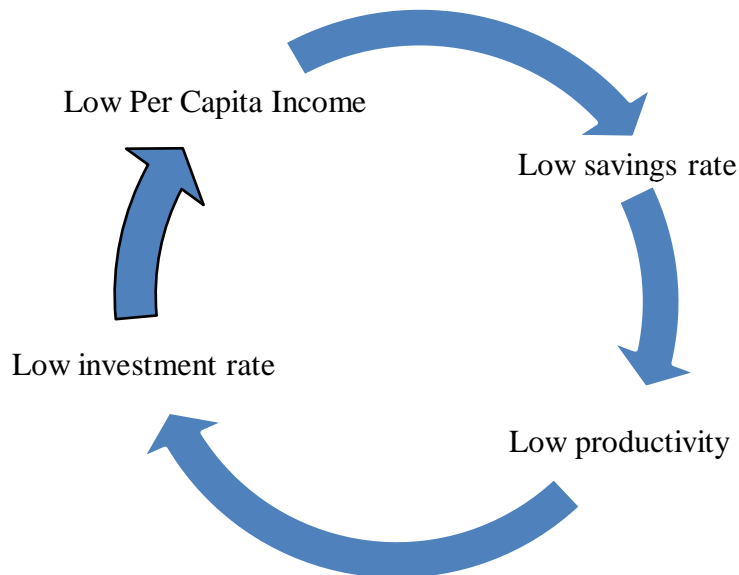
2.2.2 Production Credit

This is the credit advanced specifically for acquisition of factors of production, the application of which greater financial returns are generated from the enterprise to which the factors are applied. Examples are farm inputs, such as fertilizers, insecticides and improved seeds; labour, land and management (Owusu Acheampong, 1986). Production credit can be served to client as input credit, cash credit or inventory credit.

2.3 Importance of Credit

The concept of credit in agriculture has been known since the seventeenth century when peasants in China used credit in farm production to increase their cash income, and to improve their standard of living (Ming-te, 1994). Also, in Western countries, the German Landshaften was founded by Frederick the Great in 1769 and its principles were used by the Federal Farm Loan System of the United States. According to Heidhues and Schrieder (1999), the origin of the credit concept stems from the necessity of break the vicious circle of low capital formation.

Fig 2.1: The Vicious circle of low capital formation



Source: Heidhues & Schrieder, (1999)

Fig 2.1 shows that the formation of capital is influenced by per capita income, saving rate, investment rate and productivity. A low level in any of these factors will impact on capital formation and ultimately the standard of living of families. The role of credit programs is to break this vicious cycle of low capital formation, resulting in an increase in per capita income and thus an increase in saving rate, Investment rate and productivity (Heidhues & Schrieder, 1999) and eventually in the standard of living of families. Families would be in a better position to provide for the basic needs of its members. This may happen only if credit is managed effectively.

Availability of credit can be the leading edge of rural development. Credit can be employed to extend the total area under cultivation and invariably output. Farmers can further acquire farm machinery and equipment that can help increase acreage and also buy and use important inputs such as improved seeds, weedicides, pesticides and fertilizer. Credit provision to the poor makes a lot of difference to the poor by raising their per capita income and consumption as well as household net worth, thereby increasing the probability that the beneficiaries lift themselves out of poverty (Khandker, 2002) and provide for their basic needs. Provision of credit to smallholders helps households and individuals to achieve food security and alleviate their

poverty (IFPRI, 2002). In Peru, it was observed that households receiving credit were better off than their non-beneficiary counterparts and attributed some of these benefits to the participation of beneficiaries in the Microloan program (Dunn & Arbuckle, 2001). Credit provision to the small farmers allows small farmers some portion of cash necessary to pay for harvest labour. This helps to eliminate the well-established custom of selling the first part of harvest to local intermediaries (middlemen) who purchase at lower than competitive prices in return for cash advances (Morss et al, 1975).

The provision of credit to smallholders especially women is not intended only for increasing productivity but also to contribute to their empowerment (Goetz & Gupta, 1996). German Technical Cooperation (GTZ) (1998) in a research study for Bank of Ghana observed that the average income of those who borrowed were higher than the average income of all the respondents of the survey. Microfinance provision offers unique opportunities to combine a genuine humanitarian aid for the poorest with good opportunities for trade and investment (Harper, 1998). Access to credit has the potential to significantly reduce poverty (Khandker, 1998) and has been found to strengthen crisis coping mechanisms, diversify income earning sources, build assets and improve the status of women (Hashemi et al, 1996; Montgomery et al, 1996; Murdock 1998; Husain, 1998).

Finally, with credit, the farmer can increase his or her productivity which will ensure greater farm output and increase income. Credit is essential for agricultural development and is often a key element of agricultural modernization. It cannot only remove a financial constraint but it could also increase production and income, and may accelerate the adoption of technologies (Atieno, 1997). It can improve income by enabling the undertaking of additional income generating activities, and the rural households also can finance more consumption and have surplus finance available for further investments (Rosenzweig, 2001). Also, credit facilities will help farmers purchase modern inputs such as high-yielding varieties of seeds, fertilizers, and install irrigation to increase production (Vicente & Vosti, 1995).

At various points in time farmers rely on external credit because as producers they prefer to hold their savings in physical productive assets on their own farms. It can be noted that farm

income and expenditures do not occur at the same time (Desai & Mellor, 1993). A good example of this is a rice farmer who harvests his crops twice or thrice a year whereas his consumption expenditure is continuous. Likewise, for a tree-crop farmer there is a big gap between the times when income is generated and when expenditure is incurred (Desai & Mellor, 1993). Moreover, in the event of unforeseen situations such as bad weather, accidents and illness, rural households usually resort to emergency sales of assets and borrow from family and the informal sector (Chowdhury & Garcia, 1993). The poor have traditionally obtained credit services almost exclusively from informal networks because they have little or no collateral to offer (Zeller et al, 1997).

The majority of poor small farmers in developing countries are left out of agricultural extension and credit systems (Lal et al, 2003). These households are characterized by landholding of less than 1 hectare and very low crop yields. These rural households are unable to grow enough food to feed themselves even though they focus much effort on producing food crops (Lal et al, 2003). It has been noticed that most of the farmers are too poor and cash-strapped to be able to benefit from any kind of access to credit (Diagne & Zeller, 2001).

2.4 Sources of Credit for Farmers

Rice farmers access credit from different sources for their farming in order to realize improvement in their lives. Littlefield, Morduch and Hashemi (2003) also explain that credit is expected to enable the poor increase their household incomes, build assets and also reduce their vulnerability to crisis. These in turn will enable the poor invest in education, health and meet a variety of other cash investments. The financial system in Ghana falls into 3 main categories: informal, semiformal and formal financial institutions.

2.4.1 Formal Institutions

Under the formal sector are mainly banks. These are Commercial banks, Development banks, Merchant banks, Rural and Community banks. They are incorporated under the Company code 1963 (Act 17a) which gives them legal identities as limited liability Companies and they are

licensed by the Bank of Ghana (BOG) (Steel and Andah 2002). These formal financial institutions are not popular in most rural communities because of certain features like cumbersome saving and lending procedures, lack of conventional collateral for low income clients, general banking regulations which discriminate against low income savers and low interest rates for savings (Miracle and Cohen 1980). The share of small holder credit in Commercial banks is on the decline. ADB's total lending declined to 15% in 1992 while the share of lending to agriculture fell to 30% (Nisaanke and Aryeetey (1998) as cited by Steele and Andah (2002). Credit from formal sources often involves delays and completion of many formalities too complicated for the unsophisticated small scale and often illiterate entrepreneurs (Nsiah-Gyabaah&Edusah,1995).

2.4.2 Semi-Formal Financial Institutions

The semi-financial institutions consist mainly of savings and credit cooperatives also known as credit unions, rural and community banks and non-governmental organizations. Credit unions are voluntary self-help associations which are usually organized on work place basis. (Aryeetey1996). Their main activities are encouraging savings among members and lending is limited to their members. They are usually urban based, formally registered but not licensed by the Bank of Ghana (Steel & Andah, 2002).

A cooperative is a voluntary, democratically controlled association of people with the specific purpose of conducting some sort of business. Voluntary associations are established for all kinds of social, political, cultural, recreational or defensive purposes. The essence of a cooperative is that it is owned by its members who are its customers and it is an important element for reaching small farmers. The principle behind establishing such a society is that a group of small farmers which is legally constituted as cooperative society can borrow on better terms, can shoulder some of the costs of loan administration and can offer better security than individuals borrowing on their own account (Poliquit 2006).

In most countries, the cooperatives are weak and they cover only a small portion of the population and provide only a slight fraction of total credit needs of small farmers (Desai

&Mellor, 1993). However, in some other countries, cooperative credit is an effective tool for farmers. Some of the collective farm or previous agricultural financing follows some of the same principles in the formation of such cooperatives (OECD, 1999; Suresh, 1991). Furthermore, agricultural credit cooperatives provide a venue for farmers to save and promote recycling of funds in the farming sector (Mahalingam, 1996; OECD, 1999). NGOs usually have poverty reduction as their focus. They are not licensed to take deposits from the public and so have to use donor funds for micro credit. In the northern part of Ghana for example a lot of NGOs like Action Aid, World Vision, Technoserve, United Nations Development Programme (UNDP), Adventist Development and Relief Agency (ADRA), have helped to provide credit for the poor. These NGOs play a positive role in the lives of the poor by simply increasing the range of credit options available to them (IFAD, 2003).

2.4.3 The Informal Financial Institutions

The informal financial sector includes self-help groups known as micro saving schemes. They include Susu, Rotating Savings and Credit Associations (ROSCA's), Accumulating Savings and Credit Associations (ASCRA') and informal financial agents which include money lenders, traders, pawn brokers as well as friends and relatives (Aryeetey,1998). These informal institutions were usually set up by village workers with the aim of achieving the needs of its members. The union provided members with mutual aid such as support in times of unemployment, sympathy and financial assistance in the case of emergency. Self-help groups are also defined as voluntary groups valuing personal interactions and mutual aid as means of altering or solving the problems of its members (Zeller et al, 1997). The self-help groups are an important source of informal loans in many developing countries and play an important role in rural credit as an efficient channel of credit to the rural poor (Rangarajan, 1994). It has been a long tradition in developing countries that groups designed like self-help groups (SHG's) are used by members to cope with daily financial problems (Lal et al, 2003).

Susu is where an individual collects money from people in the informal sector, keeps it and gives it back to them after a definite period. Money lenders are supposed to be licensed by the Police under Money lenders ordinance 1957 (Steel & Andah, 2002). Money lenders are a major source

of revenue for farming and many other small scale economic activities. Nsiah Gyabaah et al. (1992) described ROSCA's as a group of participants who make regular contributions to a fund in whole or in part to each member in turn. ROSCA's are a cheap form of credit that normally does not attract interest. ROSCA's have provided entrepreneurs with necessary capital to start a business, replace trading stock and buy machinery.

These informal institutions operate without physical collateral and involve small loans and short term transactions. Informal finance is usually based on mutual trust because they operate outside controlled legal regulations. Non material collateral such as character, reputation, kinship and family ties play an important role in borrowing from informal sources. In the Philippines for example it is estimated that about two-thirds of the farmers borrow from informal lenders (Tolentino, 1988; Santos & Guce, 2001). Informal institutions seem to be doing well due to the following reasons: their proximity to their clients, easy access at anytime, quick processing in which collateral is not obligatory, repayment flexibility, lower transaction cost for borrowers and savers (Jackelen & Rhyne, 1991; Kashuliza, 1993).

2.5 Credit Use By Families

There are many reasons why consumers (including families) use credit and these can be classified into four main categories, for convenience, to obtain something before saving enough to pay for it, to bridge the gap if income is insufficient and to consolidate debts or loans (Brown, 2008).

Convenience: One advantage of credit is its convenience. It reduces the need to carry large amounts of cash and allows for the payment of several expenses at a time. In short credit is handy. For instance, instead of carrying cash around one is able to pay bills and make purchases with credit (Brown, 2008). This in the long run is safer too in a country where there is an increase in robbery.

Immediacy: Credit allows consumers (including families) to have things immediately while paying for them later. For instance families are able to purchase highly priced goods like automobiles, refrigerators, furniture, electrical gadgets and pay for them in the future (Scott,

2005). It allows you to readily acquire and enjoy the use of a good or service perceived to be expensive while you pay for it later. In the case of farmers, they are able to purchase farm inputs, to install irrigation, purchase high yielding variety of seeds, fertilizers and machinery in time for the planting or farming season (Vicente and Vosti, 1995) and then pay back later

To Bridge the Gap: According to Brown (2008) individuals with an irregular income (e.g. self-employed persons) may require loans to pay regular costs until the next income cheque is available. Even with a regular income, people live from pay check to pay check so if salaries have not yet been paid and there is an urgent need to be met; there could be a financial crisis. There may not be enough money to cover reasonable needs like education expenses, medical bills, buy food, and other essential items (Brown, 2008). Credit serves as an emergency source of funds since you are able to obtain money in a relatively short time to meet or address any temporary shortage in funds. With regards to farmers, since farm income and expenditure do not occur at the same time, there is a need to access credit to bridge the gap in expenditure while waiting for the next income after the sale of farm produce (Desai & Mellor, 1993).

Consolidation Loans: When expenditure including bills and debts exceed income, some people borrow enough to repay all outstanding debts and rather owe a larger amount to only one lender for a longer time (Brown, 2008). Anecdotal evidence has it that some traders/ farmers borrow more than enough to pay all their old debts and have some money left to start a new business.

Apart from these four main categories families use credit:

- **For lifecycle needs:** such as weddings, funerals, childbirth, education, homebuilding, widowhood, old age.
- **For personal emergencies:** such as sickness, injury, unemployment, theft, harassment or death.
- **For disasters:** such as fires, floods, cyclones and man-made events like war.
- **For investment opportunities:** expanding a business, buying land or equipment, improving housing among others.
- **For sudden emergency.**

- **To build credit record:** Responsible borrowers have the opportunity to establish a good credit rating, making it easier for them to obtain credit for future dealings. For young people, using a small amount of consumer credit helps to establish a good credit rating. A good credit rating becomes important if you need to borrow money for a financial emergency or large purchase.
- **To avoid borrowing from friends and relatives.** Consumer credit enables individual's access funds when needed without having to ask relatives or friends for money. It also keeps them from borrowing from less-than-reputable individual or companies that charge astronomical interest. Borrowing from friends and family may cause rifts, disagreements and fallout, so having a credit line with a credit card company or lender helps reduce such situations and keep transactions private. This also ensures that there is interpersonal relationship between family and friends.
- **To increase household income:** Littlefield, Morduch and Hashemi (2003) also explain that credit is expected to enable the poor increase their household incomes, build assets and also reduce their vulnerability to crisis. These in turn will enable the poor invest in education, health and meet a variety of other cash investments.

