

**FACTORS INFLUENCING DEFAULT IN SERVICING  
AGRICULTURAL LOANS: A CASE STUDY OF AGRICULTURAL  
FINANCE CORPORATION, MACHAKOS COUNTY**

**Salesio Miriti M`Muruku**

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Science in Agricultural Resource Management, Department of Dryland Agriculture,  
School of Agriculture and Veterinary Sciences, South Eastern Kenya University

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## DECLARATION AND APPROVAL

This thesis is my original work and has not been presented in any other university for an award of a degree.

Salesio Miriti M Muruku

Signature.....

Date.....

This thesis has been submitted for examination with our approval as university supervisors:

1. Prof. Dickson M. Nyariki

Signature.....

Date .....

2. Dr. Dorothy A. Amwata

Signature.....

Date.....

## **DEDICATION**

I dedicate this thesis to my family, friends and colleagues for their continued support which has seen me this far. I also dedicate my work to Agricultural Finance Corporation (AFC) Management for giving me time to study. All your efforts are greatly appreciated.

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## ABBREVIATIONS AND ACRONYMS

AFC	Agricultural Finance Corporation.
DFI	Development Finance Institution
MDGs	Millennium Development Goals
SPSS	Statistical Packages for Social Scientists
GoK	Government of Kenya
NCPB	National Cereals and Produce Board
CRB	Credit Reference Bureau
MFI	Micro Finance Institution
SEKU	South Eastern Kenya University
4K CLUB	<i>Kuungana Kufanya Kusaidia Kenya club</i>
GDP	Gross Domestic Product
USA	United States of America
MCDP	Machakos County Development Profile
MCIDP	Machakos County Integrated Development Plan
KNBS	Kenya National Bureau of Statistics
KPHC	Kenya Population and Housing census
IEBC	Independent Electoral and Boundaries Commission
SACCOs	Savings and Credit Cooperative Societies
JKIA	Jomo Kenyatta International Airport

## **ABSTRACT**

Farm credit offered by AFC is an important tool in poverty alleviation through creation of working opportunities for beneficiaries. The facility improves the economic and social status through poverty alleviation, employment creation and income generation for low income farmers with limited opportunities. Through this facility, the government mainly targets to improve the livelihood and food sufficiency among the rural populace. However, loan repayment is faced by high levels of default among the beneficiaries which hinders goal achievement. This study was done to examine the borrower and the lender dynamics that influence default among smallholder farmers in Machakos County in order to analyze farmers' debt servicing capacity.

To achieve this objective primary data were gathered through a survey using data from 100 farmers. Systematic random sampling technique was used to pick 100 clients who were selected from the county database of 701 farmers notwithstanding their repayment status. The selected farmers supplied data via administering a structured questionnaire. Descriptive statistics and a binary logistic model were employed for determining and analyzing default factors. The results of the binary logistic regression analysis showed variables to be either positively or negatively related to default. Four factors which were found to be statistically significant at 5% level are age, experience in farming, credit use and politics. Age and politics were found to be negatively related while experience was positively related to compliance in debt servicing. These factors are important and should be considered when designing a sustainable credit model.

The study recommends that the success of future lending in AFC lies in targeting to disburse loans to young but experienced farmers; lenders should train their loan beneficiaries and offer them adequate amount of loan and reasonable timeliness. The government should encourage enterprises diversification and pave way for technology improvement through a well-articulated agricultural extension program. Conclusively, the direction of influence of these determinants should serve as a guide, in efficient disbursement of farm loans in the future.

## **CHAPTER ONE**

### **1. INTRODUCTION**

#### **1.1 BACKGROUND OF THE STUDY**

Agricultural loan is intentionally structured for farmers to fund the processes involved in farming from production to consumption level. This means that financing also extends to the trade and processing of agricultural commodities. Farm loan is an indispensable tool for attaining the socio-economic transformation of rural communities. Successful agricultural development in most developing countries today requires increased resource productivity. Improving investment in productive agricultural ventures is necessary for accelerated economic growth. At low levels of income, the accumulation of savings may be difficult. Therefore, under such circumstances, access to loans can help poor farmers to undertake investment and enhance productivity through improved quality and quantity of farm products. The requirement for credit facilities is dictated by the limitations of self-financing, uncertainty pertaining to the levels of output, and the time lag between inputs and output (Kohansal and Mansoori, 2009). So, financing agriculture is critical to rural development in developing countries to alleviate poverty.

Access to credit becomes important as a developing country moves from traditional to more modern agriculture. The beneficiaries engage in agriculture as a business to help them uplift their lives and increase the country's income (Alwang, 2008). Credit is useful to farmers because it can be used for input purchases, investments, marketing and consumption. It enables farmers to purchase inputs associated with improved technologies. This agricultural intensification depends in part on the availability of financing of new, often manufactured inputs. The availability of financing opportunities increases the potential for expanding the land resource which is limited in most countries (Masters, 2008); facilitates capital formation and improvements on smaller farms; enables farmers to purchase or even rent land; helps in the marketing activities for the produce which requires cash outlays; makes high-return investments, long or short term, feasible for many farmers; helps farming households better manage their resources and

risks since they can borrow during bad years and pay back the loans during good years, and is used within cropping seasons to smooth consumption and provide cash at times of acute needs (Norton , 2008).

Default in its simple sense is non-adherence to agreed terms. A loan is said to be defaulted if any of the terms of repayment is not met. High levels of loan default among borrowers remain a major impediment to sustainable credit programs. The question of loan repayment by the farmer is important since it influences access to credit by the farmers. Loans are expected to be paid back on time to ensure the recycling of money for the benefits of other farmers. The borrower must undertake to repay the loan regularly regardless of the state of harvest (Upton, 1997). Naturally, default arises from bad weather plus risks and uncertainties facing agriculture such as outbreak of crop diseases, pests, floods and insect attacks. Other causes of default emanate from the borrowers' side or the lending institution. Default encumbers the development of the agricultural sector because it discourages further lending to both the existing and the prospective clients. Lack of refinancing puts the defaulters into a vicious circle of low productivity and poverty. Lenders also spend a lot of time and money to follow and recover defaulted debts. Successful repayment performance serves as a positive signal for increasing the volume of credit availability to various sectors of the economy (Acquah and Addo, 2011). An increase in the volume of credit helps to stimulate the poverty reduction goal. The loan default problem has been a tragedy as it leads to system failure to implement appropriate lending strategies and credible credit policies.

One of the main objectives of any government is to strive to become self-reliant in food production. This is achieved by increasing the access of credit facilities to small-scale farmers so that food and cash crop production would be increased. According to Ojo (1998), one of the problems confronting small-scale enterprises is inadequate capital. This happens even with the knowledge that these farmers produce the bulk of the food consumed locally and some export-crops which generate foreign exchange to the country. This situation attracted the attention of the Kenyan Government and led it into the

creation of AFC, which is a specialized institution mandated to cater for credit needs of the agricultural sector.

Most of the borrowers from the corporation are rural residents who turn to AFC as the counsel of despair. A majority of the farmers who borrow from AFC run small-scale enterprises; hence they have very unique challenges. These problems include shallow management skills of agricultural enterprises, often with limited experience and training, limited diversification with either one farm enterprise or sometimes new ventures, with little track record, and poor financial records. The above salient features of small-scale enterprises provide little incentive for any aggressive loan recovery mechanisms (Chirwa, 1997). Moreover, most of the farmers do farming out of frustration after retirement, loss of formal employment or collapse of businesses. As such these farmers are not passionate about farming. Most small-scale farmers regard farming as the occupation of the poor instead of considering the agribusiness like any other commercial venture. Most of these farmers have much attachment to traditions and cultural beliefs. Rural farmers have little or no knowledge and ability to secure finance to establish, develop or mitigate their farm enterprises against risk through insurance. A majority of farmers have inadequate information on relevant enterprises; hence they become victims of bad weather, pests and diseases. Moreover, farmers domiciled in rustic areas expect government loans to be repaid with little pressure or even be written off and therefore trust and rely so much on politicians.

Thus, in order to increase agricultural production and food self-sufficiency, there is a need to pump more capital into the agricultural sector through AFC and other credit institutions. In Machakos County, the institution has extended credit facilities to farming households to narrow the gap between the required and available capital. However, there is a serious loan repayment problem in the area. Therefore, this study was undertaken to analyze how non-default and default rates were associated with different loan parameters as well as individual and socio-economic characteristics of farm households.



## **1.2 STATEMENT OF THE PROBLEM**

One indicator of an effective lending institution is the credit servicing performance of the beneficiaries (Sengupta and Aubuchon, 2008). High repayment rates are beneficial to both the lenders and the borrowers (Godquin, 2004). If there is a high repayment rate, the relationship between the lender and their client will be good. Bond and Rai (2009) argue that a high repayment rate helps to obtain the next higher amount of loan. Conversely, a high rate of default reduces the loan funds available and requires a substantial amount of administrative cost and time to recover the loans. Thus, potential beneficiaries seldom benefit from reliable and preferential access to future loan funds. Repayment rates of agricultural loans have remained quite low and poor. As such, these loan schemes are more or less avenues of welfare or patronage, rather than sustainable commercial schemes. Strategic default by borrowers can make the lender to ration credit. It therefore follows that the demand for farm loan is higher than its supply. Consequently, this creates high moral hazard problems and mistrust, which deter financial needs of farmers. Default therefore makes the policy of providing affordable credit by government to small-scale farmers an illusion.

Improving repayment rates helps reduce the dependence of the institutions on government subsidies, which would improve sustainability. Also, it is argued that high repayment rates reflect the adequacy of institutions' services to clients' needs (Godquin, 2004). In order to maintain the sustainability of institutions, one important thing is to identify the socio-economic and institutional factors that significantly affect the performance of loan repayment rates from different perspectives.

Small-scale commercial farmers in Machakos County rely on credit from AFC, which is the only affordable source of finance. Unfortunately, AFC experiences a considerable problem of default mainly due to low repayment performance by beneficiaries. Therefore, there is need for empirical investigation so that findings can be used by AFC and other financial institutions to manipulate their credit programme for better service delivery. This state of affairs has necessitated this research to identify and ascertain the

underlying factors influencing credit repayment performance in AFC with reference to Machakos County.

### **1.3 SIGNIFICANCE OF THE STUDY**

Through timely application of credit facility, small-holder farmers are able to establish and expand their farms with the aim of increasing agricultural production, creating employment, enhancing food sufficiency, promoting household and national income, and augmenting the individual borrower's ability to repay borrowed fund. Credit resource is fundamental to the increment of total production and improvement of productivity per unit devoted by the farmer in agriculture. Credit access is crucial to small-scale farmers because it is the gate-way to all other resources on which farmers depend. Besides, it is an indispensable ingredient in the various aspects of farming operation. It mobilizes the inherent potentials of the economy so as to advance in the planned or expected direction. In Kenya, agricultural credit has long been identified as a major input in the development of the agricultural sector (AFC, 2009). Credit is important to the lives of the rural people in the developing economy. Rural populations contribute significantly to production since they have land and labour resources in plenty. For credit delivery to be efficient and sustainable, the repayment rate should be high.

This study will enlighten the financial institutions on factors influencing defaults of agricultural loans. These institutions will also obtain information on the problem of credit management in Kenya and the strategies to be put in place to manage them. In addition, the information obtained will help policy makers to formulate policies that are geared towards minimizing the level of loan defaults. This is because the growth of the financial sector provokes the government to come up with policies that address the various challenges within the sector so as to facilitate faster growth with minimum drawbacks. To the scholars and researchers, the results of this study will add to the body of knowledge on managing agricultural loans to farmers while also providing reference materials for future work. Furthermore, this study will challenge farmers and make a clarion call to politicians and the entire community to mobilize resources and marshal collaboration to ameliorate the state of affairs.

## **1.4 OBJECTIVES**

### **1.4.1 General Objective**

The main objective of this study is to establish the factors contributing to default in servicing agricultural credit among borrowers in Machakos County.

### **1.4.2 Specific Objectives**

1. To assess how borrowers' characteristics and situation affect servicing of AFC loans.
2. To investigate the extent to which the lender behaviour impacts on debt servicing.
3. To determine factors affecting the rate of credit allocation and repayment by farmers.

### **1.4.3 Hypotheses**

1. Borrowers' characteristics and situation influence servicing of AFC loans.
2. Lender behaviour influences AFC debt servicing.
3. A number of factors affect credit allocation and its impact on loan repayment.

## **1.5 LIMITATIONS OF THE STUDY**

This research was restricted to individual repayment performance among the AFC farmers in Machakos County due to the time and budget constraints. Although Machakos Branch covers both Machakos and Kitui Counties, only Machakos County was studied. In the area of study, there are many farmers. Some seek loans from financial institutions while others are self-financed. Among the financed farmers, the study was restricted to those who borrowed farm loans from AFC.

Machakos County covers a wide geographical area; hence the researcher spent more money and time than expected. Poor road network was a great challenge to accessing some areas such as Iveti, Masinga and Kiima-Kimwe. Coupled with this, harsh and extreme weather conditions hampered timely collection of data.

During the field visits, some respondents were not available and as a result, the researcher would go to look for them wherever they were or postpone the interview for another day. Some defaulting respondents especially the old and illiterate could not read or write and understand any other language apart from their mother tongue, *Kikamba*. Besides, they were unwilling to disclose all the information freely because they feared that punitive actions would be taken against them. In addition, others exaggerated responses especially those related to politics and land hoping that the government would relieve them of their loans or withdraw charges on their collaterals.

## **1.6 ORGANIZATION OF THE THESIS**

This thesis is organized into five chapters. The first chapter introduces the study. It presents an overview of the development of scheme loans in Machakos County. In the chapter, the main items covered in the thesis are captured. The chapter also gives the reason for doing research in the particular area, the benefits and the objectives to be achieved. Finally, the challenges encountered during the study are outlined. The second chapter deals with the reviews of related literature, where challenges of agricultural loans are cited. In this chapter, there is an in-depth discussion on loans and default, credit markets and the Agricultural Finance Corporation as the institution responsible for channelling these loans to the farmers. In the third chapter the methodology on data collection is discussed. Details about data analyses including model specification are outlined. The fourth chapter presents data analysis results using both the descriptive statistics and binary logistic regression. In addition, the chapter discusses the results of the findings. Finally, Chapter Five provides the summary findings, conclusion and recommendations of the study to various credit stakeholders, government, researchers and the public.

## CHAPTER TWO

### 2. LITERATURE REVIEW

#### 2.1 INTRODUCTION

This chapter summarizes the work conducted by previous researchers on agricultural financing and credit facilities. This forms the basis of comparison of the results found in the area studied in the past. The literature forms the background upon which the body of knowledge is derived. The following are the definitions of some of the operational terms in the body of literature review and the thesis.

- Interest rate: This refers to the premium received by the lender after a stated period of time (Chirwa, 1997).
- Loan default: This occurs as a result of dishonouring the agreement to meet the repayment terms which detail when money should be paid back to the lender (Upton, 1997).
- Defaulters: These are borrowers who are not able to honour their loan obligation when it falls due (Upton, 1997).
- Strategic default: This is whereby a borrower does not repay even if he/she is able to do so. This is deliberate refusal to service the loan (Stiglitz and weiss, 1981).
- Involuntary default: This arises from unfavourable circumstances that may affect the ability of the borrower to repay (Stiglitz and weiss, 1981).
- Moral hazard: This is when the borrower/farmer decides to change his/her economic behaviour after obtaining credit and as a result default with impunity (Sileshi *et al.*, 2012).

- Natural hazard: This means occurrence of natural factors which are beyond human control. Some of these factors include bad weather and catastrophes such as earthquakes and landslides. The effect of natural hazard is project failure (Sileshi *et al.*, 2012).
- Adverse selection: This is a situation where the lender imposes tough lending conditions to borrowers so as to provide a cover from risky clients. The situation occurs because the lender is unable to differentiate good borrowers from bad borrowers (Sileshi *et al.*, 2012).
- Information asymmetry: This is where the lender lacks the information about the borrower. This information is vital for making decisions pertaining to lending (Sileshi *et al.*, 2012).
- Debt suspension: This is a favour to farmers who are struggling to repay the loan. In this case, farmers with less loan balances are allowed to delay repayment for a certain period of time (Egbe, 1990).
- Interest forgiveness: This means waiver of all the interest so that the lender only recovers the principal from the borrower (Rashid, 1990).
- Interest concession: This is waiver of part of penalty interest. It implies that the borrower has to pay the principal, accrued interest and part of penalty interest (AFC, 2009).
- Loan rescheduling: This implies renewal of loan which is in arrears so that terms and conditions are rescheduled as if it was a new loan (AFC, 2009).
- Delinquency: A delayed instalment is said to be delinquent (Munene and Guyo, 2013).