The review of literature presents information about reasons why credit is used by individuals and families. These reasons are varied. It can be deduced from the review of literature that if credit is managed or used effectively, it is beneficial to individuals and families and vice versa.

2.6 Factors That Affect the Use of Credit

The assumption underlying the provision of credit to smallholder farmer is that farmers will put the credit accessed to economically viable and feasible use and ultimately result in increased productivity and subsequently improved standard of living. In spite of the above assumption, credit advanced can be used for various purposes. In addition to use for productive purpose, credit can also be used to service family expenses, refinance old debts as well as for home repairs. The proportion of credit used in productive activities can be affected by the time of

delivery of credit. The untimely (late) delivery of credit may predispose the farmer to use it on alternative activities including consumption since most agricultural activities are seasonal. The level of knowledge or skill of the farmer in the enterprise for which credit was advanced may also influence his ability to use the loan for productive purposes (Ledgerwood, 1999).

The number of dependent relations of borrowers could influence the use to which he/she will put the loan. The more the number of non-working dependents a borrower has the likely the desire and pressure of using some of the funds to attend to needs of these dependents. Time of delivery of credit can influence the subsequent use of credit. Untimely delivery of credit could result in the use of the loan for different activities from what was originally planned due to seasonality of agricultural activities. The age of the borrower can also influence the use of the credit. Generally old age reduces the ability of the borrower to effectively utilize the loan. One other factor that affects the use of credit is the perception of the borrower about credit fund and the source of the fund. If the borrower perceives the funds advanced to him as a gift, definitely the use to which he will put funds will be different from if he perceives the credit as a facility to be used to generate income and pay the loan principal and the interest on the loan after a stipulated period. Other factors that affect the use of credit are loan size and interest rate (Johnson & Rogaly, 1997).

The use of credit for production activities is expected to lead to increased productivity. While consumptive use of credit may not directly lead to improved productivity, it may indirectly influence productivity since it frees up household's productivity inputs and enterprise revenue which can be put back into the business (Ledgerwood, 1999).

Loans taken to sustain consumption are successful only if they add sufficiently to withdrawals during periods when these would otherwise be unsatisfactory (Raeburn, 1984). For production loans, the loans should be closely related to knowledge of production and market condition so that farm plans are well made and executed.

2.6.1 Loan Sizes

The size of the loan to an individual may influence what activity he may eventually use it for. A loan amount worth one-eighth of enterprise requirement may discourage the borrower from using it for the enterprise activity since it may be too small to carry out the activity. Similarly loan values far above what the borrower actually needs will result in the excess funds being used on unplanned and non-productive activities for which the borrower may not be able to repay when the loan repayment time is due. It is argued that the higher the loan amount, the more income the farmer generates and the more he may increase his means to purchase inputs for business.

During a study on the impact on credit on small holders, Atengdem (2002) found that there were high rate of loan default among beneficiaries who access lower levels of credit. However Wampfler (2001) was of the view that small sums for short periods have positive impact on individual and household cash flows, smooth out irregularities in consumption and can to some extent strengthen economic resilience. Some microfinance organizations in an attempt to ensure that relatively well-off people do not crowd out others' (the poor) gives small loan sizes so that better off individuals do not become interested in them (Johnson and Rogally, 1997).

2.6.2 Interest Rate

Interest rate may be defined as the amount of money paid by borrowers for using borrowed funds, stated as a percentage of the amount borrowed (Eckaus, 1972) or the price of money (Johnson and Rogaly, 1997). It can also be seen as the amount of money earned by lenders for supplying loanable funds, stated as a percentage of the amount of the loan. Borrowers are demanders of loanable funds and lenders are suppliers of loanable funds. It could be likened to the motivation to store seeds for use during the next season even though production for current season could hardly take farmers through the year.

To the lenders, the interest is what he will use to pay for the cost of the funds, cost of providing loan and cost of default (Johnson and Rogaly, 1997). The level of interest rate plays a major role in determining the sustainability of any credit scheme. While credit beneficiaries will prefer low interest rate, it has a lot of adverse effect on the future sustainability of these schemes. There

continues to be a debate as to what constitutes an appropriate interest rate to be charged on smallholders loans. The provision of interest in the failure of many development finance institutions to reach their target groups (Robinson, 2001).

Low interest rate encourages the diversion of most of the funds to larger farmers even under highly supervised credit schemes (Bottrall, 1976). The reason being that with time credit institutions come under pressure to depend less on government funds and their usual reaction is to reduce administrative cost. The low interest rates do not allow revenues high enough to cover the higher costs of providing numerous loans to smallholder farmers, thus they concentrate on lending to their larger members as a consequence.

Low interest rates also have socially undesirable effects on the pattern of large farmers' investment, encouraging them to purchase imported consumption items, capital-intensive equipment, including farm machinery and additional land. In certain cases they enable larger farmers to re-lend to small farmers at higher rates. Low interest rates also do not encourage savings deposits. Subsidized credit schemes are thus likely to provide a highly inefficient and expensive way of providing welfare. Thus very poor people could best be helped not through subsidized credit but rather through other means such as relief programs, development of alternative employment opportunities such as rural works and 'presidential special initiatives' Subsidized credit programs were not only depriving rural development but were actually slowing it down (Robinson, 2001). High interest rate in contrast to low interest rate is relatively unimportant to the short-term smallholder borrower compared with rise in inputs prices or drop on producers' prices. High interest rate will also induce large farmers to release funds from less productive uses and make available to small farmers. Further lending institutions would find it easier to cover cost of administrating small farmers' loans and also savings would be stimulated. There are many instances where poor borrowers were paying much higher interest rates to local money lenders and it seemed that they would generally welcome rates that banks would charge (CGAP, 2002; Robinson, 2002). Smallholder credit administration is expensive because of the small size of loans and the high cost of supervision (CGAP, 2002). High interest rates do not seem to affect small farmers' willingness to borrow or availability to repay borrowed funds.

Morss et al (1975) in their empirical study of Rural Development Project observed that high interest rates do not appear to affect smallholder farmers' willingness to borrow or ability to repay borrowed fund. Interest rates are set with the aim of providing viable, long term financial services on large scale. To reach good degree of sustainability, MFs must set interest rates that cover all administrative cost plus the cost of capital (including inflation), loan losses and provision for increasing equity. Morss et al (1975) were of the view that low interest rates for credit designed for smallholder farmers will attract the larger and more powerful farmers, pushing aside intended recipients and also high interest rates do not seem to affect smallholder farmers' willingness to borrow or ability to repay borrowed funds. Therefore microcredit interest rates should be set with the aim of providing viable, long-term financial services on a large scale. Unless this is done, MFs will only operate for a limited time, reach limited number of clients and will tend to be driven by donors or government goals and not that of the client. Only sustainable MFs can provide permanent access to hundreds of millions who need them.

2.7 Characteristics of Small Holder Farmers

A small holder farmer is an individual who owns or cultivates up to two hectares (2ha) of farm land (Jazairy et al 1992; Siryh et al 2002). Tinsley (2004) outlined some features of some small scale farmers. These include:

1. Working with limited resources (this could be land, labor or capital – financial resources).
2. Being entrapped in poverty,
3. Not being able to produce enough to get adequate income. Their incomes are spent on basic essentials food and clothes and they are at risk of nutritional deficiencies because their incomes may not able to buy enough food containing the required nutrients for the whole family.
4. Experiencing food deficits at certain times of the year because they are not able to produce all year round. The beginning of the rainy season is when these food deficits are most serious.
5. Their lifestyle being characterized by toil and discomfort. They do not have enough sleeping space and sometimes have to share rooms with their farm produce.
6. Being driven by the pressure of credit and domestic demands to sell their produce early.

Wright (2001) also observed that rural households do not have only one source of income, rather depending on season, price and other contingencies, they pursue a mix of activities that may include growing their own food, laboring for others, running small production or trading business, hunting and accessing loans or subsidies from states, friends and Nongovernmental organization (NGO). Due to the small holding of small holder farmers coupled with their high dependency ratio they are generally poor. This poverty situation limits their capacity to access production inputs especially finance. Access to finance however is limited to few people and is particularly a problem to small holder farmers and more so with women than men (SPORE, 2000). ISSER (1999, 2002) and NDPC (1997) also attribute the poor food production and supply to inadequate access to finance and capital among other factors.

Lack of credit is the one single constraint to the adoption of fertilizer usage or other innovation in agricultural production. It is also a major constraint on the expansion and improvement of crop activities for small holder households (IFAD, 1989; Ahenkora et al, 1994; Brynes, 1978). According to Atengdem (1991) all farmers realize the need for credit to improve their productivity and income however only very few small holder farmers benefit from formal bank credit. Wampfler (2002) observed that short term loans involving small sums (and often targeting women) have a positive impact on individual and household cash flows, can smooth at irregularities in consumption and to some extent strengthen economic resilience. Zeller and Sharma (1998) also observed that there can be no meaningful development in most developing countries without improving the accessibility of the poor to credit. Diagne (1998) recognizes the effect of credit on small holders' productivity. However he holds the view that land scarcity coupled with unfavorable terms of trade for the small holder's farm products remain by far the factors that most constrain household income and growth.

2.7.1 Socio-economic characteristics of Rice farmers in Ghana

Rice farming is characterized by the diverse socio-economic characteristics of the farmers involved. The socio-economic characteristics of rice farmers describes the demographic characteristics of the rice farming population such as gender, age, income, level of education, location and land ownership. Rice contributes not only to world food security, but its cultivation

is also necessary in providing income and employment for farmers and individuals in rice cultivating activities (Norman & Kebe, 2006). This section of the literature review, describes the socio-economic characteristics of rice farmers and their households briefly under the following demographic features or themes: land tenure, ownership and irrigation systems practiced; income and employment; rice and gender.

2.7.2. Land Tenure, Ownership and Irrigation systems practiced

Land use patterns in Ghana have developed closely with various land tenure systems. Land tenure system refers to the relationship between a tenant and a landowner in the acquisition, occupancy and use of a piece of land. According to the KIP completion report by ADF (2005), the KIP was implemented on customarily owned lands, thereby displacing original owners/occupants of those lands. This form of ownership brought about social disturbances amongst the farmers, which was later resolved and displaced farmers compensated accordingly.

A majority of the irrigable land in Ghana owned by Ghana Irrigation Development Authority (GIDA), by legislative instrument and leases them out to interested inhabitants of the areas concerned on short term basis (Amoatin & Acheampong, 1997). The lands acquired by GIDA for irrigation development were distributed first to residents whose farmlands were affected by the project, and later to other interested members of the community. According to Amoatin and Acheampong (1997), the average landholding for an irrigated plot is 0.84 hectares, while that for upland farms are 1.5 hectares. However, the size being allocated to each farmer depends on the net irrigable area and the number of interested farmers.

2.7.3. Income and Employment

The main focus of rice cultivation from the point of farmers is to provide employment and subsequently gain income. Thus, without marginal income generation rice production cannot be seen as a profitable business venture. Households depend on irrigated rice production as a major source of family income, supplementing rice incomes through upland farming of cassava, plantain, maize and yam or petty trading by the female members of the households (Amoatin & Acheampong, 1997).

The tentative question in rice production then becomes, why grow rice? Kranjac-Berisavljevic *et al* (2003) in a survey of 32 rice farming villages (including the Asutsuare Area-KIP) on their purpose of growing rice concluded that majority of rice farmers grow rice for household consumption and income to meet basic family needs. According to the ADF report (2005), the average participating farmer in the KIP realized major increases in income levels even though the targeted levels of income in the initial project appraisal report were not met. These increases in income levels compared to that of pre-project figures were very substantial in sustaining livelihoods. Alhassan (2008) however notes that the level of income generation of rice farmers is dependent on the technical efficiency of the various activities they perform on their farms. The technical efficiency of farmers refers to the use of human resources to improve upon the efficiency in rice farming; this involves providing farmers with education and extension contacts (*Ibid*). The main determinants of technical efficiency were cited as age, family size, education, and extension; this also influences the level of income gained by farmers.

2.7.4. Rice Production and Gender

The sexual division of labour is predominant in Ghana and some steps have been taken to mainstream gender issues in agriculture. In FASDEP I and II, which are both policy documents on agriculture, gender inequality and discrimination against women have been identified as constraints facing the agricultural sector. One area in Ghana where such discrimination takes place is the Northern Region, where women are not allowed to own land but are only allowed to work on farm lands of their husbands, uncles and brothers (Kranjac – Berisavljevic *et al*, 2003).

Land allocation in irrigated farming is also based on gender because nearly 80% of irrigated land is controlled by men (Alhassan, 2008). In most parts of Ghana, men predominantly undertake land preparation activities, while women undertake lighter but equally labor intensive tasks such as winnowing. In the past two decades, it has been well recognized that men and women have complementary labor roles. This has led to the mainstreaming of gender related issues in all economic and social activities, which is also an important dimension of alleviating poverty (FASDEP II, 2007). According to the ADF report (2005) gender mainstreaming and social inclusion have been used to alleviate poverty, a lot more women and the youth have been

employed in rice farming and this has led to an increase in the incomes of women participating in the project.

2.8. Impact of credit on irrigated rice production

Irrigated rice production due to its small-medium scale characteristics - (that is low incomes, insufficient input, and low capital formation) - creates the need for farmers to access credit. The availability of credit to farmers is one of the best ways of improving not only on agricultural production in general, since there's the possibility of farmers to improve upon technologies and resources available to them (Asiedu & Fosu, 2003; Kranjac–Berisavljevic et al, 2003), but results in more income to help improve families standard of living. The impact of credit is usually centered on the alleviation of poverty, covering capital requirements, and sustainable livelihood of farmers and their households. A study on the impact of micro-credit in alleviating poverty in Pakistan, reveal that; low income farmers who had access to credit were able to increase incomes marginally over a period of time (Saboor et al, 2009). Also the general introduction of credit systems in agricultural production has allowed farmers to access the required inputs needed to increase productivity and improve upon their efficiency (World Bank, 2004).

The main reason for farmer- household demand for credit/ financial services is to allow them cover their investment and capital requirements (Namara et al, 2011). According to Namara *et al* (2011), despite the high terms of credit (minimum of 22%) - farmers' household requirements for credit allows for them to develop wells, acquire water lifting equipment and to cover other financial expenses in irrigated rice production. However, the impact or effectiveness of credit can also be measured by the increased output in terms of production, general welfare of households, employment creation and community development of farming communities (Essel and Newsome, 1995). Essel and Newsome (1995) further states that there is not enough credit for direct production including agriculture and that credit made available by Rural banks to community inhabitants must be shifted to direct producers who will invest in productive activities. In northern Ghana, rice farmers were able to increase their productivity as a result of credit obtained from a similar project as the KIP. The credit obtained and the use of improved techniques such as improved seeds; which were obtained with credit money, ensured an increase

in yield from 19-25 bags/acre in some riceproducing communities in the Upper-East Region (Defoer & Loosvelt, 2010).