- Arrears: This is a portion of the loan which is past due. That is it should have been paid but the borrower is late in remitting the repayment (AFC, 2009).

## **2.2 AGRICULTURAL CREDIT FACILITY**

### **2.2.1 Credit as an Important Factor of Production**

Loan fund (capital) is the principal resource besides labour, land, management, equipment and raw materials (Rhaji, 2000). Loan makes the latent potential or under used capacities functional thus spurring the activities of the engine of growth. This is because it ably energizes or motivates these other factors of production (Shepherd, 1979). Efficient credit allocation stimulates capital formation and diversified agriculture, increase resource productivity and size of farm operations, promote innovations in farming, improves marketing efficiency and value addition while enhancing net farm incomes (Nwagbo *et al.*, 1989). Strengthening poor farmers financially through new farm technological innovations leads to economic transformation and rural development. The resultant brunt is increased agricultural production, accelerated economic growth and growth in GDP of the country.

### **2.2.2 Importance of Credit Access**

Credit access is imperative for improvement in the quality and quantity of farm products, so as to increase farmer's income and reduce rural-urban drift (Kohansal and Mansoori, 2009). Under such circumstances, access to loans can help poor farmers to undertake investments and increase productivity. Availability of credit increases private investment in farming business which is a productive venture upon which majority of the population derive their livelihood. Since prices of inputs rise very rapidly every year, borrowed funds should be invested for productive purposes, and the additional incomes generated be used to repay loans so as to have sustainable and viable production processes and credit institutions. By timely embracing this facility, there has been a paradigm shift in farming business. This modification has seen farmers adopt new farming technologies, expand the scope of operation and enhance the purchase and use of some improved inputs which are not available on the farm.

### **2.2.3 Demand for Credit**

Demand for credit is high because farmers require capital for improvement on the land, for purchase of implements, new farm machinery, breeding stock, purchase of seeds, fertilizer as well as payment of wages of labour. These inputs not only increase in agricultural production but also play a role in production protections (Ijere, 1978). Farm loan enables poor farmers to tap the financial resources and take advantage of the potentially profitable investment opportunities in their immediate environment (Zeller and Sharma, 1997).

### **2.2.4 Sources of Credit**

Apart from owned sources of capital (savings or ploughed back profits) agricultural credit can be organized into two, informal /non-formal and formal sources. Informal sources of credit are usually non-governmental and they include cooperative societies, lending and gifts from relatives, merchants, friends, local moneylenders (Shylocks), and merry go rounds. According to Olomola (2001), credit from informal sources cannot contribute much to the process of agricultural development because of limitations associated with it. Despite these setbacks, informal sources of credit are extremely popular among smallholder farmers because of the relative ease of obtaining the loan and flexibility built into repayment. Formal sources of credit include agricultural and commercial banks. The formal sources are those established by law and can be influenced by government policies. Formal credit is the most reliable source of credit in terms of availability in optimal size and disbursement organization. Although formal credit is believed to be the most effective sources from the point of view of overall agricultural development, they are associated with a problem of inaccessibility by small-scale farmers.

### **2.2.5 Relevance of Agricultural Credit to Rural Livelihood**

Agricultural lending involves giving out of credit (in cash and/or kind) to small-scale farmers for the purpose of farming. There is no doubt about the crucial roles of credit in economic development. Well-functioning rural financial institutions are essential to improving economic efficiency, reducing income risk and meeting income distribution goals (Norton, 2008). In order to increase agricultural productivity especially among the



poor and rural households in maintaining food security, many governments in developing countries initiated credit programs with the idea that rural smallholder farmers will have access to formal sources of credit (Dong *et al.*, 2010). These governments have formed agricultural institutions to channel government funds to farmers. They have also mandated the commercial banks to give credit facilities to the agricultural sector of the country. In low-income countries like Kenya, smallholder farming dominates the national economy. Such farming faces severe shortage of financial resources to acquire agricultural inputs.

### **2.2.6 Differences between Agricultural Loan and other Formal Loans**

Agricultural credit is somewhat different from most loans offered by formal financial institutions. In other loan types, such as salary loan and business loan, the repayment is by instalment. Hence, formal financial institutions can easily monitor loan repayment and this reduces default. On the other hand, agricultural credit is offered as terminal loan, in that both the principal and the interest are paid at the end of the loan period. The borrower must undertake to repay instalments and interest on the loan annually regardless of the state of harvest. In good years, the farmer produces a surplus over and above the cost of servicing the loan, but in bad years, even if he makes a loss, he still has the loan service charges to meet. His residual net income will therefore fluctuate more widely than if he had not incurred the debt. The more the farmer borrows, the greater will be the variation in his residual net income. This is called the “principle of increasing risk”. The lender also faces a risk that the borrower will default and the loan will not be repaid (Upton, 1997).

Farm loan is a type of secured loan. Before making a loan the lender requires some assurance that the borrower is credit worth. As per Central Bank’s memorandum, agricultural loans should be backed up or secured by real estate property and other agricultural collaterals such as crops, livestock and work animals. The financial profile and the net worth of the farmer help to determine his loan servicing ability. Credit history obtained by spooling Credit Reference Bureau’s report enables the lender to determine credit worthiness of the borrower.

### **2.2.7 Types of Borrowers**

Norell (2001) has highlighted the four categories of borrowers: (1) willing and able to repay; (2) willing but unable to repay; (3) unwilling but able to repay; and (4) unwilling and unable to repay. For very late loans, credit officers should visit the case and classify the client into one of the above four categories. Based on the classification of borrowers, the loans officer takes corrective actions which are grouped into three categories namely: (1) having the credit officer and the supervisor visit the client's farm; (2) rescheduling should be considered for clients with a very good excuse; and (3) the institution can pursue legal action or inform the community and influential persons of clients' unwillingness to repay.

### **2.2.8 Causes and Significance of Multiple Borrowing**

From an economic perspective, there is a lot of competition from lending institutions. This means more firms are competing for a limited market share. Thus, they have to adjust closer to the needs of the customers and lower the interest rates. This phenomenon has brought benefits while also introducing challenges to farmers. Armendariz and Morduch (2004) noted that these adverse effects fall back on lenders who struggle to maintain their performance level. Borrowers are facing serious problems from paying back their loans, which eventually increases the risk of over-indebtedness which causes sociological and psychological constraints. Also, according to Srinivasan (2009), intense competition lowers borrower selection standards, weakens relationships with customers and leads to multiple loan-taking resulting in high default rates.

According to Hermes *et al.* (2009), multiple borrowing has gained a considerable amount of negative reputation during the past years. It was perceived to be one of the main causes for over-indebtedness because borrowers can take on so much debt from different lenders that they eventually are not able to repay. The study also found that most of the deposits taking microfinance institutions were offering multiple loans to customers. Multiple borrowing has a negative impact on loan repayment because the more the number of loans, the higher the default rate.

Several studies have confirmed a negative relationship between multiple borrowing and default rates. For instance, Mwangi (2013) studied the effect of competition on the loan performance of deposit-taking microfinance institutions in Kenya. It was established that the adoption of multiple loan taking largely affects the loan performance of these microfinance institutions. Therefore, the study recommends that for improved loan performance of clients, MFIs should not offer multiple loans. Field staff and loan officers should put into consideration the borrower's ability to repay their loans. MFIs should always use credit scoring when offering loans to their customers. Multiple borrowing was perceived to be one of the main causes for over indebtedness. Borrowers can take on too much debt from different lenders that they eventually may not be able to repay. Most of the deposit-taking microfinance institutions were using selection standards in offering credit to customers. The more discriminative the scoring system is, the better are the customers ranked from high to low risk and the quality of the credit scores risk ranking and calibration determines the rate of loan defaulting.

Diaz and Jesila (2011), in their study on multiple borrowing in the Philippines, found that the majority (80%) of respondents did not recommend multiple borrowing and instead recommended to stick to one loan at a time. The remaining (20%) appeared to be risk taking-types and who choose multiple borrowing. The majority acknowledged the stress and mental burden that goes with multiple borrowing when expected income did not come and there was not enough money to cover the needs of the family, business and lenders. Evidence shared by respondents during informal discussions highlighted this stress, which left borrowers sad, depressed, short-tempered and often angry, having fights among family members and losing the affection among friends. Respondents cited four reasons for taking additional loans as: additional capital for business (37%); school fees for children and family needs (33%); medical expenses for the family (11%); and meeting basic household needs such as food and shelter (11%).

## **2.3 STUDIES ON LOAN DEFAULT**

Loans taken from credit institutions vary from country to country, region to region and sector to sector. But most credits of developing countries have been found to share one common characteristic; they suffer from a considerable amount of default rate (Kashuliza, 1993). The following sections provide the literature related to studies on default.

### **2.3.1 The Essence of Default**

Despite the importance of credit in promotion and development agribusiness, its acquisition, management and repayment are faced with numerous challenges (Afolabi, 2010) especially for the smallholder farmer (Awoke, 2004). However, rural farm production involves greater risk and uncertainty. There is risk of crop failure through outbreak of crop diseases, floods and insect attacks. These risks inherent in farm production hinder prompt loan repayment. This in turn affects the amount of credit given to farmers. On the same note, Olagunju and Adeyemo (2007) argued that the problem of default in the repayment of agricultural loans hampers the development of the agricultural sector, because it dampens the willingness of the financial institutions to increase lending to the sector. The end result of non-payment is considerable ration of funds to greater majority of loan seekers, thus requires substantial amount of administrative cost and time to recover the loans in default (Udoh, 2008). Therefore as a result of the default rates, most credit institutions are becoming more reluctant to extend loan to smallholder farmers (Afolabi, 2010; Olagunju and Adeyemo, 2007) who critically need the credit facility. Awunyo-Vitor (2012) reported in empirical studies that large rate of default has been a major problem in agricultural credit delivery and sustainability causing many formal financial institutions to suspend agricultural credit. However, failure to repay loans on time or to repay them at all has been a serious problem in agricultural credit administration faced by smallholder farmers. In addition, it discourages the financial institutions from refinancing the defaulting members, which put the defaulters once again into vicious circle of low agricultural productivity and poverty. In the context of providing credit to the rural asset-poor, what is required is institutional innovation that

combines prudent and sustainable banking principles with effective screening and monitoring strategies that are not based on physical collateral such as land.

### **2.3.2 Factors Influencing Default Rate**

The determinants of loan repayment rates for agricultural loans were investigated by Brehanu and Fufa (2008). Using probit and logit regressions, they conducted a study on the determinants of repayment performance among small-scale farmers in Ethiopia. In the study, they found that borrowers with larger farms, higher numbers of livestock and farms located in a rainfall area had a higher capacity to repay loans, since all those factors increased the farmers' productivity and income. The study also found that borrowers who had extra business income and were experienced in using agricultural technology had a good repayment performance.

The main factors influencing loan repayment from the lender side are high-frequency of collections, tight controls, good management of information system, loan officer incentives and good follow-ups (Breth, 1999). In addition, the size and maturity of loan, interest rate charged by the lender and timing of loan disbursement have also influence on the repayment rates (Oke *et al.*, 2007). The main factors from the borrower side include socio-economic characteristics such as, gender, educational level, marital status and household income level.

Okorie (1986) studied the repayment behaviour in an agricultural corporation in Nigeria. In his study on borrowers, he found that the nature of the loan, either cash or in kind (seeds, fertilizer and equipment) can influence the borrowers' repayment behaviour. He found that borrowers who received a loan in kind had higher repayment rates than borrowers who received a cash loan. This was because many borrowers misused the cash, diverting it into personal consumption instead of investing in making their business productive. Regular visits by the loan officer to the borrowers' business site and loan profits generated by the borrowers also contributed to higher loan repayment by borrowers. Overall, the loan repayment performance can be influenced by three factors: borrower characteristics, business characteristics and loan characteristics.

Okorie (1986) examined the major determinants of agricultural smallholder loan repayment in Ondo State, Nigeria. His study identified the nature and timeliness of loan disbursement, the number of supervisory visits by credit officers, profitability of the enterprise on which the loan funds were invested as factors that stimulate loan repayment. Similarly, Oladeebo and Oladeebo (2008) examined the determinants of loan repayment among smallholder farmers in Ogbomoso Agricultural Zone, Nigeria. His results from multiple regression analysis showed that amount of loan obtained by farmers, years of farming experience with credit and farmers' level of education positively influenced loan repayment.

Chaudhary and Ishfaq (2003) examined the credit worthiness of 224 rural borrowers in Pakistan using logistic regression. They found that female borrowers with higher education who involved in a non-farm business activity using the loans for investment had a higher probability of repaying their loan. The study also noted that subsidized interest rates did not have a significant effect on repayment behaviour among rural borrowers in Pakistan. Thus they concluded that a subsidized interest rate was not the best way to ensure good loan repayment by borrowers.

Eze and Ibekwe (2007) examined the determinants of loan repayment under the indigenous financial system in Southeast Nigeria. Empirical results from their multiple regression analysis revealed that the amount of loan received, age of beneficiary, household size, years of formal education and occupation were critical for loan repayment under the system.

Mashatola and Darroch (2003) analyzed the factors affecting the loan status and repayment scheme of sugarcane farmers who received graduated mortgage loan in Kwazulu- Natal, South Africa. Their results showed that farm size (using annual gross turnover as a proxy), access to off-farm income, and average annual gross turnover relative to loan size as a criteria in selecting potential farmers for such scheme as they provided additional liquidity to fund future operations and debt repayment.

Kohansal and Mansoori (2009) investigated the factors affecting loan repayment performance of farmers in Khorasan- Razavi Province of Iran. Their results from a logistic model showed that loan interest rate, farming experience and total application cost in a descending order were the most important factor affecting repayment of agricultural loans.

Chirwa (1997) analyzed the determinants of credit repayment among smallholder farmers in Malawi using a probit model. His study revealed that sale of crops, size of the farmers' group, and the level of diversification, income transfer and the quality of information as the determinants of agricultural credit repayment.

Bassem (2008) examined the factors that affect the repayment performance of group lending in Tunisia. Empirical results from a logistic regression showed that the repayment is influenced positively by the internal rules of conduct, the same business, and the knowledge of the other members of the group before its formation, peer pressure, self-selection, gender, education and non-financial services. However, homogeneity and marital status had a negative influence on repayment.

Agricultural household models suggest that farm credit is not only necessitated by the limitations of self-finance, but also by uncertainty pertaining to the level of output and the time lag between inputs and output (Kohansal and Mansoori, 2009). Also, facilitation of access to credit for the rural poor plays a role in alleviating rural poverty. Thus, in order to increase agricultural productivity especially among the rural households in enhancing food security, many governments in developing countries initiated credit programs with the idea that rural smallholder farmers will have access to formal sources of credit (Dong *et al.*, 2010).

Also a study by Awunyo-Vitor and Abankwa (2012) revealed that 64% of formal financial institutions do not offer credit to farmers due to poor repayment by the beneficiaries. Another important aspect is the interest rates. Interest rates can be defined

as the premium received by the lender after a stated period of time. From the borrowers' point of view, it is the cost of capital at the time of obtaining a loan. Interest rates are signals that affect the channelling of funds to demanders or borrowers from suppliers or savers, directly or through financial intermediaries. Since interest rates and time are closely related, the expression that "time is money" is helpful in understanding the financial demand-supply linkage and, in turn, the determination of interest rates (Stiglitz and Weiss, 1981).

### **2.3.3 Default Rate and Gender Differences**

Theoretically, several arguments have been put forward to explain gender-differences with respect to loan repayment rates. For instance, Todd (1996) attested to better loan repayment performance in Bangladesh, arguing that women were more conservative or cautious in their investment strategies. In support, Rahman (2001) and Goetz and Gupta (1996) argued that women are more easily influenced by peer-pressure and the involvement of the lender. Concerning reputation and honour, women are more sensitive to verbal hostility on the part of the lender, while men are able to default with a sense of impunity. Also, Goetz and Gupta (1996) argued that women have more motivation for loan repayment in order to continue remaining in village groups and to be allowed to borrow more next time, whereas men have many more opportunities for social contact that can lend them money. Due to their tendency to stay closer to their homes rather than going out to work, women are easy to monitor and follow by the lender (Aghion and Morduch, 2005; Goetz and Gupta, 1996). As opposed to men, Aghion and Morduch (2005) posited that women have more at stake when enrolling in a credit programs because of the limited access to credit from other formal or informal channels. Therefore, women repay their loans to ensure continued access to credit. Ameen (2004) argues that women have more contact with the lender and group members. This is due to lower opportunity cost of time, which makes their time less valuable. Gibbons and Kasim (1991), on the other hand, reported that the number of women who had no debt repayment problems was 95% compared to 72% of their male counterparts.