The impacts of the credit component of the KIP are not well known, the ADF completion report and a study on increasing productivity of the KIP raises issues of sustainability of the credit component of the project (ADF, 2005; Tinsley, 2009). The ADF report for instance, states that the KIP implementation credit has had a mixed performance record. This was as a result of shortcomings in project management and non-realization of rice marketing infrastructure (communal drying floors and storage facilities). However, there has been an overall change or increase in income of beneficiary farmers of the project; even though they represent a small percentage of the total population of the community (Tinsley, 2009).

2.9 Definition of Irrigation

Irrigation is the artificial application of water to the land to assist in the growing of agricultural crops, maintenance of landscape and re-vegetation of disturbed soils in dry areas and during periods of inadequate rainfall (Snydar et al, 2005). The goal is to supply just the right amount of water without over doing it or damaging the soil vegetation. Nutrients may also be applied via irrigation.

2.9.1 Types of Irrigation

There are several types of irrigation systems which are classified based on: how much water is required, when the water is distributed, what materials are needed, and what is the most efficient and feasible design. The major irrigations types include:

- a. Ditch Irrigation:** Ditch Irrigation is a rather traditional method, where ditches are dug out and seedlings are planted in rows. The plantings are watered by placing canals or furrows in between the rows of plants. Siphon tubes are used to move the water from the main ditch to the canals. This system of irrigation was once very popular in the United States of America (USA), but most have been replaced with modern systems. This

system is similar to what is practiced at the Kpong Irrigation Project where the farmers get their source of water from the laterals connected to the main canal.

Picture 2.1: Sub carnal showing a type of ditch irrigation



(Source: Kpong Irrigation Project)

- b. Terraced Irrigation:** This is a very labor-intensive method of irrigation where the land is cut into steps and supported by retaining walls. The flat areas are used for planting and the idea is that the water flows down each step, while watering each plot. This allows steep land to be used for planting crops.

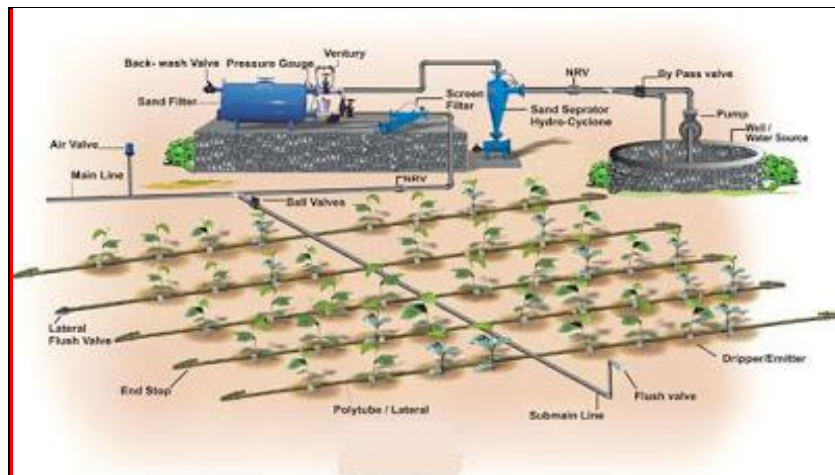
Picture 2.2: Terraced Irrigation



(Source: 123RF Stock Photos, 2013)

- c. **Drip Irrigation:** This is known as the most water efficient method of irrigation. Water drops right near the root zone of a plant in a dripping motion. If the system is installed properly one can steadily reduce the loss of water through evaporation and runoff.

Picture 2.3: Terraced Irrigation



(Source: Agriculture Philippines, 2012)

- d. **Sprinkler System:** This is an irrigation system based on overhead sprinklers, sprays or guns, installed on permanent risers. You can also have the system buried underground and the sprinklers rise up when water pressure rises, which is a popular irrigation system for use on golf courses and parks.

Picture 2.4: Sprinkler System Irrigation



Source: National Geographic photos, (2013)

- e. **Rotary Systems:** This method of irrigation is best suited for larger areas, for the sprinklers can reach distances of up to 100 feet. The word “Rotary” is indicative of the mechanical driven sprinklers moving in a circular motion, hence reaching greater distances. This system waters a larger area with small amounts of water over a longer period of time.

Picture 2.5: A Rotary Irrigation System



(Source: Hessenaver Sprinkler Repair & Irrigation, 2013)

- f. **Center Pivot Irrigation:** This is a form of overhead irrigation. Steel or aluminum pipes are joined together, supported by trusses, mounted on wheeled towers. The sprinklers are situated on the length of the tower and they move in a circular motion.

Picture 2.6: Centre Pivot Irrigation



(Source: California Agriculture, 2013)

The review of literature shows there are a variety of modern irrigation systems but then the KIP rice farmers still use the traditional Ditch Irrigation system.

2.9.2 Importance of irrigation systems

There is no doubt that water is one of the most important inputs in agricultural production in Ghana apart from labor. More importantly, almost all agricultural production depends on natural rainfall. Because of this situation, crop yields are invariably poor when the rains fail, come too early or too late since there can literally be no control over this important input. Irrigation is also needed because of the odd dry year, such as the one that occurred in Ghana in 1983 since the timeliness of rains seriously affects agricultural operations (Kyei Baffour, 2006)

Irrigation increases food security and improves living standards in many parts of the world. Irrigation assists with both food production and cash crops enabling farmers and surrounding communities to benefit both directly and indirectly from the crops produced. In large-scale commercial farms, it enables crop production for local and export markets with significant impacts on the country's economy. Irrigation helps to reduce poverty at household level. It has major positive impact at household and village level and contributes significantly to poverty reduction strategy. Irrigation helps to reduce rural-urban migration. This can be achieved if both existing productivity in the rainy season is increased and made more reliable and the return to dry season casual labor exceed the alternative casual urban or construction employment (Chiza, 2005). The cultivation of crops with longer duration is impossible or risky without irrigation as happens in places like Navrongo (the dry season tends to be distinct and long nearly seven to eight months) (Kyei Baffour, 2006). The feasible land base for agriculture can be expanded with irrigation.

2.10 Rice Production and its demand in Africa

The theme "Rice is Life" was adopted to implement the International Year of Rice (IYR) 2004, declared by the United Nations General Assembly during its 57th Session (UN Report, 2004).

This indicates the contribution of Rice production in the economy of most developed and developing countries. It is a known fact that, rice is a staple food for many Africans and constitutes a major part of the diet for many others. During the last three decades, the demand for rice has increased steadily, playing a major role in the strategic food security planning policies of many countries (Gipson, 2006).

With the exception of a few countries which have attained self-sufficiency in rice production, rice demand exceeds production in most countries and large quantities of rice continue to be imported to meet domestic demands at a huge cost in foreign currency FAO (1975). In Ghana, for example, rice imports increased from US\$100 million in 1999 to US\$200 million in 2005 when national rice demand rose to 700 tons (FAO, 2005). African's inability to achieve rice self-sufficiency is as a result of major constraints in the entire chain of the rice production industry. Many are of the opinion that, it is necessary to minimize over reliance on rice imports for meeting increasing domestic demands whiles local resources and strategies are exploited at all levels in promoting increased rice crop production.

2.10.1 Rice and Food Security

Food security has been defined as 'access' by all people at all times to enough food for an active healthy life". Food security at household level is also important for ensuring a good livelihood and freedom from hunger (Armstrong, 2005). In countries where rice is the staple food rice plays a very important part in food security and socio-economic development. As a food crop, rice has some inherent characteristics which make it attractive, in particular for small – scale farmers as well as for the urban poor and rich Stiglitz (1993). It is rich in carbohydrates and provides energy; it is available all year round because of its long shelf-life, making it preferable to other crops for food security. A combination of factors also influences the increase in rice consumption. Number one is the fact that, urbanization is a major factor causing the shift in consumer preference towards rice. Rice dishes are comparatively easy to prepare compared to other traditional cereals, such as sorghum, maize and millet, thereby reducing the work involved in food preparation. Rice, therefore, fits easily into urban lifestyles, which tend to be crowded with a multitude of time-consuming activities.

Rice production is also a major source of employment, income generation and nutrition in many poor food-insecure countries F.A.O. (2008). The numerous farming activities provide employment to millions of people who work either directly in rice production or in related support services. After harvesting rice, farm activities shift to post-production operations, namely harvesting, threshing, drying, milling, storage and trade (Pardey, 1992). The preparation of milled rice for consumption, the transformation of milled rice to other products and the utilization of broken rice, rice bran, rice hull and husks and rice straw provide additional employment opportunities for a large number of people. The income generated from rice cultivation and post-harvest activities provides cash to cover the expenses of clothing, housing, education and other social activities of the majority of people in rural areas.

In countries such as the Gambia, Guinea and Madagascar, sustainable rice production is the key to the improvement of rural livelihoods, not only of small rice farmers but also poor families in urban centers OECD (1999). In many West African countries, women play a significant role in rice production, through which they earn a substantial proportion of their living. For example, the Irrigation Development Authority in Ghana reported that women are engaged in both pre-harvest and post-harvest operations (Lamprey, 2006). The small-scale irrigation project implemented by GIDA (Ghana Irrigation Development Authority) estimates that about 60 percent of rice-farming activities are undertaken by women.

2.10.2 Irrigated Rice production-Ghana

Rice production given the right resources most especially the availability of water and good climatic conditions can be an all year-round activity. In developed countries where rice is produced on a large scale for consumption and export, the production process is irrigated amongst other things to ensure that production targets are met and yields maximized (Nguyen Van Dung *et al*, 2008). These natural fields of irrigated rice lands are called paddies. In Vietnam, where an estimated 4.2million hectare of agricultural land is occupied by rice fields, the irrigated and intensive system of production covers 60% of rice lands with the remainder being grown under rain fed and flood prone ecosystems (Bui Ba Bong, 1999). This has to some extent

culminated in the success story of Vietnam in the production and distribution of rice for local consumption and export around the world.

Literature on the success of rice production in most rice producing countries cite irrigation as a major factor in achieving high yield in production, from South to North America and East Asia (BCI, 2002). Yoshisuke Nakano (2000) for instance, touts irrigation and improved water management amongst other factors; excellent rice varieties, standardized fertilizers, and pest management for ensuring Japan's high and stable productivity of rice. The author stresses further on the effective management of scarce water resources in Japan as a key part of sustaining the irrigated rice production.

The tale of Africa and Ghana to be precise in relation to irrigated rice production is a different one compared to that of the developed and developing countries in the East and West. It is estimated that West Africa alone accounts for 45.8% of total production with 70.4% of cultivated rice areas in the region (Norman & Kebe, 2006). The FAO (2003) also notes in a report that paddy rice production in Africa increased from 16.67 to 19.08 million tons between the year 2000 and 2003. Smallholder farmers being the main contributors in the rice production sector in Africa face a number of hindrances that has made it impossible for the continent to be self-sufficient in its production of rice, leading to the importation of very large quantities of rice into Africa (Khor Martin, 2006). According to Oteng, 1994; Misari, 2002; AAG, 2004; OXFAM, 2005 Cited in Norman & Kebe (2006) the challenges facing rice production in Africa apart from irrigation include: late planting, poor post-harvest handling processing and marketing, extension services, inadequate rural infrastructures, ineffective farmer based organizations/ groups, pest and disease (especially birds). These factors bring about the need for government and institutional interventions in rice production, thus the need to provide some form of credit to boost the sector.

Rice production in Ghana has a very long history dating as far back as two centuries ago. Until the 1920's rice production was limited to the Volta and Western regions with primary activities being carried out by females (Kranjac – Berisavljevic *et al*2003). Various government policies in the 1960-70s promoted local production but the introduction of the Structural Adjustment

Programs in the late 1980's saw the decline in production even though rice consumption increased (Kranjac-Berisavljevic *et al*2003;Defoer&Loosvelt, 2010). Rice production in Ghana is characterized by three main systems: irrigation systems, inland valley systems and upland rice systems. These categories of rice systems were defined by the International Rice Research Institute (IRRI) in 1989 and the West African Development Association (WARDA).The Irrigation Systems is characterized by the building of dams, levees and canals for the irrigation of agricultural plains, an example of this system is the KIP. The Inland Valley system is characterized by rain fed rice production, with soils that have hydromorphic features hence able to retain water; but the nature of the soil and the topography of the land make irrigation systems difficult, but the building of canals and terraces allows water to flow through these fields. The Upland System production activities are dictated mainly by sufficient and continuous rainfall with soil and topography playing a lesser part in production.

Production activities in irrigated rice production in Ghana are characterized by; labor intensive land preparation, the use of high yielding rice seed varieties, mono-cropped and/ intercropped with mainly cereals and tubers when grown in furrows, and the use of agro-chemicals for controlling pest and diseases in improving yield. A research study on the technical efficiency of rice farmers in northern Ghana by Alhassan (2008), describes the activities of rice producers characterized by average farm sizes ranging between 0.2 and 0.6 ha, with 80% of these farms under irrigation and owned usually by men. The study also notes that the farmers relied on accumulated experience rather than extension services with the type agronomic practices observed especially in irrigation. The study concludes that; the technical efficiency of rice producers in the north is influenced to an extent by irrigation even though rice production is threatened severely by other various production risks such as erratic rainfall, crop diseases and pests. The conclusions of this research allows one to make the assumption that, given the adequate amount of resource and *ceteris paribus* rice production can be increased and maximized if there is adequate irrigation of crops.

The Food and Agriculture Organization (FAO) (1995) in a report on Africa's Irrigation Development cites Ghana as having a very high potential for large scale irrigated rice and other cereal production. Given the increased demand for rice in households of Ghana and high rice

importation figures, the provision of adequate infrastructure for irrigation and irrigation development will go a long way in alleviating poverty, food security and providing employment for the countries unemployed youth (Tinsley, 2009; Defoer & Loosvelt, 2010). The potential for irrigated rice production in Inland Valley Swamps (IVS) and river flood plains is about 1.9 million hectares, but not even up to one third of this has been developed for efficient rice production (FAO, 1995). There are twenty-two main public irrigation districts in Ghana managed by the Ghana Irrigation Development Authority (GIDA), and these areas cover an approximately 8,800 ha (JICA, 2007); this figure is a harsh comparison between the stated potential of irrigated rice production in Ghana and does not take into cognizance large scale irrigation projects such as the Aveyime Rice Project. Out of the twenty-two public irrigation districts the main irrigated rice production areas are the Kpong, Tono, Vea and Afife districts, and aside rice production inhabitants of these areas also grow vegetable. The Kpong district is the most developed in terms of land area with 2,786 ha being developed over a period of 10 years and has the potential of providing the areas inhabitants with sustainable livelihoods.