#### **2.3.4 Default of Loan and Age**

According to the findings of different studies, the effect of age is threefold: That is, positive, negative or ambiguous. Reta (2011) in his study on the determinants of loan repayment performance in the Addis Credit and Saving Institution, Addis Ababa, Ethiopia noted that age had a positive impact on loan repayment performance. His findings revealed that with an increase in age, borrowers become stable and experienced in their undertakings. Besides, they accumulate more income and wealth over the years and they are more responsible. These factors give older borrowers an upper hand in loan repayment than younger ones.

However, some of the researchers have found age to have a negative influence on loan repayment. This means that there is a tendency in increased loan default with an increase in age of the borrower. An example is Ayanda and Ogunsekan (2012) who investigated the farmers' perception on loan repayments obtained from Bank of Agriculture in Ogun State of Nigeria. Their findings revealed that 45.8% of the loan borrowers were between 31-40 years of age while 36.7% of them were between 41-50 years of age. The mean age of the respondents was 39.36 years. The study established a negative relationship between the age of the farmers and loan repayment. They attributed this to the fact that young borrowers were innovative, venturesome and energetic thus translating into higher farm production and increased income that can be used to service the loan. Conversely, older clients have limited capabilities to enable them perform tedious farm activities. This results into decreased farm yield and income and consequently the inability to repay their loans.

Other studies have found that age variations have ambiguous influence on loan servicing. For example, Mokhtar *et al.* (2003) analyzed the determinants of microcredit loans repayment among microfinance borrowers among Tekun and Yum borrowers in Malaysia. The study established that both the young and old borrowers contributed to debt repayment challenges. Borrowers aged between 18-25 years had a higher probability of loan default. These findings are in tandem with the argument that older borrowers are more responsible and disciplined in loan servicing performance than younger borrowers.

Young people were found to lack experience in their undertakings and commitment in debt servicing. Borrowers in the age bracket of 46-55 years had a tendency of not keeping up to date with their debt servicing. This finding goes against the hypothesis that older borrowers were more responsible in repaying their loans than younger borrowers. The reason why old farmers had more loan repayment challenges was because of family financial obligations and business expenses.

### **2.3.5 Types of Default**

Default on borrowed funds could be voluntary and involuntary. Involuntary default on borrowed funds could arise from unfavourable circumstances that may affect the ability of the borrower to repay. On the other hand, voluntary (strategic) default, arises when a borrower does not repay even if he/she is able to do so (Stiglitz and weiss, 1981).

### **2.3.6 Causes of Default and the Role of a Lending Institution**

Awoke (2004) reported that high rates of default arise from poor management procedures; loan diversion and unwillingness to repay; lack of enforcement of loan contracts; low and poor recovery performance; government imprudent interference; high risk of agricultural production and the low level of commercialization in farming business. On the part of the lending institutions, they often lack detailed local knowledge about the beneficiaries' creditworthiness. These institutions also face problems in screening beneficiaries before lending and monitoring use of loans and ensuring repayment. According to Awoke (2004), high rate of default threaten the sustainability of agricultural credit schemes. This makes agricultural lending to be a risky enterprise because repayment of loans can seldom be guaranteed. Strategic defaulting of loan is quite widespread among the opportunistic farmers who consider government sponsored agricultural loans more as gift than as debt that have to be paid back.

According to Norell (2001), the most common reasons for the existence of defaults are the following: if the institution is not serious on loan repayment, the borrowers are not willing to repay their loan; clients' lives are often full of unpredictable crises, such as illness or death in the family; if loans are too large for the cash needs of the business,

extra funds may go towards personal use; and if loans are given without proper evaluation of the business.

Many financial institutions in developing countries provide financial services such as saving and credit to aid several smallholder enterprises. This is an effort in line with the Millennium Development Goals (MDGs) which seeks to reduce poverty by 50% by the year 2015. However, the sustainability and continuity of the financial institutions to increase the volume of credit to stimulate the poverty reduction goal depends on the repayment rates. High repayment rates allow the institutions to lower the interest rates and processing costs and consequently increase patronage of loans. High repayment rates reduce the subsidy: - dependence of the credit institutions to help them reach a better sustainability level. Repayment performance thus serves as a positive signal for increasing the volume of credit availability to various sectors of the economy. However, the financial institutions continue to decline credit to the agricultural and fisheries sectors. This decline is partly due to poor loan repayment performance from these sectors. Most of the loans default in these sectors could arise from poor management procedures, loans diversion and unwillingness to repay loans as well as other socio economic characteristics. However, despite the importance of repayment rates on the sustainability of financial institutions, and poverty reduction, within the Kenyan context, very few studies have tried to investigate loan repayment performance among farmers. The inability of borrowers to repay the loans is crucial for the long-term sustenance of the credit institutions.

### **2.3.7 Solutions to Default**

In order to achieve self-sufficiency, reducing default rate is very crucial for any lender. Financial institutions should take a number of actions to reduce default rate or the amount of arrears. Norell (2001) recommends some strategies for preventing or reducing loan default. Giving training to the clients prior to the transaction of each loan and financial incentives for the credit officers has potential to lower the default rates. Vento (2004) also defines the incentives as access to the subsequent loans also helps in timely repayment and reducing default. In addition, quick follow-up visits right after a missed

payment and the formation of strong solidarity groups are crucial to preventing high default rates. Limiting geographic scope reduces time and money wasted travelling from the office to clients' businesses. If credit officers have a specific geographic region, they can visit clients more often and this helps to develop relationships in their neighbourhoods. Loan should be given to the borrowers who have been in agribusiness at least twelve months because experience lowers risk than if the project is a start-up.

#### **2.4 TYPES OF LOAN DIVERSION**

Diversion of the use of loan is sometimes intentional and sometimes it is unintentional. Diversion could also be full or partial. The intentional diversion of the use of loan is when loan is used for unproductive activities and so considered as a negative indicator of loan use and it is hypothesized that the lending institution does not supply the loan other than for the purpose of income generating activity. Therefore, the intentional diversion of the use of loan refers to the diversion of loan use from the productive sector to unproductive sector. On the other hand, the unintentional diversion of the use of loan compels the household to spend part of the loan or full of it for the purposes that are not mentioned in the application form. Many respondents reported that they never liked to divert the loan for any other use than was specified in the loan application. But circumstances compel them to utilize the loan in different ways. To some, it may be due to acute poverty. To others, illness of the husband, educational needs of the children, sickness of the respondent herself, and unemployment of the husband or some other needs (Khaleque, 2010).

#### **2.5 IMPACT OF POLITICS ON LOAN REPAYMENT**

Rashid (1990) studied interest forgiveness programs for rural loans in Bangladesh: implications of recent programs. The study found out that the government program of interest forgiveness on rural loans is a political tool frequently employed by the Bangladesh Government. It was started to respond to natural calamities such as floods and cyclones or as an effort to improve loan recovery. The effect of these programs on the poor cause more harm than help because they destroy the viability of commercial banks and the financial discipline of the formal lending sector as a whole. Three

successive programs of interest forgiveness for agricultural loans were undertaken by the Bangladesh government during the period 1984 to 1986. The loans that were given were not actually "loans", but virtual grants as repayment was not expected, and they were viewed as relief handouts. Bangladesh Government also undertook a drive for loan recovery through interest exemption. Borrowers were encouraged to repay their loans. If they did so, they would be exempted from interest payments on a graduated scale. Interest forgiveness program interferes with financial discipline and establishes bad precedents with negative implications for future loan recovery. In the context of the budget announcement, the government decided to bear part of the loss due to agricultural credit remissions resulting from pronouncements of forgiveness. One supposed objective of President Ershad's 1986 interest remission program was to prosecute defaulters of large loans and the borrowers who did not respond to the amnesty. Because of patronage borrowers view government loan as a grant from foreign donors, which they strongly feel should not be repaid. Repeated announcements of forgiveness entrench these notions.

The role of the government is to extend credit facilities to farmers to narrow the gap between the required and the owned capital and enable them to use improved agricultural technologies that would increase production and productivity. The government sponsored credit provision schemes have a policy of providing subsidized credits to resource-poor through supply of funds for increased agricultural production. The realization that credit is a critical factor in agricultural development has made most of the governments in the developing countries, to have a channelling bank, which lends agricultural credit. This has become an increasingly important policy instrument for increasing agricultural output particularly among the rural poor (Egbe, 1990).

Ejike *et al.* (2013) studied agricultural credit risk and default management by banks in Imo State, Nigeria and ascertained that agricultural loans are characterized by high levels of default, in many cases above 50%, have been recorded by Nigerian banks. These lenders are reluctant in financing agricultural firms because of credit risks, defaults and high costs of loan administration (Sanderatne, 1986). This has led to the adoption of several measures by government to encourage the flow of bank credit to farmers.

Recently, the government has introduced a new agricultural credit scheme. The scheme involves a tax waiver on interest earned by banks on loans to agricultural sector and reduction of interest rate to farmers through government subsidy. It was reported that “the tax relief was based on the agreement by stakeholders that interest rates on agricultural loans be reduced in return for government suspension of tax on such facilities. With interest rate for agricultural loan current put at 14%, the government has undertaken to subsidize the payment of the 14% by 6%, which in effect, brings the interest farmers will pay on such loans to 80% (CBN, 2006).

## **2.6 IMPACT OF TECHNOLOGY**

Various scholars have done studies to show the importance of technology. For example, Shalini (2011) studied the institutional credit to agriculture and its impact on farm economy in Tumkur District, Karnataka, India. The results revealed that institutional finance promotes the adoption of modern technology and increases private capital investment in agriculture. Further, he established that input use enhances modern production technology for increasing agricultural productivity and production. Essential inputs along with modern technology are crucial for higher productivity among the small and marginal farmers whose savings are negligible.

Technological change and technical efficiency contribute to agricultural growth. Technology is important to small and marginal farmers for survival and to the large farmers for enhancing their income. Adoption of high yield seeds and fertilizer consumption had positive influence on agricultural credit flow. Improvement in adoption levels of modern crop production technology helps in agricultural credit flow. The development and transfer of technology assumed greater importance especially in the context of both irrigated agriculture and rain fed farming. Indian agriculture developed over time and showed all signs of resilience to natural shocks like droughts and famines by expanding irrigation and spread of technology (Shalini, 2011).

In addition, Oladeebo and Oladeebo (2008) studied the determinants of loan repayment among small holder farmers in Ogbomoso Agricultural Zone of Oyo State, Nigeria. They

noted that availability of adequate and timely credit helps in expanding the scope of operation and adoption of new technology as well as enhancing the purchase and use of improved inputs, which are not available on the farm. This leads to increased adoption of technology, enhanced income generating ability and better loan repayment capacity of the farmer.

A study done by Idoge (2013) on regionalizing loan repayment capacity of small holder cooperative farmers in Nigeria: Exploring South-South Nigeria showed that use of credit has been envisaged as one way of promoting technology transfer, while the use of recommended farm inputs is regarded as key to agricultural development. While credit to the agricultural sector remains a veritable tool for agricultural transformation and economic growth, credit repayment is of paramount importance to have viable financial institutions.

## **2.7 STUDIES ON CREDIT MARKETS**

### **2.7.1 The Functioning of Credit Markets in Developing Countries**

The fundamental features that create imperfection in credit markets are informational constraints. Ray (1998) stated that informational gap occur at two basic levels. First, there is inadequate information regarding the use to which a loan will be put. Second, there is limited information regarding the repayment decision of borrowers, as well as limited knowledge of the defaulter's subsequent needs and activities. All the important features of credit markets can be understood as responses to one or the other of these informational problems.

Behrman and Srinivasan (1995) stated about the arising of agency problem in the functioning of credit market. This problem exists when there are different goals between creditors, shareholders and management. Financial intermediaries may reduce agency problem by monitoring borrowers and make wise investment choices.

### **2.7.2 Adverse Selection, Moral Hazard and Information Asymmetry**

Adverse selection and moral hazard are the two most important problems in the functioning of credit market; both are driving from the imperfect information. Kono and Takahashi (2010) stated that imperfect information significantly increase default risks caused by adverse selection, moral hazard and strategic default. According to Armendariz and Morduch (2010), both problems are made worse by the difficulty of enforcing contracts in regions with weak judicial systems. The adverse selection occurs when the lender cannot easily determine which customers are likely to be more risky than others. Therefore, the lenders would like to charge riskier customers more than safer customers in order to compensate for the added probability of default. But the problem is the lender does not know who is who, and raising average interest rates for everyone often drives safer customers out of the credit market (Armendariz and Morduch, 2010). Those who are willing to repay high interest rate may, on average, be worse risky; they are willing to borrow at high interest rates because they perceive their probability of repaying the loan to be low (Stiglitz and Weiss, 1981).

Moral hazard arises because banks are unable to ensure that customers are making the full effort required for their investment projects to be successful. Moral hazard also arises when customers try to abscond with the bank's money (Armendariz and Morduch, 2010). In the absence of collateral, the lender and borrower do not have the same objectives because the borrower does not fully internalize the cost of project failure. Moreover the lender cannot stipulate perfectly how the borrower should run the project (Berhanu, 2005). When the clients' borrow money from the lender, they promise to work hard and repay a loan. But, once the loan is disbursed the borrower might not keep their promise but instead change their behaviour. Failure of borrower's business makes the lender to perceive him as a defaulter. In this case, a lender may not be able to know whether this failure was due to the uncontrollable factors or putting less effort on the business activities or borrowers mishandling of the loan.

Karlan and Zinman (2006) stated that better understandings of information asymmetries are critical for both lenders and policy makers. For instance, adverse selection problems



should motivate policy makers and lenders to consider subsidies, loan guarantees, information coordination, and enhanced screening strategies. On the other hand, moral hazard problems should also motivate policy makers and lenders to consider legal reforms in the areas of liability and enhanced dynamic contracting schemes. Armendariz and Morduch (2010) stated that the information asymmetry problems could potentially be eliminated if lenders had cheap ways to gather and evaluate information on their clients and to enforce contracts. However, Behrman and Srinivasan (1995) stated that one way for the government to improve enforcement conditions for credit markets is to improve the possibilities for usable sources of collateral like implementation of land registration. In addition, Mohiuddin (1993) as cited by Berhanu (2005) stated that the problem of moral hazard is solved in formal sector poverty lending by tying credit and saving together, by having a built-in mechanism for emergency fund to handle unforeseen shocks due to market failure and price changes, and by its emphasis on borrower-initiated lending to avoid loan use in risky unknown ventures where markets or input supplies are uncertain.

In order to overcome the problems associated with limited information, the credit scheme takes an advantage of local information, peer support, and, if needed, peer pressure. The borrowers may have better information about individuals' efforts and/or abilities than the lender (Besley and Coate, 1995). Besides, the joint liability element generates individual incentives to screen (mitigating adverse selection), monitor each other (mitigating moral hazard) and enforces repayment (Tesfay, 2009). Moreover, dynamic incentives also help to generate information by starting with small loans and gradually increasing loan size as customers demonstrate reliability (Armendariz and Morduch, 2010).

## **2.8 LITERATURE ON AGRICULTURAL FINANCE CORPORATION (AFC)**

AFC is a wholly owned Government Development Finance Institution (DFI). The corporation is mandated to assist in development of agriculture and agricultural industries by making loans to farmers, co-operative societies, incorporated group representatives, private companies, public bodies, local authorities and other persons engaging in

agriculture and agricultural industries. The mandate also extends to providing managerial and technical assistance to the loan beneficiaries (GoK, 2001).