2.10.3 Benefits of Irrigated rice production

The benefits of irrigated rice production are multi-faceted, and it impacts sectors within and outside the agricultural value chain. In most of the irrigated rice farming regions around the world these benefits of rice production have been well reported (Wanet al 2004). Researchers usually cite Vietnam, Indonesia and Thailand as success stories in the use of irrigation for rice production. It has been realized that irrigated and rain fed rice production is profitable. It was competitive and profitable in both seasons (Wan et. al., 2004). Social returns in terms of management and land under irrigated rice production was half of the revenue gained both in the wet and dry seasons. Rice production in irrigated systems had much higher competitiveness and further development in irrigation infrastructure could increase the productivity and competitiveness of rice farming (Wan et. al., 2004). There is cost-benefit ratio before and after the use of irrigation systems for rice production (Jamal et al, 2011).

In Ghana, given the socio economic characteristics of rice farmers', the benefits of irrigated rice farmers can be obtained by observing the socio-economic background of rice farming

households and the credit demand for rice production activities (Quarshie, 2000). Rice farmers in the three northern regions for instance have admitted that the use of irrigation systems have to some extent given them ability to fulfill local rice demands, pay back credit, and fulfill household and social duties with ease (Defoer & Loosvelt, 2010). Presently, the expected outcomes of irrigated agriculture and the provision of other resources cited in various policy manuals and reports highlights the achievement of food security, increased incomes and improved yield geared towards the attainment of self-sufficiency from sustainable rice production; through the use of irrigation systems and provision of credit (USAID, 2008; FAO/MOFA, 2010).

2.10.4. Farmer(s) constraints in Accessing credit

The provision of credit to “poor” smallholder farmers is very essential in ensuring increased production activities amongst smallholder farmers. In Ghana, more than 80% of agricultural production is done on small (atomized) land holdings of less than one hectare and given the socio-economic characteristics of farmers involved in such smallholder activities-the farmers’ access to credit becomes essential in ensuring supply adjustments in the long run (Sarpong, 2004).

2.10.4.1 Farmers Access to Credit

Farmers’ access to credit has been looked at from different perspectives including that of farmers based organizations. A lot has been done to improve farmers access to credit over the past two to three decades by GOG policies and document such as the Financial Sector Adjustment Project (FINSAP) and Food and Agriculture Sector Development Policy (FASDEP I & II) have highlighted these measures towards the improvement of access to credit. The FINSAP for instance, made major strides in turning the tides in terms of the general access to credit in the Ghanaian economy. This was done by the liberalization of the financial sector, the removal of government caps on interest rates amongst other strategies. The FASDEP I & II (GOG policy document on agriculture) also describes government measures towards the improvement of access to credit, both policies address the importance of the private sector, bilateral and multilateral donor institutions in providing farmers with credit. These policy documents further

encourage such institutions in creating portfolios that cater for agricultural production (FASDEP I & II, 2002 & 2009).

2.10.4.2 Constraints to Credit

Despite these strides towards easing the constraints of farmers in accessing credit, there are still a number of challenges faced by farmers' and Farmer Based Organizations (FBO) in accessing credit. According to Wayne (2009), the formation of FBO's for instance to ensure farmers face less constraints in accessing credit have not yielded much results she notes that only a quarter of functional FBO's access credit; which is usually provided by donor interventions. There are two main reasons why FBOS are unable to access credit:

- a. The ineffective sensitization of FBO members – the formation of FBO's in a rush and the lack of unifying purpose.
- b. And the ineffective orientation of FBO's - that is farmers are oriented towards receiving promised credit and after the donors / interveners leave the FBO's are unable to access credit from public sources and thus members decide to leave.

Also farmers have generally not been able to access credit since a number of them do not have adequate collateral, nor meet the stringent conditions attached to credit facilities, banks preferences to give loans to other sectors and not agriculture (as a result of the “high risk” involved) and high transaction cost are a number of institutional factors hindering farmers access to credit (Namara et al, 2011; Ofei, 2003).

2.11 Credit Management

Credit management is the process for controlling and collecting payments from customers. It is the function within a bank or company to control credit policies that will improve revenues and reduce financial risks (www.wikipedia .com, 2013). Credit management is also concerned with making sure those organizations which buy goods and services on credit or individuals who borrow money can afford to do so and that the debts are paid on time. It is best to minimize the likelihood of bad debts through good credit management practices.

Good credit management practices include: preparing your own policies and procedures (e.g. terms and conditions of payment, invoicing promptly and monitoring debts; regular technical training or education of borrowers on credit use and management. Stating the conditions of loans and rates of interests and other costs of loans from alternatives sources ensures that the borrower makes valid comparison (Raeburn, 1984). Frequent technical training has also been linked to high repayment of loans (Iddrisu, 2001). An evaluation research of a credit education scheme revealed when education services are provided to borrowers, it could increase incomes, improve health/nutrition knowledge and practice (Freedom from Hunger, 1998). Training of beneficiaries also empowers and ultimately improves household food security and children's nutritional status. When credit is managed properly, barring any catastrophes beyond the borrower's control, he/she might be equipped with skills to make profitable use of funds received or manage their credit effectively.

2.12. Conclusion

The literature reviewed in this chapter highlighted and described the various components related to irrigated rice production and the impact of credit to production. Irrigated rice production in Ghana is characterized by small-medium scale farmers with inadequate resources such as credit to improve upon production activities. Finding a relation between the credit component of the Kpong Irrigation Project and production proved a daunting task. But literature, related to similar projects highlighted the possible impacts of credit on irrigated rice production and the various constraints faced. The literature also describes the general characteristics of rice farmers and their households. The various literature reviewed serves as a point of comparison or reference to further the researchers' knowledge about access and management of credit by small scale farm holders.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter deals with the study design, study area, target population, sample size, sampling procedure, instrument for data collection, data collection as well as method of data analysis.

3.1. Study design

The study was a cross sectional survey which involved the collection of data at a specific point in time. A subset of the target population was sampled to describe the larger population.

3.2. Study Area

The study was conducted in the Dangbe West District of the Greater Accra Region. The Dangbe West District is situated in the Southeastern part of Ghana, lying between latitude 5° 45' south and 6° 05' North and Longitude 0° 05' East and 0° 20' West. The District has a total land area of 1,442 square kilometers, making it the largest in the Greater Accra Region. The land size represents 41.5% of the regional land area. The district shares boundaries with the Yilo Krobo District on the North-West, North-Tongu District on the North-East, Akwapim-North District on the West, Tema District on the South-West and Dangme-East District on the East. There are 96,809 persons within the district. Out of this, 46,550 (48.2%) are males and 50,259 (51.8%) are females (www.ghanadistricts.com). The average household size of the district as at year 2000 is 5.2 persons (www.ghanadistricts.com, 2013).

The Dangbe West District was selected for this study for a number of reasons. It was selected because of the nearness of the project area to the researcher. Secondly, most farmers of the Kpong Irrigation Project reside in this district. They also do not rely on rain fed agriculture but irrigate their land all year through. The project also has a credit scheme attached to provide credit to farmers. Finally, the researcher has a fair understanding of languages spoken in the project area (Ewe and Dangbe) and so was able to communicate easily with respondents.

3.3. Target Population

The target population of the study was:

- 1) All rice farmers (of both gender) under the Kpong Irrigation Project (KIP)
- 2) Key informants from the Project Management Unit (PMU)
- 3) Key informants from Agricultural Development Bank (ADB)

3.4. Sample size

- 1) Two hundred (200) rice farmers who accessed any form of credit for farming
- 2) Six (6) key informants each from the Project Management Unit and the Agricultural Development Bank.

3.5. Sampling Procedure

3.5.1. Rice Farmers

A number of rice farmers at KIP, have accessed credit from ADB while others have obtained credit from other sources. A list of these farmers was collected from the Project Management Unit of the Kpong Irrigation Project. A rice farmer who had accessed credit from the ADB was contacted and he in turn identified other rice farmers for the researcher. These rice farmers were selected using the snowball method. Snowball sampling is a non-probability sampling method in which persons initially chosen for the sample were used as informants to identify other respondents for the study. Such respondents had the necessary characteristics making them eligible for the sample.

3.5.2. Key informants from Project Management Unit And Agricultural Development Bank

Six (6) key informants each from PMU and ADB were purposively selected. These included the Project Manager, the Operations Manager, Extension Officers and the credit officer of ADB in

Asutsuare. The purposive sampling technique was used because it helped get the opinion of the target population about an issue of interest. It was also very useful for situations where you need to reach a targeted sample quickly and where sampling for proportionality is not the primary concern. The researcher used her personal judgment to select samples that met her criteria. Those selected were individuals in these organizations who were willing and were also knowledgeable about the project and credit packages. Generally they were people who could provide the needed information.

3.6. Instrument for Data Collection

A structured interview guide was used to collect information from all respondents in the study (i.e. rice farmers, staff of PMU and ADB). This data collecting instrument was used because the data collected using this technique provides data that is somewhat more systematic and comprehensive than the informal conversational interview while the order of the interview still remains fairly conversational and informal. It is also useful for reducing bias when several interviewers are involved, when interviewers are less experienced or knowledgeable or when it is important to be able to compare the responses of different respondents. The structured interview was designed to collect information relating to the objectives of the study. (Refer to Appendices 1 & 2).

3.7. Pretest

The interview guide for farmers was pretested on 10 farmers belonging to KIP, who had obtained credit: from various sources for rice production. The process revealed all inconsistencies, wrong expressions and inappropriate words in the prepared instrument and the necessary corrections were made. The interview guide for key informants was pretested on two (2) extension officers of the project management unit of the KIP. They did not form part of the final respondents studied.

3.8. Data Collection

Farmers

Four research assistants were trained to help with data collection. These research assistants were given prior training to ensure that they understood the items in the data collection instrument. With the help of extension officers of the PMU, the sampled farmers' residences were located. The reason for the study was explained to them and based on their willingness to be interviewed, interview dates were scheduled. Data collection lasted for a period of five (5) months, (from May to September 2012). The researcher collected data with the help of four research assistants.

Key Informants – PMU & ADB

In depth interviews with key informants was conducted on the premises of PMU and ADB by the researcher. The reason for the study was explained to all workers and interviews were conducted with those who were willing to participate.

3.9. Data Analysis

Data was hand coded and analyzed using the Statistical Package for Social Sciences (SPSS) software (version 18). Chi-square tests were used to determine the relationship between variables in the study. The presentation was mainly descriptive using frequency distribution tables, percentages, means, modes and graphs where appropriate.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 INTRODUCTION

This chapter presents the findings of the research. The results are presented using frequency tables, charts and diagrams. This chapter has two main sections; the first section is an overview of the Kpong Irrigation Project. The second section consists of demographic and farm information, sources of credit, credit packages available to farmers, reasons for accessing loans, benefits of accessing credit, challenges in accessing credit and credit management.

4.1 OVERVIEW OF THE KPONG IRRIGATION PROJECT (KIP)

In order to access the views of credit providers, information was sought in the form of interviews from six (6) key informants. These include the Project Manager of KIP, the Operations Manager of KIP, three extension officers as well as the credit officer of the Credit Component of the project (ADB). In addition to that, information was sought from secondary sources. This section presents an overview of the KIP from key informants and secondary sources. Its essence is to help understand better the information that rice farmers at Kpong gave about access and management of their credit.

Kpong Irrigation Project where the research was conducted is located about 80 km (38 miles) from Accra on the main Accra-Kpong road, opposite the junction to Asutsuare. It is on the watershed, which divides the Accra plains into two (2) parts: the coastal and Volta catchment areas (ADF, 2005). The typical climate of the area is that of Northern Accra plains with a bimodal rainfall pattern totaling 1016 -1270 mm a year. Around Akuse, a major town, rainfall ranges from 625 mm to 1961 mm a year with a wind speed of 40km/hr. Mean temperature is highest in February and March (Intermediate between Forest – 1372 mm; and Northern Savanna – 1981 mm). The KIP is one of the twenty two existing, planned or under construction public irrigation projects scattered across Ghana, owned by Government of Ghana (GOG) and operated

and maintained by Ghana Irrigation Development Authority (GIDA) (Namara et al, 2011; Tinsley, 2009).

The Kpong Irrigation Scheme is a 3000 hectare (ha) project. It was constructed with funding from African Development Bank (AfDB), Technical Assistance Fund (TAF), Arab Bank for Economic Development (BADEA) and Government of Ghana (GOG), with AfDB being the major contributor. It derives water from the Volta River via the Kpong Reservoir which is a relatively low head hydroelectric generation and storage facility (Tinsley, 2002). The land for the irrigation project is officially allocated to the farmer beneficiaries in one hectare allocations. These beneficiaries are obliged to be members of the farmers' cooperative that is mostly involved in managing credit through the local branch of the Agriculture Development Bank. The preliminary appraisal of KIP began in 1989 but the project was approved in February 1990 and became effective in March 1994. Project activities and disbursement of loan resources were facilitated that same year. The goal of the project was to support Ghana's Economic Recovery Program (ERP) by contributing to the achievement of food security, self-sufficiency and improved living standards of small holder rice farmers. Specific targets were to increase yields from 3 tons/ha to 5 tons/ha.

The Kpong Irrigation Project performs the following activities:

- a) Provides gravity irrigation water supplies from the existing Kpong reservoir for cultivation of paddy rice by small holder farmers.
- b) Rehabilitated 1,955ha of irrigation land and further developed 1,073ha of gravity irrigation for perennial rice production.
- c) Initiates rational farmer participation in project management and progressive privatization of agricultural services.
- d) Provides credit facilities to farmers in order to remove production constraints.
- e) Rehabilitates existing buildings and infrastructure and
- f) Provides social amenities including potable water supplies, rural electrification as well as education and health facilities (Tinsley, 2009).

There are seven components of KIP and these are: land development, buildings and infrastructure, vehicles and equipment, institutional support and training, construction supervision, credit and recruitment costs (ADF Report, 2005). A few of these components would be discussed in this section. These include: land development, building and infrastructure and the credit component (Tinsley, 2009).

Land development:

Under the Land Development component, 76% of the total ADF loan was used in land development and rehabilitation which included the building of canals, installation of lift pumps, motors, and electrical works, high level canal and 500metres high pressure pipeline. The completion of this part of the project saw the allocation of land to beneficiary farmers in cooperatives (ADF, 2005).

Building & infrastructure:

The building and infrastructure component was co-financed by BADEA and GOG (USD 3.21 and 1.33 million). This amount was used in construction and rehabilitation of staff quarters, warehouses, clinics, workshops and stores. There was electrification of villages and towns as well as the provision of other social amenities (ADF, 2005).

Credit component:

The credit component comprises the provision of a revolving seasonal credit system for the supply in kind of farm inputs and medium term credit for farm tools and equipment. The credit provided to farmers is in the form of supervised production credit. Agro inputs like fertilizers, weedicides and seed rice are provided by service providers and paid for. Farmers also use irrigation services which are paid for through the loans. The credit component also covers land preparation, transplanting, harvesting and threshing activities(ADF, 2005). Farmers are allowed to deposit 60% of their produce as repayment for the credit in stores provided by GIDA (KIP Project Implementation Report,2005).

4.1.1 Credit Services Provided By KIP

According to the key informants, the Kpong Irrigation Project (KIP) has attached to it an agency of the Agricultural Development Bank to provide credit for farmers under the project. The ADB in consultation with the KIP offers agricultural loans to farmers under the project at 26 percent per annum. Key informants indicated that some of the services they provide to farmers include: irrigation water and extension services, machine hiring for land development, machine hiring for land irrigation, Irrigation water service and maintenance of road. They also provide seed rice, loans for transplanting, fertilizer, farm inputs, handpicking harvesting, ware housing service and general extension services. All these services are meant to assist farmers increase yield, sustain the irrigation project, improve the farmers' standard of living and increase the production of rice in the country.

Significant findings from these credit providers were the fact that, they have put in place strategies to ensure that clients who borrow their money utilize the credit efficiently. Some of these strategies include: giving training on the use of loans, ensuring that farmers invest some amount of money and time already in their farm before the loans is disbursed, visiting the farm on regular bases to ensure: farm activities are in progress, farmers abide by the rules and regulations in accessing loans and that farmers are part of a cooperative and so check on one another.

The credit provided is supervised production credit thus acting as a check on farmers. These services have led to increase in yield and enabled most of the farmers expand their farms and make more profit after harvest. The KIP has been providing these services for the past nineteen (19) years. The aim of providing these services is to contribute to the achievement of food security and improved living standards of small holder rice farmers through the provision of credit.

Loans are given at every stage of the farming process when they are needed (for land preparation, transplanting, handpicking, harvesting and for threshing). Agro inputs like fertilizers are also supplied by service providers and paid for. The minimum amount given out is 250GH¢ and the maximum amount given out was 300GH¢ per hectare. Borrowers take the loans and pay as soon as they have harvested their produce. It usually takes thirty (30) to forty- five (45) days

after applying to access the loan. According to key informants the loans given out are adequate because a budget is made by the KIP each year and based on that loans are made out to farmers.

Key informants explained that there are certain requirements farmers need to fulfill in order to have access to loans under the ADB/KIP. The farmers must have the following requirements: be a registered member of the Osudoku Farmer's cooperative, have land (developed irrigable land leased by the KIP), have access to water, cultivate rice, have farm land which is at least one hectare. The loan application is made through the leadership of the Osudoku Farmer's Cooperative.

From the result of the interviews conducted with key informants, they indicated certain farmers also took credit from informal sources such as friends, relatives, traders and money lenders. Prompt loan releases was an important consideration in getting loans from informal sources and was a reason why farmers borrow from informal lenders. Credit from informal sources was either in kind or cash. The credit in kind included the provision of seed rice, fertilizers while cash was paid for labour, hand picking, harvesting threshing as well as irrigation services. Key informants indicated rice farmers occasionally got loans or credit from these informal sources if they: did not meet the KIP/ADB requirements for accessing loans, defaulted on loans taken in previous years, wanted immediately to access easy cash of any amount at any time, which they could not get from the formal credit providers.

The key informants further indicated that farmers' access to credit was limited by the available credit services in their area. Thus farmers may access credit packages available, which may not necessarily be their preference.

4.1.1.1. Benefits of KIP Credit from Key informants point of view

Credit is an important element in agricultural production system which allows the farmers to satisfy their cash needs for farm production activities such as land preparation, planting and cultivation. Key informants indicated that the availability of credit plays an important role in allowing rural households purchase inputs; adopt modern technologies and makes income available for use in the short term. The implication of credit availability allows for both greater

consumption and greater purchase of production input, thus increasing family income in the short term to meet not only farming needs but also family needs and to help improve the welfare of the farmers.

The ADF Report (2005) confirmed the benefits of the credit facility to rice farmers. It showed availability of the credit resulted in higher yield, higher annual production and increase in hectares of lands cultivated. The yield of the main season increased from an annual average of 3-5ton/ha to a range of 4-5/ha. As at 2009, the rice yield had increased to 6-7tons/ha (Tinsley, 2009). These increases were made possible as a result of interventions made during the project implementation phase such as the use of high yielding rice varieties, good seed material, improved irrigation methods, improved husbandry, the use of fertilizers, and better weed and pest control (ADF, 2005).

The KIP project also had social and environmental benefits (ADF, 2005). The social impacts of the project include: the legalization of illegally owned lands by farmers facilitated by KIP for the sake of peace, the reallocation of displaced farmers, development and rehabilitation of social amenities and the inclusion of women and youth in the allocation of land and other activities. Also the KIP resulted in smallholder farmers increasing their incomes from a total of \$63 before project implementation to a total of \$430 at completion. The report subsequently noted that there has been substantial improvement in the projects community living standards.

4.1.1.2. Challenges/Constraints with the entire KIP Project

The provision of credit to “poor” smallholder farmers is very essential in ensuring increased production activities amongst smallholder farmers but then key informants and the ADF Report (2005) indicated rice farmers and Farmer Based Organizations (FBO) generally experience certain constraints in accessing credit. There are two main reasons why FBOS are unable to access credit. These are:

- a. The ineffective sensitization of FBO members – the formation of FBO’s was in a rush and there was lack of unifying purpose.

- b. The ineffective orientation of FBO's--- that is farmers are oriented towards receiving promised credit and after the donors / interveners leave the FBO's are unable to access credit from public sources and thus members decide to leave.

They further indicated that most farmers do not meet their basic requirements for accessing loans (e.g. the ineligibility of other farmers in the catchment area for loans since they were not in the initial project implementation phase nor owned land title deeds. A number of them did not have adequate collateral, nor met the stringent conditions attached to credit facilities. The high interest or substitution rate (when farmers are made to substitute a percentage of their produce to gain access to credit) is another constraint. They confirmed their bank also showed preference in giving loans to other sectors and not agriculture as a result of the “high risk” involved, high transaction and a number of other institutional factors. Institutional factors identified by the key informants included: attitude of bank officials, the cumbersome process of acquiring loans, being asked to join an association before getting the loans, not expecting to get the loan and finally friends were trying but not getting loans. These constraints were also realized in literature as hindering farmers' access to credit (Namara et al, 2011; Ofei, 2003). Tinsley (2009) noted that in terms of productivity of the KIP, the credit component of the project is only serving 10% of the beneficiaries in the catchment area, meaning 90% of the possible beneficiaries were self financing their rice production and argues that using these indicators the program is not truly successful.

The entire implementation schedule of the KIP faced a number of challenges, some of which include: delays in loan disbursements and untimely releases and inadequacy of GOG contributions (ADF, 2005). This resulted in delays in the project implementation. Other problems included inappropriate project management arrangements. Even at the time of final disbursement and completion of project activities in 2003, substantial portions of project activities were not completed. For instance, the BADEA funded buildings and infrastructure component and the procurement of agricultural machinery and vehicles were still not concluded at the time the ADF report was submitted (ADF, 2005). Other challenges include the environmental impact of the project. There has been pollution of drainage water as a result of the use of agrochemicals, human exposure to pesticides and dust, and the salinization of soil.

4.2 Demographic Characteristics of Rice farmers

This section presents information on the demographic and socio-economic characteristics of rice farmers who were part of the study sample. It includes information about their age, gender, educational status, household information, ethnic group, religion, farming experience, farm size, among others.

4.2.1 Age and gender of the respondents

From Table 4.1 it can be deduced that majority of rice farmers were males while 42.5% were females. Sexual division of labour is predominant in Ghana and farming is generally perceived as a male oriented occupation. According to Alhassan (2008) about 80% of irrigated land is controlled by men. At the KIP however there have been efforts by management to correct this situation. The relatively high number of females in the project is due to the social inclusion and gender mainstreaming effort by management of KIP (ADF, 2005).

Table 4.1: Age and gender distribution of respondents

Age	Gender					
	Male		Female		Total	
	Frequency	%	Frequency	%	Frequency	%
Less than 35	20	17	10	12	30	15
35 – 49	47	41	45	53	93	46
50 and above	48	42	30	35	78	39
Total	115	100	85	100	200	100

The age of the respondents' ranged between 25 years to 69 years with a mean age of 47. From Table 4.1, it can be noticed that, majority of both male and female rice farmers were between 35 to 49 years with 41% representing male farmers and 53% being female farmers. Literature indicates the age of borrowers influences the use of credit thus there is the likelihood that respondents age would influence how effectively they use credit (Siameh, 2003).

4.2.2 Marital Status of the respondents

From Table 4.2, 71% of rice farmers were married. Marriage imposes strains and responsibilities. This means that majority of rice farmers included in the study have responsibilities and that could influence their use of loans.

Table 4.2: Marital Status of the respondents

Marital Status	Frequency(n=200)	Percent (%)
Married	143	71
Widowed	22	11
Single	14	7
Divorced	12	6
Separated	7	4
Others (Cohabitation)	2	1

4.2.3 Number of children of the respondents

From Table 4.3, thirty two percent (32%) of rice farmers had between 1 and 3 children whilst thirty one percent also had between 4 and 6 children. These children depend on their parents for a living and therefore the higher the number of children, the higher the amount of money needed to attend to basic family needs of family members. Thus if such families do not manage credit effectively, they could end up having problems.

Table 4.3: Number of children of the respondents

Number of children	Frequency(n=200)	Percent (%)
1 – 3 children	64	32
4 – 6 children	62	31
7 – 10 children	40	20
None	34	17

4.2.4 Dependency on household head of the respondents

Sixty seven percent (67%) of respondents had between 1-5 people depending on them. These respondents had a responsibility to attend to the needs of their dependents. The number of dependents therefore can have an effect on their effective use of credit.

Table 4.4: Dependency on household head of the respondents

Dependency on household head	Frequency(n=200)	Percent (%)
1 – 5 people	134	67
6 – 10 people	19	10
11 and above	47	23

4.2.5 Ethnic group of the respondents

From Table 4.5, 43% of rice farmers are from the Dangme ethnic group, followed by Ewes (30%). This high number is because the Irrigation Project is located within an area with a lot of Dangmes and Ewes.

Table 4.5: Ethnic group of the respondents

Ethnic group	Frequency(n=200)	Percent (%)
Dangme	86	43
Ewe	60	30
Ga	46	23
Akan	4	2
Other tribes (Dagomba, Kasem)	4	2

4.2.6 Educational level of the respondents

Majority, which is 62% of rice farmers have only basic education. The level of education of respondents tends to affect their level of understanding of documents so respondents with lower level of education indicated they shy away from filling forms. The education level of farmers would also affect their use of inputs like application of fertilizer and other agro inputs like weedicides but respondents explained that extension officers were on hand to help them use the right quantity of inputs to increase yields.

Table 4.6: Educational level of the respondents

Educational Level	Frequency(n=200)	Percent (%)
No Education	28	14
Basic Education (Primary/ JHS)	123	62
Secondary Education (SHS)	28	14
Tertiary (University/ Teacher training)	20	10

Due to the small holding of small holder farmers coupled with their high dependency ratio they are generally poor. This poverty situation limits their capacity to access production inputs especially credit. Access to finance however is limited to few people and is particularly a problem to small holder farmers and more so with women than men.

4.2.7 Annual household Income

Income is an important resource that individuals and families use in order to meet their goals. The family depends on this income for providing needs such as food, clothing, shelter and leisure.

Table 4.7 Annual household Income

Income Range (GH¢)	Frequency	Percentage
Less than 1000	13	6.0
1000 to 3000	73	37.0
3001 to 5000	53	26.0
5001 to 10000	33	17.0
Above 10000	28	14.0
Total	200	100.0

The income ranged from 900Gh¢ to above 10000Gh¢ with their average income being 5450Gh¢. This income was from both agricultural and non-agricultural sources. From this average, the monthly income of respondents was 479Gh¢. From Table 4.4, 67% of respondents had between 1 and 5 people dependent on the household head. The amount of 479Gh¢ was therefore not enough to cater for the basic needs of a family of six. These needs include food, rent, school fees,

clothing, electricity and water bills, as well as health bills. Tinsley (2004) also reported that small scale farmers are not able to produce enough to get adequate income, and that their incomes are spent on basic essentials like food and clothes.

These support findings by Heidhues and Schrieder (1999) that low per capita income results in low savings rate which in turn results in low productivity and therefore low investment rate. Because the annual income is low and cannot meet the needs, respondents cannot save and therefore the vicious cycle of low capital formation continues. This is why farmers in the study supplement their incomes from rice farming by growing other crops like cassava, maize and plantain for household consumption in addition to getting credit every time for their farming activities.

4.2.8 Source of income

Respondents' income was from both agricultural sources and non- agricultural sources.

Table 4.8: Sources of income

Sources of farm income	Frequency (n=200)	Percentages
Rice	200	100
Other crops	82	41
Labour for post harvest activities	32	16
Farm labour	8	4
Livestock	6	3

Total percentage > 100 due to multiple responses

When the proportion of income from various agricultural sources were examined, it was discovered that, though farmers made some form of revenue from activities such as livestock rearing (3%), farm labour (4%) and rental services for post-harvest activities (16%), majority of them got their revenue from crop cultivation (41%) and rice farming (100%). Other crops grown are presented in Table 4.11. This is a clear indication that, rice production is the major source of income for the study sample. Findings by FAO (2008) also indicate that rice production is a major source of employment, income generation and nutrition in many poor food unsecured

countries. The numerous activities provide employment to millions of people who work directly in rice production or in related support services like harvesting, threshing, drying, milling, storage and trade. Through incomes generated from these sources household heads are able to cater for the need of their dependents.

4.2.9 Non Agricultural/Non-farm income

Respondents' non-agricultural income was from a variety of sources. This is presented in the table below.

Table 4.9: Non Agricultural/Non-farm income

Sources of non-agricultural farm income	Frequency	Percent
Small scale business	88	44.0
Private employee	56	28.0
Remittances from abroad	28	14.0
Public servant/government employee	28	14.0
Total	200	100.0

Findings in Table 4.8 and 4.9 show rice farmers have varied sources of income to improve their standard of living. The study showed that respondents were also involved in other non-agricultural activities to supplement their income. Majority of them were involved in small scale businesses (44%) and as private employees for other companies (28%) as shown in Table 4.9. Only a few (15%) had remittances from abroad as another source of revenue. This is a confirmation of Wright (2001) who observed that rural households do not have one source of income, rather they pursue a mix of activities that may include growing their own food, labouring for others, running small production or trading business.

4.3 Enterprise Characteristics of Rice Farmers

In order to address one of the objectives of this study which is to find out how rice farmers access and manage credit, one will first need information about the enterprise characteristics of

rice farming. This would help explain why rice farmers' access credit. It also gives information about inputs needed on rice farms. This information is presented in this section.

4.3.1 Land acquisition for rice farming

Respondents acquire land from a variety of sources. This data is presented in Table 4.10 below.