### **2.8.1 Historical Performance of AFC**

AFC performed well in the initial three decades of existence reaching a peak in the mid-1980s with over 200,000 accounts held by 150,000 farmers (AFC, 2005). In the late 1980's AFC began to perform poorly in credit delivery due to: liberalization of agricultural sector, reduced support by government and development partners, and decline in agricultural terms of trade, frequent adverse weather conditions and poor governance. The liberalization of the agricultural sector and the subsequent collapse of most of the agricultural produce marketing bodies in 1989 dealt a heavy blow to AFC's loan programs. Farmers could no longer get reliable markets for their produce and more often than not, where such markets were available; the prices offered were way below the cost of production. Due to these factors, farmers' debt servicing capacities were affected. As a result, the corporation's loan portfolio dropped and arrears swore (AFC, 2009). The performance of the corporation in 1986 was the worst in its history compelling the government to write off loans in most of the branches, Machakos inclusive (AFC, 1986). The branch has been undergoing a downward trend in all performance parameters without any improvement. Compared to other worst performing branches in other regions, Machakos happens to be unique because it is the only branch in history that has continued to deteriorate in loan repayment performance (AFC, 2008). This is one of the reasons for taking the branch as case study. Table 2.1 shows the trend analysis of Machakos branch repayment performance.

The results of performance parameters depict a steady retrogression. This is given in average for every 3 years. The data were obtained from annual reports which are compiled at the end of every calendar year.

The trend reveals that politics has a negative influence on credit servicing. Politics affects the willingness of the clients to repay but not the ability. It is noteworthy, that the 1986 loan write off, which was a directive by the then president Daniel Toroitich Arap Moi,

made the branch to record the poorest performance in all indicators of performance, which had negative impact on repayment for many preceding years. The indicators also exhibit dismal performance patterns in electioneering and preceding years. For instance, between the years 1988-1989, 1992-1993, 1997-1998, 2002-2003, 2007-2008 and 2012-2013.

**Table 2.1: Loan Performance for Machakos Branch from 1983-2013**

Performance indicators	Average performance for 3-year period interval										
	1983-1985	1986-1988	1989-1991	1992-1994	1995-1997	1998-2000	2001-2003	2004-2006	2007-2009	2010-2012	2013-2015
Portfolio at risk	0.35	9.24	0.79	1.46	1.92	2.54	2.77	3.24	4.83	4.98	4.95
Arrears position	4.36	61.91	17.56	22.82	34.27	38.93	41.24	48.96	50.91	52.14	50.47
Delinquency rate	5.32	73.59	11.27	18.19	20.39	23.14	27.35	36.67	54.67	67.91	55.9

Source: AFC annual reports

### 2.8.2 Lending of AFC Loans

Finance is the lifeblood of any enterprise irrespective of its size. The primary objective of AFC is to assist in the development of agriculture and agricultural industries (Cap 323 of the laws of Kenya). The corporation makes different loans ranging from agribusiness, production and working capital loans. Most of loans given by AFC are for dairy, horticultural and large scale production of maize and wheat in Rift Valley (AFC, 2009). In the semi-arid areas, most of the farmers borrow loans for steers, sheep and goats for fattening. Others secure credit for agribusiness purposes which embrace trade in livestock or crop products, trade in inputs processing and value addition of agricultural output.

### 2.8.3 Repayment Performance of AFC Loans

The calculation of performance indicators is important to lenders, practitioners, and consultants to determine the efficiency, viability and outreach of agricultural credit facilities. The sustainability of AFC is important to ensure it continually provides

financing to farmers without depending on donors and government. Therefore financing is a prerequisite for making AFC services widely available. For the continuous provision of financial services to the poor farmers on a sustainable basis, the financial institutions must be viable and sustainable in themselves. Good repayment ensures that the corporation has money to lend to farmers and sustain its operations. The corporation must therefore ensure that clients repay their loans on time. Repayment rate of AFC loans in most of the branches in Kenya is good due to low rate of interest charged by the corporation and relending the clients who complete repayment without default. AFC is also flexible in lending which motivates farmers to diversify their agricultural activities hence motivation to service loans expeditiously. In Machakos Branch however, repayment rate is very low hence increasing the delinquency rate.

Table 2.2 shows the arrears position in percentage for the worst performing branch in each of the six regions of AFC. This depicts that Machakos Branch has the highest default rate in Kenya.

**Table 2.2: The average repayment (arrears) for the worst performing branch per region for the last 10 years**

Worst branch in the region	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Eastern Region- Machakos	48.2	48.5	49.1	49.2	49.9	51.4	51.3	51.6	51.8	53.1
Mt.Kenya Region- Nanyuki	23.5	23.6	23.8	23.9	24.8	25.7	24.1	24.2	23.9	22.8
Coast Region- Kilifi	18.8	18.9	18.9	18.2	18.9	23.1	23.2	18.0	16.4	14.8
Central Rift Region-Narok	44.4	44.2	44.0	44.8	45.6	49.8	51.3	50.9	53.1	55.0
North-Rift Region- Kapsabet	36.8	32.1	31.0	30.9	35.1	39.2	39.0	34.9	33.9	37.0
Nyanza/Western Region- Bungoma	22.0	20.1	23.1	21.1	29.7	33.9	44.9	44.0	51.6	53.0

**Source: AFC Annual reports and branch performance reports from 2003 – 2012**

#### **2.8.4 Role of MFIs compared to AFC in Poverty Alleviation**

The history of Microfinance dates back to about three decades when Mohammed Yunus founded the first one in 1976 in Bangladesh to offer financial assistance to poor women. He established the Grameen Bank which is a *Bengah* name meaning village (Karimi et al., 2003). Since their initiation, MFIs have made tremendous efforts toward reduction of poverty through the promotion of income earning activities among the poor. Kiiru (2006) asserts that the Kenyan micro-finance industry is a relatively new phenomenon, having begun with a few agencies about 20 years ago. Since then there has been a gradual shift in interest and resource allocation towards assisting the informal sector in Kenya in a variety of ways.

An overwhelming majority of the world's poor live in the third world countries. Various approaches have been employed in alleviating poverty, of which the provision of credit that targets the poor is one. Many are now of the opinion that allowing the poor to have command over resources through credit can contribute towards poverty alleviation. Kiteme (1992) argues that the best way to do something about poverty is to let the people do their own thing. Nobody will have more motivation to change his situation than the sufferer himself. Modern women groups' objectives now focus more on income-generating projects rather than solely welfare activities. They are multi-purpose and combine mutual financial assistance in the form of rotating credit associations to provide the means to pursue social, educational, and economic activities (Mbugua and Murithi, 1997).

According to the study by (Waweru et al., 2009) the lending procedure used by MFIs have been bound by AFC and other banks as an entry point through developing a very simple and unsecured procedure. Unlike in a bank, the terms and conditions of MFIs are many and rigid and as such the amount of loan disposable to the poor is less than that advanced by banks. Despite this fact MFIs are preferred by many rural members (Mugwanga et al., 1999). This is due to their widening base which facilitates access among the low income earners. AFC is able to attract more beneficiaries by offering affordable credit.

Njeru (2011) conducted a study on the nature of competition within the micro-finance industry in Kenya, which examined how lending organizations predicted loan default rates among its clients. The study concluded that government needs to put in place measures to reduce its public debt by supporting the private sector to make it more productive and in the process raise gross domestic product. This means that MFIs should be supported by government just like AFC is supported.

Loan delinquency has continued to cause serious challenge to most MFIs (Munene and Guyo, 2013). Note that a delayed instalment is said to be delinquent and a repayment that has not been made is said to be in default. Although AFC and MFIs target to alleviate

poverty through subsidized credit, this goal is far from being realized. Many lending institutions in Kenya are confronted by the challenge of rising nonperforming loan portfolios, which eventually end up as defaulted loans. Loan default will affect the MFIs' maximization of returns and portfolio growth (Ngahu and Wagoki). This effect is similar to that in AFC which has retarded the institutional growth.