Table 4.10: Land acquisition for rice farming

Type of acquisition	Frequency	Percentage
Lease	77	39
Hiring/ renting	59	30
Family	26	13
Outright purchase	25	13
Share tenant	13	7
Total	200	100

Thirty-nine (39%) of the respondents said they acquired their land through lease while 30% hired or rented the land. This is because a majority of irrigated land is owned by the Ghana Irrigation Development Authority (GIDA). GIDA leases the land out to interested inhabitants of the areas concerned on short terms basis (Amoatin and Acheampong 1997). A lot of negotiations go into all these forms of land acquisition: these negotiations affect the cost of production and hence the profits of farmers at the end of the harvesting period. Information gathered also reveals that, in some cases where lands are hired from families and land owners, a proportion of the annual harvest is reserved for the land owner. This therefore means that, a rice farmer without access to land will only work for a portion of the harvest and this will in the long term have an impact on how much income the farmer makes as well as how much he can save and also re-invest into his rice production. For such farmers the provision of basic needs for members of his/her family then becomes a problem. Thus they remain in the vicious cycle of poverty and continue to apply for credit year in and year out for their farming activities.

4.3.2 Major Cultivated Crops

Data presented in Table 4.11, also revealed that, the study sample cultivated other crops in addition to rice.

Table 4.11: Crops Cultivated by Farmer Respondents'

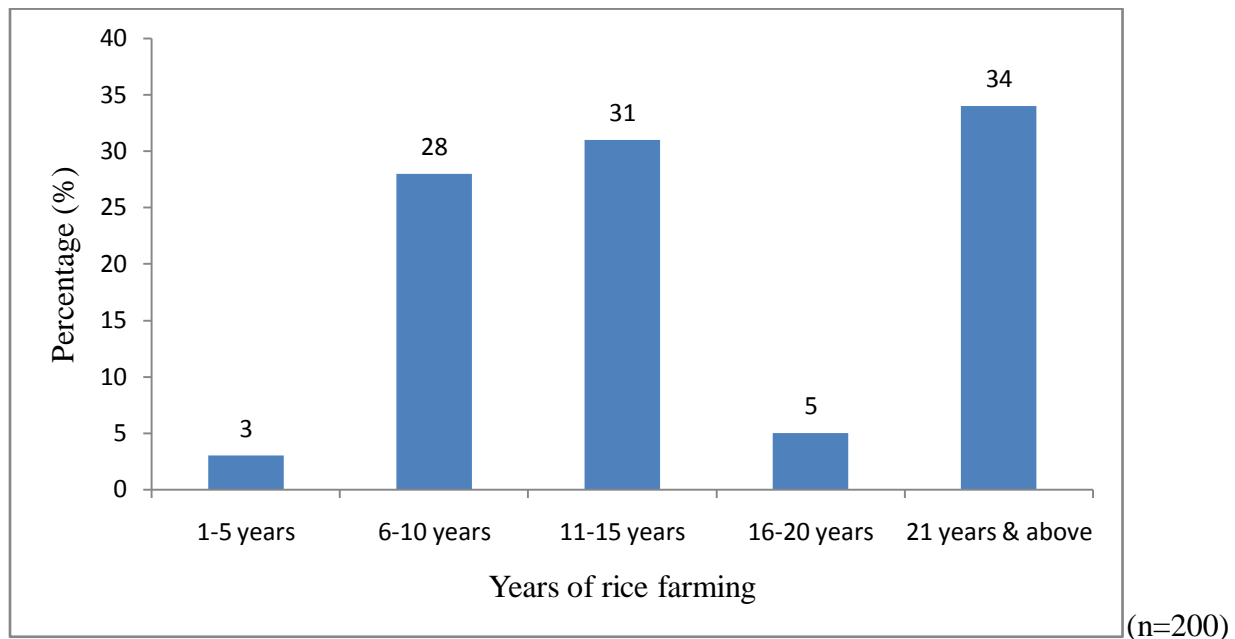
Crops cultivated	Frequency (n=200)	Percentage (%)
Rice	200	100
Maize	22	11
Cassava	19	10
Plantain	17	9
Pepper	15	8
Okro	6	3
Cowpea	3	2

Total responses > 100 due to multiple responses

All respondents cultivate rice while a portion of farmers cultivate other crops such as cassava, plantain, okro, pepper, maize which are mostly for their own consumption. This confirms literature that irrigated rice is usually intercropped. The cultivation of these crops is meant to supplement rice incomes (Amoatin and Acheampong 1997), as well as provide food for households and therefore money which was to be used in purchasing food for household use was diverted to other equally pressing needs like payment of school fees, clothing needs, electricity and water bills as well as health needs.

4.3.3 Farming experience

It is assumed that, the number of years in farming impacted on their understanding of the farming processes, knowledge of the sources of credit facilities and their understanding of expected challenges in the farming business. Thus respondents were asked how long they had spent in farming.

Figure 4.1: Farming experience

Respondents' years of rice farming ranged from 3-21 years with most of them (70%) having 11 years or more rice farming experience. Alhassan (2008) noted that farmers relied on accumulated experience rather than extension services in terms of agronomic practices observed in irrigation. This affected their rice yield. Another issue that came up was that the KIP was established to support Ghana's Economic Recovery Program (ERP) by contributing to food security, self-sufficiency and improving standard of living of small holder rice farmers (Tinsley, 2009). But then these farmers have been farming for the past 11 years plus and are supposed to be self-sufficient but they still go in for loans during the farming season.

4.3.4 Size of the rice farm

Findings in Table 4.12 show the size of respondents' rice farms in hectares.

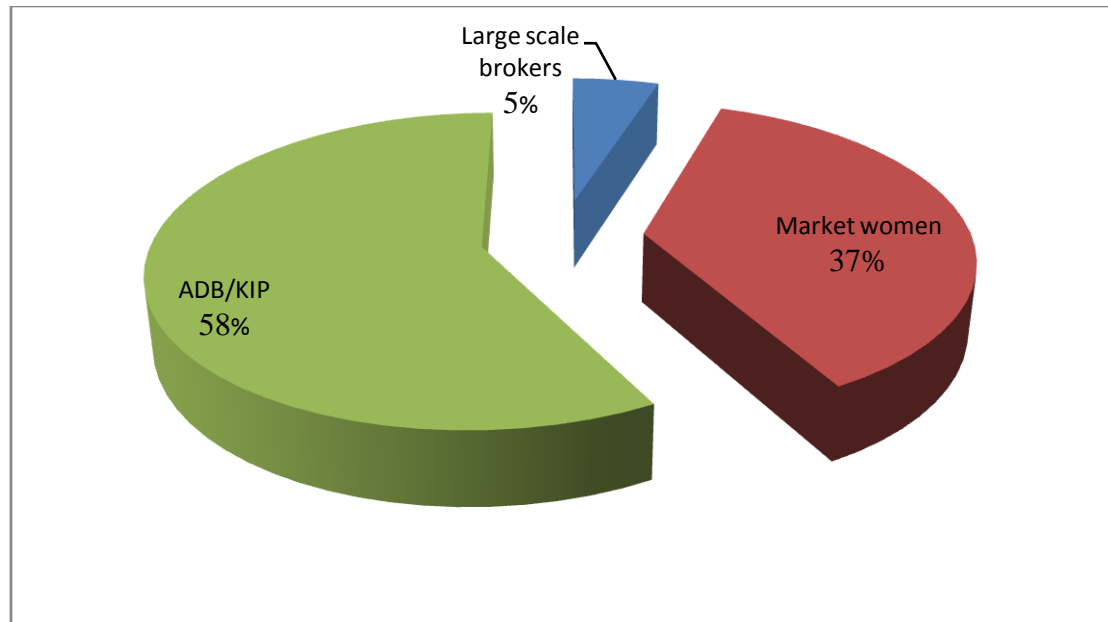
Table 4.12: Size of the rice farm (hectares)

Land size (hectares)	Frequency	Percentage
Less than a hectare	81	40.5
1 – 5	107	53.5
6 – 10	7	3.5
11 to 15	1	.5
16 to 20	2	1.0
21 and above	2	1.0
Total	200	100.0

A significant finding from the data presented in Table 4.13 was that almost 40% of respondents had farm sizes less than a hectare implying most of them had small tracts of farming land. These farmers indicated they tend to work with limited resources, are entrapped in the vicious cycle of poverty and are unable to produce enough to get adequate income. They are therefore driven by financial pressure every farming season to source for credit facilities. This was also realized by Sarpong (2004), who indicated access to credit was essential for small holder farming activities. There is also pressure on them to sell their produce early (that is during the bumper season) when they do not make as much profit as they would if their produce is sold in the lean season. Due to this, most of such farmers indicated they found it difficult to meet family needs.

4.3.5 People who purchase rice

Data in Figure 4.2 reveals most of the farmers sell their rice to creditors (that is ADB/KIP) large scale brokers and market women.

Figure 4.2: People who purchase rice**(n=200)**

These creditors provide the farmers with credit facilities. The term and conditions of such credit facilities requires that payment is done in kind with part of the rice yield. (KIP project implementation report). So contrary to Morss et al (1975) who indicated provision of credit to small farmers help eliminate the well-established custom of selling the first part of the harvest to local intermediaries who purchase at lower than competitive prices in return for cash advances. These rice farmers rather found themselves being entrapped in this vicious cycle. This situation was also confirmed by Tinsley (2004) who further indicated this causes the farmers to sell their produce early instead of storing them till the cost of rice increases. These farmers thus constantly keep themselves in the vicious cycle of poverty and are unable to adequately meet family needs.

4.4 Access to Credit

This section presents information about credit packages available to rice farmers in KIP, reasons why they access credit, as well as the benefits and problems of respondents associated with accessing credit.

4.4.1 Sources of credit

Findings in Table 4.13 show rice farmers accessed credit from a variety of sources.

Table 4.13: Sources of Credit

Sources of credit	Frequency	Percentage
Bank (formal)	132	66.0
Traders (informal)	34	17.0
Money lenders (semi formal)	17	8.5
Relatives (informal)	9	4.5
Friends (informal)	8	4.0
Total	200	100.0

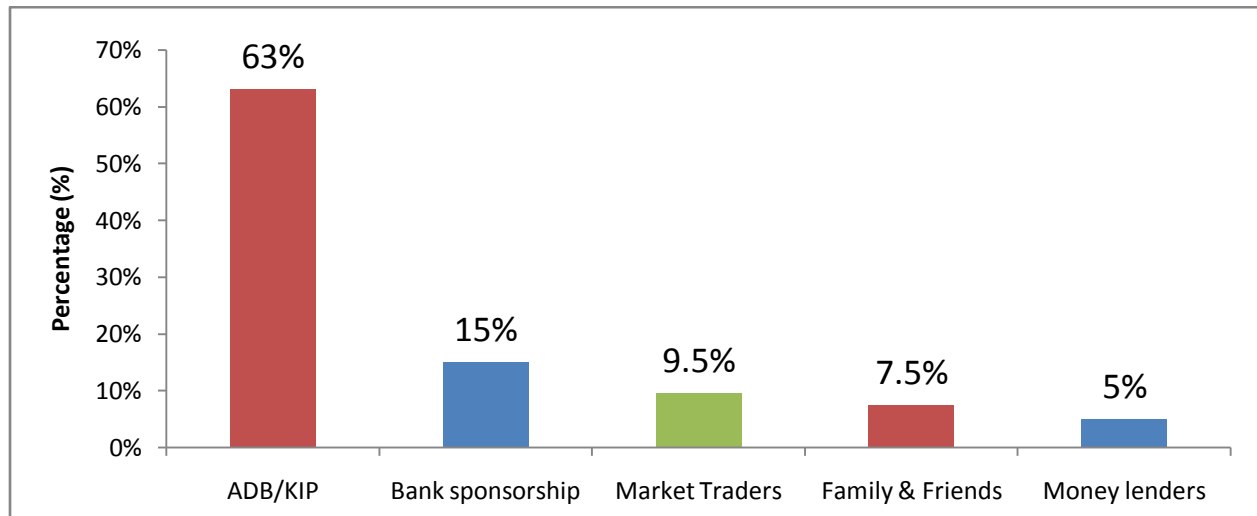
Rice farmers accessed credit from a variety of formal, semi-formal and informal sources with their main source being the formal source (that is Bank). This was done in order to improve the standard of living of families and to provide for the basic needs of their families. This affirms literature that rice farmers access different sources of credit for their farming activities in order to realize improvement in their lives (Littlefield et al, 2003). The finding is contrary to findings by Miracle and Cohen (1980) that indicates formal financial institutions are not popular in most rural communities due to the cumbersome savings and lending procedure and Tolentino (1988), Santos and Guce (2001) who realized two thirds of farmers borrow from informal lenders. But then all the study sample belongs to the KIP which is a formal lending institution thus it is not surprising that majority had the Banks as their main source of credit whether in cash or kind.

Farmers who took credit from informal sources explained it was done because these institutions operate without requesting for physical collateral, involved small loans and short term transactions, was based on mutual trust and non-material collateral example character and reputation.

4.4.2 Preferred source of credit

The researcher further investigated the preferred source of credit of rice farmers and 63% of the study sample indicated they preferred ADB/KIP while the least preferred source was from money lenders (5%)

Figure 4.3: Preferred Source of credit



The reasons why respondents preferred these sources of credit are explained below:

KIP/ADB Management:

Respondents preferred KIP/ADB because accessing loans from them was reliable and the interest rate moderate. They indicated it was also a sure way of meeting ones' budget, getting farm inputs and the fact that ADB/KIP takes no collateral, just like with other informal sources of credit. Other reasons given were personal relationship between management and farmers.

It is worth mentioning that although ABD/KIP were formal institutions, they had certain characteristics of informal financial institutions (example, lending without collateral, having personal relationship among others). This made them attractive credit sources for these rice farmers.

Bank sponsorship:

Respondents who preferred other banks apart from the ADB believe these banks are also reliable and it is easier to contact them for loans than the KIP/ADB.

Family & Friends:

The 7.5% who preferred family and friends said they did not have to provide collateral or sign any document to get a loan from a friend or relative.

Market Traders:

Rice farmers who preferred market traders said they buy all their rice, pay the difference and it was also easy to get all the credit one needed in time, without signing papers. Another reason given by farmers for choosing market traders was the personal relationship and trust that existed between borrowers and lenders.

Money Lenders:

Money lenders because they are readily available to give farmers the credit and farmers do not have to fill forms and go for several meetings before the loan facility is given.

All these findings suggest even though majority of respondents (78%) preferred borrowing from the formal sector, minority preferred the informal sector because it was easier and quick to access credit either in cash or kind without having collateral and also because they had a personal relationship with the lenders. These findings conform to what was realized by Jackelen & Rhyne (1991) that informal institutions seem to be doing well due to the following reasons: their proximity to their clients, easy access at anytime, quick processing in which collateral is not obligatory, repayment flexibility, lower transaction cost for borrowers and savers.

4.4.3 Source of information about credit

The awareness of credit sources is relatively important to be able to access credit in a community. The source of rice farmers' information about credit is presented in Table 4.14

Table 4.14: Source of information about credit

Sources	Frequency (n=200)	Percentage %
Friends	97	49
Mass Media	69	34.5
Money Lenders	14	7.0
Relatives	13	6.5
Traders	7	3.5

The source of rice farmers' information about credit is presented in Table 4.14. It was realized that the main source of information about credit was from friends (49%) while the least source was from traders (3.5%). This is an indication that word of mouth was an effective communication tool for the spread of information about credit packages. Through word of mouth, clients got information about various available credit packages within and outside the KIP.

4.4.4 Credit packages available for farmers from KIP

Credit packages available to farmers were either in kind or cash.

Table 4.15: Credit packages available for farmers from KIP

Package types	Available Packages
Cash	<ul style="list-style-type: none"> • Minimum amount Gh¢ 250 / Ha/yr • Maximum amount Gh¢ 300/Ha/yr
Kind	<ul style="list-style-type: none"> • Rice seeds provision • Transplanting services • Fertilizer services • Farm Input service • Handpicking service • Harvesting service • Irrigation service • Extension service • Threshing

Table 4.15 presents information about the available credit packages available to rice farmers.

The packages are shown in Table 4.15 in cash or kind. The rice farmers indicated on average they were able to access credit in cash ranging from GH¢100 – GH¢8000. These credit packages in kind were advanced for acquisition of factors of production as was realized by Acheampong (1986). This form of credit in kind is referred to as input credit or inventory credit (Acheampong, 1986).

These credit packages are available to contribute to food security, self-sufficiency and help improve the living standards of small holder rice farmers (Tinsley, 2009). These farmers need to

be made aware of them so that they can access these facilities to help improve on their farming activities.

4.4.5 Requirement for accessing credit from KIP

Every financial organization has its own terms and condition for accessing credit facilities. The rice farmers indicated requirements for accessing credit from KIP. These are presented in Table 4.16.

Table 4.16: Requirement for accessing credit from KIP

Requirement	Frequency	Percent%
Cultivating rice	200	100
Access to water	200	100
Be a registered farmer	132	66
Group formation	132	66
Credit worthy and in good standing	80	40
Have a farming land	44	22
Selling all farm produce to traders	34	17
10% of loans kept as insurance	30	15
Savings required	30	15
Collateral requirement	16	8

Total responses > 100 % due to multiple responses

An analysis of these responses suggests respondents were aware of all the requirements for accessing KIP as was indicated by key informants in Section 4.1.

The findings show that collateral requirements which are the main condition for accessing credit in formal institutions (Miracle and Cohen, 1980) were the least requirement for accessing credit from KIP. Key informants and management of KIP realized from experience and literature that clients were reluctant to access formal credit because of the numerous formalities, requirements and cumbersome delays (Miracle and Cohen, 1980; Nsiah Gyabaah and Edusah, 1995). Thus they stressed more on group formation and other terms and conditions with collateral being the least condition. Pre-supposing KIP was run more as a semiformal financial institution than a

formal one. Group formation was a major requirement, this according to Poliquit (2006) is because a group of small farmers which is legally constituted as a co-operative society can borrow on better terms, can shoulder some of the cost of loan administration and offer better security than individuals who borrow on their own account. From the results of this study, it was noticed that, there has been the introduction of new systems to cater for these pre-requisites for accessing loans. Some of these new strategies include ensuring that farmers are in groups and ensuring the farmers have invested on the land to a certain extent. These approaches and others such as monitoring the farming activities and training farmers before and after the loans, creates opportunity for those without any collateral to access loans.

4.4.6 Factors determining source of credit and terms of payment

Farmers indicated various factors were considered when choosing a credit source. These they indicated were: the terms of payment, reliability, interest rates, timeliness and convenience, and actual content of credit packages. Others preferred credit in kind since this prevents them from using cash loans for other purposes. The information pre-supposes there is a need for a more stream lined procedure to be laid down by creditors or financial institutions to ensure loan acquisition and repayment. They however preferred selling their entire yield themselves and then paying their credit rather than paying with the paddy rice.

4.4.7 Interest Rates

All lenders with the exception of friends charge some form of interest on loans given out. Interest rates charged by different lenders are provided in the table below.

Table 4.17: Interest Rates

Preferred source	Interest Rate per annum	Rating
Money lenders	40%	High
Bank sponsorship	30%	Moderate
KIP management/ ADB	26%	Moderate
Market Traders	Varies
Family & Friends	None

From Table 4.17, money lenders charge the highest rate of interest (40%) followed by other banks (30%). Family and friends did not charge any interest on loans given out. Johnson and Rogaly (1997) noted that to the lender, interest is what he will use to pay for the cost of funds, cost of providing loans and cost of default. Therefore lenders prefer higher interest whereas borrowers prefer low interest rates. But Robinson (2001) also argues that provision of interest rates below those in the formal sector has in the past resulted in the failure of many development finance institutions from reaching their target group. Interest rates should therefore be set with the aim, of providing viable long term financial services to people who need it especially for their production activities and to meet family needs. These rates should cover administrative cost, loan losses and provide for increasing equity.

4.5 Reasons for Accessing Loans

Another major objective of the study was to determine some of the reasons why these farmers access loan. These reasons are presented in Table 4.18.

Table 4.18: Reasons for accessing loans

Uses of loans	Frequency	Percentage %
Labour(Harvesting/threshing)	145	73
Agro chemical(weedicides)	143	72
Fertilizer	134	67
Land preparation	99	49
Seed rice	98	49
Non-farm activities	38	19

From Table 4.18, it can be deduced that most rice farmers used their loans mainly for farm production activities. Forty nine (49) percent of respondents used their loans to acquire seed rice and also for land preparation whilst 72 % used theirs in purchasing agro chemicals for their farms and 73% for land preparation. In effect they used loans mainly for the purpose for which the loans were acquired and did not divert them to other non-farming activities.

This is in accordance with findings by Vincente and Vosti (1995) who found out that credit helps farmers purchase modern inputs such as high yielding varieties of seeds, fertilizers and install irrigation to increase production. Since rice is the main crop in the research area and is the staple food for a lot of Ghanaian households it can be seen that credit is an important element in agricultural production systems and therefore respondents in the study obtained credit to finance production activities. Proper management of credit enabled farmers purchase inputs which they said helped increase productivity and enhanced the welfare of households. Some female farmers said the provision of credit had positive effect on schooling of the girl child, it helped increase their asset holding, they were also able to have more control over decision making both at household and community levels. It helped increase their productivity and subsequently improved their standard of living.

The minority of respondents (19%) who used credit for other purposes indicated it was used: to pay school fees, for funerals, to take care of basic family needs, to pay old debts, for relaxation and to organize naming ceremonies. This confirms findings of Poliquit (2006) that credit made to small holder farmers was used for other purposes. Such farmers are not managing their credit properly since they are using credit for purposes other than what they acquired it for. In the long run they could have problems with increasing farm production and payment of their loans. In the short run, it does give some financial relief to meet basic needs of their families but then in the long run they could have problems with increasing farm produce and payment of their loans.

Picture 4.1 Manual way of harvesting



(Source: Kpong Irrigation Project)

Picture 4.2 A female rice farmer threshing rice



(Source: Kpong Irrigation Project)

Picture 4.3 Rice farmers drying Rice



(Source: Kpong Irrigation Project)

Picture 4.4 Rice farmer spreading rice for drying



(Source: Kpong Irrigation Project)

Picture 4.6 Rice heaped after harvesting at the KIP



(Source: Kpong Irrigation Project)

Picture 4.7 Rice bagged after drying

(Source: Kpong Irrigation Project)

4.5.1 Ease of accessing credit

The researcher also investigated ease of accessing credit. The data is presented in Table 4.19 below.

Table 4.19: Ease of accessing credit

Ease of Access	Frequency (n=200)	Percent
Easy	124	62.0
Very easy	46	23.0
Difficult	29	14.5
Very difficult	1	0.5
Total	200	100.0

Table 4.19 gives information about respondents' opinion about the ease of accessing credit. Eighty five percent (85%) of respondents said they had no difficulty in accessing credit whilst 15% of respondents reported that they had difficulty in accessing credit. For those .who said it

was easy accessing credit, it was because they were paid up members of the farmers' cooperative and had fulfilled all other requirements so they did not have any difficulties in getting credit facilities. Other farmers who had difficulties said so because of the documentation processes which they found complicated. They indicated because of their low level of education, they had problems with the documentation process. This supports findings by Nsiah Gyabaah & Edusah (1995) that credit from formal sources involves delays and completion of formalities too complicated for the small scale farmer.

4.5.2 Sufficiency of credit for farming

Out of those who had the credit facility (17%) said the loans were not sufficient in addressing their needs. However, majority (83%) indicated it was sufficient.

Table 4.20: Sufficiency of credit for farming

Sufficiency	Frequency	Percentage %
Sufficient	166	83.0
insufficient	34	17.0
Total	200	100.0

The size of a loan to an individual can influence the activity to which he puts the loan. A loan amount worth one third of the requirement may discourage the borrower from using it for the intended purposes whereas a loan amount far above what the borrower actually needs will also result in excess funds being used on unplanned and unproductive activities for which the borrower may not be able to repay when the loan repayment is due. For respondents who reported that the loans were not sufficient it was because the loan sizes were small and therefore they could not utilize the loan for the intended purpose. This conforms to findings by Atengdem (2002) who found out that there were high rates of loan default among beneficiaries who access lower levels of credit. Most respondents however indicated their loans were sufficient and they were also able to repay their loans.

The essence of the Kpong Irrigation Project was to assist farmers to become self-sufficient, food secure and improve their living standards (Tinsley, 2009). The study therefore tried to find out if rice farmers became self-reliant after taking the loans. That is, whether they have been able to acquire capital that would enable them establish a new form of financing their farms without resorting to taking loans. 49% affirmed that they were able to set some money aside and so gradually may not have to depend on loans, while 51% said they did not have enough savings to enable them establish their own farms in the future without going for further loans.

This pre-supposes, the Kpong Irrigation Project has not been sufficiently able in making majority of the rice farmers self-reliant. It is important that efforts are made by these credit providers especially organizers like GIDA and KIP to assist these farmers to become self-reliant in providing their own farming finance, rather than depending on loans for every small task on the farm. Farmers who are doing well should be encouraged to give loans to others and also assist these farmers to attain financial independence. This when done, will ensure food security for families and the nation as a whole. The farmers need to be educated to use their loans specifically for farming activities and not to meet other non-farming activities.

4.5.3 Time taken to access loan

From Table 4.21, it was observed that 53% of respondents said it takes between 1-4 weeks for credit to be delivered whilst 38.0% said it takes between 1 and 2 months for credit to be delivered.

Table 4.21: Time it takes to access loan

Source of credit	Length of time							
	Less than 1 month -4 weeks		1-2 months		3 month		Total	
	F	%	F	%	F	%	F	%
Friends	1	1	7	9	0	0	8	4
Relatives	5	5	4	5	0	0	9	4
Money Lenders	9	8	8	10	0	0	17	9
Traders	16	15	18	22	0	0	34	17
Banks	74	71	45	54	13	100	132	66
Total	105	100	82	100	13	100	200	100

Pearson χ^2 value = 1.41 df = 3 Asymp sig. (2 sided) = 0.702

Time of delivery of credit is an important consideration to farmers. This is because of the seasonality of agricultural activities. From Table 4.21, it was observed that 53% of rice farmers indicated they access the loan in less than a month after applying for it, while 47% had their loans one month or later. According to these 47%, the delay in the release of loans adversely affected their farming activities. Nineteen percent (19%) of these respondents indicated this late disbursement of loans was one of the reasons why their loans were used to meet other important household needs.

4.5.4 Perception of loan facility

Almost all respondents (99%) indicated they did not perceive loans as gifts. This pre-supposes respondents were aware that they had to pay back their loans or face sanctions including imprisonment. This sense of responsibility is good. It would ensure that debtors do not default in paying back loans and make them more trust worthy and also ensure that banks give them more loans.

4.6 Benefits of Accessing Credit

According to the rice farmers, access to credit has a lot of advantages. These have been indicated in Table 4.22. Respondents were able to undertake various activities due to the credit accessed.

Table 4.22: Benefits of accessing credits

Benefits of accessing credit	Frequency	Percentages (%)
Makes farming more easy and comfortable	190	95
Buy inputs and use machinery to ensure good yield	178	89
Increase the profit made from farm activities	176	88
Undertake farming while engaging in other projects	154	77
Farm rice and other crops all year round	152	76
Undertake land preparation and purchasing of inputs	136	68
Improved quality of produce	130	65
Harvest produce on time	130	65
Market produce	130	65
Attend to welfare needs of family members	100	50
Produce other crops	90	45

The provision of credit to small holder farmers especially women is not intended only for increasing productivity but also to contribute to their empowerment. Access to credit has the potential to significantly reduce poverty and has been found to strengthen crises coping mechanisms, increase and diversify income earning sources, build assets and improve the status of women (Gupta and Goetz, 1996; Atieno, 1997; Rosenzweig 2001; Okurat et al, 2004; Poliquit, 2006). Rosenzweig (2001) also found out that credit can improve income by enabling the undertaking of additional income generating activities and the rural households also can finance more consumption and have surplus finance for further investment.

From the responses above, it can be seen that farmers perceive many indicators as benefits from accessing credit. While credit providers may use profit and consequently increased repayment by farmers as a measure of benefits, farmers on the other hand see improved family welfare, expansion of business and other benefits as equally important. Therefore benefit of credit use is not measured by amount of profit made but how well it leads to improvement of family welfare.

4.7 Challenges in accessing loans

Despite all these benefits of accessing credit for their farm activities, rice farmers also gave some challenges they encountered while accessing credit facilities. Some of these are tabulated in Table 4.23. Their main challenge was with the high interest rate (67%) while the least challenge was wasting time in negotiating or meetings (30%).

Table 4.23: Challenges in accessing loans

Challenges in accessing loans	Frequency (n = 200)	Percentages (%)
High interest rates	134	67
Hindrance posed by group members of farmer cooperatives	110	55
Difficulty in getting lenders to approve loans on time	110	55
Delays in disbursement (leading to late spraying).	92	46
Lack of farmers participation in planning credit programme	90	45
Small loan sizes	90	45
Too many documents to sign	88	44
Waste of time in negotiation and meetings	60	30

From the results tallied in Table 4.6 majority of respondents, seventy-six (76) percent had little or no education. Since majority of the respondents had no education, it was not surprising that they indicated filling of documents was a challenge. For those who accessed credit from traders, one difficulty they expressed was the fact that they could not look for better prices for their produce. They complained that they were already tied up with rice traders who usually buy their produce and dictate the buying price which is usually lower than the normal market price.

Farmers also thought that interest rates should be reduced, minimum saving requirement abolished and bureaucracy reduced. Since most agricultural activities are time bound a slight delay in loan disbursements can have negative effects on farming activities example late transplanting and application of weedicides (due to late transplanting, not spraying of weedicides on time, late application of fertilizer) as well as lack of farmer participation in planning

agricultural credit programs. They are not able to undertake farming activities at the time they have to and the usefulness of credit is either reduced or lost. This in turn worsens the prospects of timely repayment and in the long term affects living standards of family members.

Another challenge faced by farmers in accessing loans has to do with hindrance posed by group members of farmers' cooperatives. According to Poliquit (2006) the principle behind establishing a cooperative society is that the society can borrow on better terms, can shoulder some of the costs of loan administration and also offer better security than individuals borrowing on their own account. Desai and Mellor (1993) however found out that in most countries, cooperatives are weak, cover only a small portion of the population and provide only a slight fraction of total credit needs of small farmers. This assertion by Desai and Mellor conforms to the situation at the Kpong Irrigation Project. The cooperative seems to be weak and that is another reason why some farmers look for credit elsewhere (outside the operations of ADB/KIP). There is the need for the farmers' cooperative to be strengthened so that it can perform its functions better.

4.8 Credit Management

Another significant objective of this study was to determine how the credit obtained by these rice farmers was managed. This section presents information about how the study sample managed their credit.

4.8.1 Training before and after taking loans

Respondents indicated that to prepare potential clients to effectively manage their credit, the KIP train potential clients before and after taking the loan. Sixty – three percent (63%) of the respondents indicated they had been given that training while 37% had not had the training.

The training included information in economic use of money/loans, understanding terms and conditions of banks before accessing loans, technical know-how on rice cultivation, improved techniques in rice farming and how to set and meet a budget and book keeping. This training of farmers ensures there is proper management and use of credit accessed from KIP.

This training aims at empowering and ultimately improving household food security and children's nutritional status. Technical training on credit management and use by borrowers is also associated with high repayment of loans.

Training farmers on the use of credit and also in bookkeeping enabled them maximize their benefits and reduce wastage of limited funds. Technical training on credit use and management to borrowers is also associated with high repayment of loans. It is therefore important for credit providers to continue to provide training and guidelines (if they are already not doing so) to ensure that farmers really use the loans for what they are intended it for. This is because; there is always the temptation for farmers to divert the loans into the production of other crops or to meet family needs.

4.9 TEST OF HYPOTHESIS

The study set out to test two hypotheses.

Hypothesis HO₁:

There is no relationship between source of credit accessed and use of credit.

Hypothesis HO₂:

There is no relationship between type of credit facility accessed and annual income of farmers.

Hypothesis HO₁:

There is no relationship between source of credit accessed and use of credit.

The chi- square test was used to determine whether there is any relationship between the type of credit accessed and the use of credit. This is presented in Table 4.24

Table 4.24: Sources of credit and use of credit

Sources of credit	Use of credit					
	For Farming		Non-farming		total	
	F	%	F	%	F	%
ADB/KIP	117	72	6	16	123	62
Other Banks	34	21	5	13	39	20
Market Traders	7	4	9	24	16	8
Money Lenders	4	2.5	18	47	22	11
Total	162	100	38	100	200	100

Pearson χ^2 value = 87.74, df=3 pvalue=0.000

Table 4.24 showed there was a statistically significant relationship between source of credit and use of credit, thus hypothesis one was rejected. This means that there is a relationship between the source of credit and how credit is used or managed.

Hypothesis HO₂:

There is no relationship between type of credit facility accessed and annual income of farmers.

Table 4.25: Type of Credit Facility accessed and annual income of farmers

Sources of credit	Annual household income												Total
	Below 1000		1000-3000		3001-5000		5001-10,000		Above 10,000		F	%	
	F	%	F	%	F	%	F	%	F	%			
ADB/KIP	5	38	40	55	38	72	17	52	23	82	123	62	
Other Banks	4	31	15	20	9	17	9	27	2	7	39	19	
Market traders	1	8	10	14	2	4	2	6	1	4	16	8	
Money Lenders	3	23	811	4	7	5	16	2	1	22	11		
Total	13	100	73	100	53	100	33	100	28	100	200	100	

Pearson χ^2 value = 17.486, df = 12 pvalue=0.1322

From Table 4.25, it shows there was no statistically significant relationship between the source of credit and annual income of farmers. The source of credit has no significant influence on the annual household income. Thus hypothesis two is accepted.

Conclusion

Chapter four presented information on the services provided by the KIP, demographic and rice farm information, sources of credit, credit packages available to farmers, reasons for accessing loans, benefits of accessing credit, challenges in accessing credit and credit management.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0. INTRODUCTION

This chapter provides a summary of the study, states conclusion drawn from discussions and recommendations of the study. The study arose from an interest in finding out how rice farmers access and manage their credit.

5.1 SUMMARY

The aim of this study was to find out how rice farmers at the Kpong Irrigation Project access and manage credit facilities available to them. The specific objectives in the study were to: access available credit packages for rice farmers, find out reasons why rice farmers access credit, find out the benefits (if any) that rice farmers derive from using credit, evaluate the problems (if any) that rice farmers encounter with the use of credit and finally, assess how rice farmers manage the credit taken.

The snow ball sampling was used to select two hundred rice farmers for the study. Six key informants were also purposively selected. The respondents were interviewed using a structured interview guide. The data was analyzed using the Statistical Package for Social Sciences (SPSS) software to generate frequency and percentage distributions. The chi-square statistic was used to test the null hypotheses.

A total of two hundred respondents comprising 125 males and 85 females made up the study sample. Seventy-one percent (71%) were married, 32 % had between 1-3 children, 62% had basic education, the average number of members in a family was five, and 43% were from the Dangme ethnic group.

The findings revealed that, majority of rice farmers were aware of two or more credit facilities that they could access to enable them boost their farming activities. Majority were of the opinion that, accessing credit was fairly easy, given that they had the right requirements and attitudes in following laid down procedures. They also listed banks, money lenders, traders and friends as some of the sources of accessing loans. It can therefore be concluded that, credit facilities are readily available to farmers who have need of such facilities.

The study found out some of the reasons why rice farmers access these credit facilities. The results show that, most of these rice farmers accessed loans in order to help them finance their farming activities in areas such as land preparation, purchasing farm inputs, such as seed rice agro chemicals and machinery as well as for threshing and harvesting; They also accessed these loans to ensure high yield and increase in profits from their farm produce.

The study further identified the benefits of these credit facilities to the rice farmers. It enables them achieve high yields as they are able to undertake land preparation, access labour, purchase farm inputs and rent/hire machinery with ease. They also indicated that it was due to the credit accessed that they could pay for labour required for harvesting and threshing.

It was also interesting to discover that, these loans greatly affected their livelihood as it increased their profits after selling their products. Even though most of the farmers claimed to make very little profits as a result of the high interest rates, they admitted that, the loans are always a great source of help. They also enumerated a number of challenges in their effort to acquire these loans which greatly affects them. Challenges such as delays in disbursing the loans, high interest rates, and small loan sizes were identified. These challenges they claim affect their farming activities and called for assistance in addressing them. The study also revealed that, as far as the management of credit was concerned, farmers received some form of training before and after the loans were disbursed. This, they believe enabled them manage the loans more effectively and ensured that they used the loans for the intended purposes.

5.2 CONCLUSIONS

In conclusion, the study revealed rice farmers had adequate knowledge about credit facilities and accessed credit from a variety of formal, semi-formal and informal sources. These loans were accessed mainly to help in their farming activities. The rice farmers derived some benefit from these loans especially in the short term since it helped improve on their farm production and in a way improve their livelihood and standard of living. Farmers also faced certain challenges with accessing loans. Finally because of the training given to clients before and after accessing the loans, majority of rice farmers were able to effectively use and manage their credit:-loans were used mainly for the intended purposes.

5.3 RECOMMENDATIONS

Based on the findings of the study, the following recommendations are made:

1. It is recommended that credit providers focus on introducing attractive packages with lower interest rates, easy registration processes and flexible payment terms. This will encourage more farmers to access loans and enable them expand their production which will ultimately lead to improve standard of living of families and the nation as a whole.
2. The government and other stakeholders like Ministry of Food and Agriculture (MOFA) could emulate the example of KIP to create other alternative credit packages for rice farmers so as to ensure families are food secure, become self-reliant and living standards of small holder farmers increases.
3. Training before and after the loans are disbursed is a major factor that impacts on the manner in which these loans are managed. The results even shows that, those who receive some form of training usually use the loans for the intended purposes, compared to those who do not receive any form of training. It is therefore recommended that, efforts are made to intensify these training programs so as to reduce mismanagement of scarce financial resources. These financial resources can then be used to improve the welfare of the family.

4. Since women who are empowered influence all members of their family positively it is recommended that the project authorities encourage more women to undertake rice production so they can contribute more to the improvement of welfare of family members.

5. It is finally recommended that the Osudoku Farmers' Cooperative should be further strengthened to become self- reliant for development and provide the total credit needs of its members. This would go a long way to make these small holder farmers self- reliant and put them in better positions to meet the needs of their families.

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APPENDICES

APPENDIX 1

A STRUCTURED INTERVIEW GUIDE FOR KEY-INFORMANTS / CREDIT PROVIDERS

Introduction

I am an M.Phil. Student of the Department of Family and Consumer Sciences of the University of Ghana, Legon conducting a study on “Access and management of credit by rice farmers at Kpong Irrigation Project”. I would be grateful if you could answer these questions to enable us gain information about the issues under study. All information provided will be treated as confidential and anonymity of respondents is assured.

Thank you.

CODE.....

SECTION A: INSTITUTIONAL INFORMATION

1. Name of Institution/ credit provider.
2. Location.
3. What kind of service do you provide?
4. How long have you been providing this service?
5. What is the aim of providing this service?
6. Who do you provide your service to and why?
7. What kind of service do you provide specifically to farmers?
8. What are the features of the credit service you offer?
9. In which form does the credit usually come?
10. How much do you give to each client?
11. What rate of interest do you charge?
12. How long do you allow borrowers to repay loans?
13. How long does it take after applying to access/have your loan?
14. Do you think the amount given is adequate to meet their needs?
15. If no, why? What do you do about it?
16. What are the requirements/ conditions/criteria for obtaining a loan from your institution?

17. Do you have any strategies put in place to ensure that clients utilize the credit accessed efficiently?
18. If yes to Question 16, what strategies have been put in place?
19. In your estimation, what is the level of patronage of credit from your outfit by client?
20. How do you promote your credit services to clients especially farmers?
21. How do clients pay back loans taken?
22. What do you think is the impact of the credit you provide on your clients?
23. What are some of the challenges faced when:
 - (a) Dealing with clients as far as credit is concern?
 - (b) In retrieving loans from clients?
24. Any other general information with regards to providing loans to farmers?

THANK YOU FOR YOUR PARTICIPATION

A STRUCTURED INTERVIEW GUIDE FOR RICE FARMERS

Introduction

I am an M.Phil. Student of the Department of Family and Consumer Sciences of the University of Ghana, Legon conducting a study on “Access and management of credit by rice farmers at Kpong Irrigation Project”. I would be grateful if you could answer these questions to enable us gain information about the issues under study. Be assured that any information provided will be used for research purposes only and treated as confidential. Anonymity of respondents is assured.

Thank you.

CODE.....

SECTION A: DEMOGRAPHIC CHARACTERISTICS

1. Area/ Name of Village
2. Name:
3. Age:
4. Sex:
5. Ethnic group you belong to:
6. Level of education.
7. Marital status:
8. What is your religious background?
9. Number of children (if any).
10. Are you the household head?
11. Number of people in your household.
12. How many household members are dependent on you?
13. On average, what is your average annual household income?
14. What are your source/ proportion of income from various sources?
 - a) Agricultural/ Farm income

- i. Crops
 - ii. Livestock
 - iii. Farm labour
 - iv. Rice / corn mill
 - v. Rental / labour for pre/ post harvest facilities
 - vi. Others specify
- b) Non agricultural/ Non-farm income
- vii. Small scale business
 - viii. Teaching
 - ix. Public servant/ government employment
 - x. Private employee
 - xi. Remittances from aboard
 - xii. Others specify

SECTION B: RICE FARM INFORMATION

- 15. How did you acquire the land for farming?
- 16. What plants do you cultivate?
- 17. How many years have you been farming?
- 18. How long have you been cultivation rice?
- 19. What is the size of your rice farm (hectares)?
- 20. Estimate your rice crop yield in the last harvest? (Bags/ Head pan or Scale weighted)
- 21. To whom do you sell your rice?
- 22. At what price did you sell your paddy rice last year (per bag)
- 23. On average, how much income did you earn?

SECTION C: ACCESS TO CREDIT

- 24. How do you finance your farming activities?
- 25. Did you apply for credit to finance your farm?

26. Are you aware of any credit programmes/ facilities in your place?
27. If yes, what credit programmes/ facilities are you aware of?
28. Do you have access to credit?
29. Have you ever accessed credit?
30. If yes to Question 29, from which source(s) do you access credit? (Tick as many as are applicable).
31. How did you get information about the credit sources in your area? (Tick as many as applicable).
32. Which of these source(s) in Question 31 do you prefer? Why?
33. What factors did you consider when choosing a credit source?
34. How much credit did you access in the last farming season?
35. In what form did the credit come?
36. Were you successful in acquiring the credit/loan?
37. If no to Question 36 why was your application not successful?
38. If yes to Question 36 was the amount you got sufficient?
39. What are the requirements for accessing credit from your source?
41. How long have you accessed credit from your source?
42. How easy is it accessing credit from your source?
43. How long does it take from the time you apply for the loan to the time it is disbursed?
44. What is the interest rate on the credit accessed?
45. What do you think of the interest charges on the loan?
46. Why did you access credit/ what did you use the loan for? (Tick as many as applicable)...
47. What other condition did you need to satisfy before the loan was granted?
48. What are the terms for repayment of the loan?
49. In which form do you pay back loan?
50. Did you make any savings after selling your produce?
51. What is the effect of the credit you receive on your saving?
52. After taking credit for your rice farming, have you been able to acquire some capital which would enable you establish a new form in the future without going for further loans.
53. Did you get the loan at the time you really needed it.
54. Do you use the credit acquired for other purposes apart from farming?

55. What other uses do you put the loan acquired to?
56. Are you able to repay your loan on time?
57. Why were you not able to repay on time?
58. What do you think will happen to you if you default in payments?
59. Do you see loan as a gift?
60. How much of the loan gets to you before disbursement?

SECTION D: MANAGEMENT OF CREDIT

61. Were you given any form of training before and after taking the loan?
62. If yes, who did the training and was it beneficial?
63. If no do you think training on how to effectively spend the loan is necessary? Why?
64. What are some of the benefits you have derived from accessing and using credit.
65. What are the problems or difficulties you encountered when applying for and / or obtaining credit?
66. Do you regret ever taking a loan for farming operations?
67. If yes, why?

SECTION E: SUGGESTIONS TO IMPROVE ACCESS TO CREDIT

68. What are you expectations among the credit programs in your area?
69. Do you have any suggestions/ recommendations to help improve?

THANK YOU FOR YOUR PARTICIPATION