### **2.8.5 The History and Performance of Group Loan in AFC**

The performance of group loans in AFC in the past was good, with a low default rate of 0.5%. However, according to Amwayi *et.al.* (2014), in the succeeding years the performance of group loans in some AFC branches such as Eldoret branch became very erratic recording a high of 80% default rate in 2008. The findings of the study suggest that the amount of loan has no effect on default; the size of the group has a significant positive effect on group loan default, while the age of the group, experience in borrowing and education level all produce significant negative effect on group loan default. These findings are useful in designing credit scoring systems by AFC and other lending institutions following the group lending model. The AFC started offering group credit to small farmers in Uasin Gishu County in 2006. By the beginning of 2007, the program had expanded more than twofold to include 96 farmer groups which received loans in excess of Kshs. 50 million, the beneficiaries being approximately 1,440 farmers. Currently, AFC Eldoret has financed 102 groups a total of over Kshs. 64 million. AFC requires the groups to sign a joint liability clause, which means that the group members are responsible for repayment of not just their own loans, but also loans taken by all members in their group. The primary purpose of AFC group loans is to enable those who do not own land, which is used as collateral, to access loans. The target groups are mainly women and the youth. However, the erratic performance of group loans in AFC calls for research on the causes of increased default rates in group loan schemes. Other mainstream privately owned financial institutions and banks have also adopted group loans model (Amwayi *et.al.*, 2014)

## **2.9 PRODUCTIVITY OF WOMEN**

Despite the outshining of men by women in debt serving performance, women in Kenya generally and particularly in Machakos County are less productive in agribusiness. This fact is concomitant to the study conducted by Arene and Kalu (1993) who suggested that the productivity of female farmers is low and encouraged the Nigerian Government to create incentives to enhance their productivity. According to the study, some of the incentives include access to land, female-oriented agricultural technologies and access to credit. Another study done by Arene and Omoregie (1991) recommended the strategy for agricultural development to consider the economic significance of raising the productivity of the female labour force and ensuring their equitable participation in the daily process of agricultural transformation. The specific needs of women should be prioritized and programs for achieving the above-mentioned objectives should focus at women to address a major national problem and the Nigerian food question.

## **2.10 IMPORTANCE OF EDUCATION IN LOAN REPAYMENT**

Nweke (1982) reported that education provides a favourable atmosphere for awareness of innovations. In addition, Sharada and Knight (2000) reported that schooling provides externality benefits by shifting the production frontier outwards and that education is important to the timing of adoption. Furthermore, the finding concurs with that of Ekoja (2004) who reported a significant difference among farmers in the adoption of innovations on account of educational qualification. The formal educational profile and farm training experiences of the farmers adequately exposed them to the importance of credit to farming operations. This has implications on their involvement in agricultural development activities such as the loan scheme since they can access information through print, electronic and professional associations meetings and workshops. In addition respondents' level of literacy can have positive effects on adoption of agricultural technologies and enhance ability to pay back loan within the stipulated payback period. This confirms the findings of Oladeebo and Oladeebo (2008) that level of education attained was one of the major factors that positively and significantly influenced loan repayment.



## **2.11 RESEARCH GAPS IDENTIFIED**

In Kenya most of the studies on credit default focus on Micro finance. Loans from Micro Financial Institutions mostly target small scale operators especially those based in rural areas. They also lend to small scale traders and *jua kali* operators in urban areas. Just like agricultural loans, the concern is to alleviate poverty and improve self-sufficiency among the rural populace. It is noteworthy that the default rate of agricultural loans in Kenya is an area of study which is less exploited. This is despite that agriculture is the mainstay of the economy and the need for paradigm shift from subsistence farming to agribusiness which is commercially oriented. This research study covers the agri-business sector and therefore fills in this gap.

Unlike in Kenya, most of other countries have documented Studies on default of agricultural loans. For instance, several studies have been done in Nigeria, Ghana and South Africa. In other parts of the world such as France, Spain, India, Bangladesh and Ethiopia, loan repayment of general commercial loans has been studied and little has been done on farm loans. The finding of this study will be documented and used to fill this gap.

Though this study will be used to fill in the above mentioned gaps, there are still other gaps that have been left out by the study for other researchers to explore. The study only focused on the servicing of the already given loan but did not focus on the motivations to apply for agricultural loans. The study was also limited to Machakos County and ignored Kitui County which also lies under the Machakos Branch. Other studies can also be carried out in the other branches. This does not mean that similar factors do not affect loan repayment but the impact or even the factors could be different.

## **2.12 CONCLUSION**

The review of literature is important because it relates studies done by various scholars in other areas with the current study. This shows the vital lessons that can be drawn to add to the body of knowledge. Past research is relevant because it lays the foundation for current research. Studies done worldwide have proved agricultural loan as an

indispensable input into any sustainable agribusiness. Irrespective of the scholar or area of study, default has been identified as a challenge which puts a consistent hindrance to efficient debt servicing. From the past records of AFC branch of Machakos, a declining trend has been registered in debt servicing.

## **CHAPTER THREE**

### **3. RESEARCH METHODOLOGY**

#### **3.1 INTRODUCTION**

This chapter provides the description of the area of study, the sampling design, the study population, the sampling methods and procedures, the source of data, data collection and procedures, data analysis and reporting.

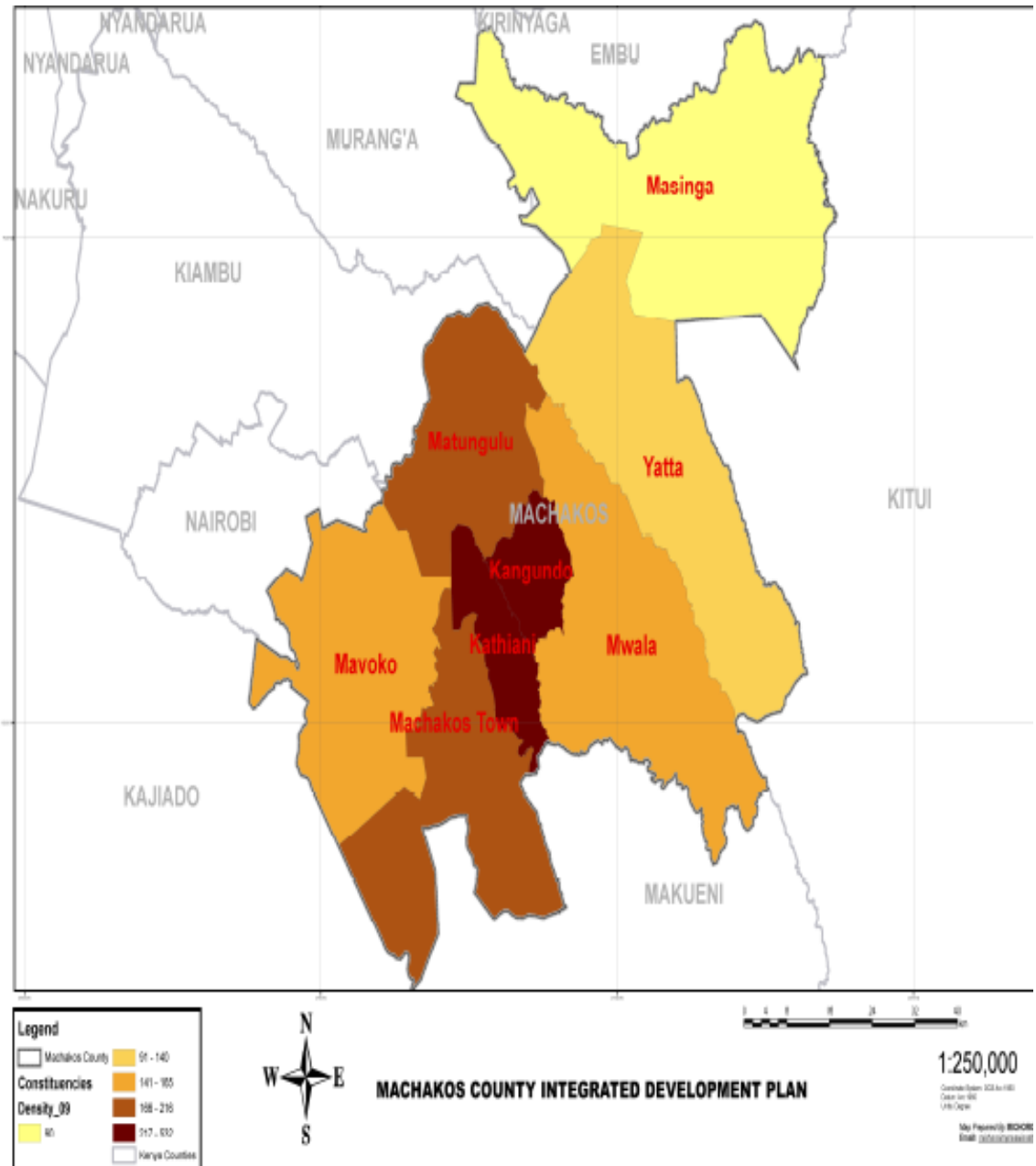
#### **3.2 DESCRIPTION OF THE STUDY AREA**

##### **3.2.1 Location and Size**

Machakos County is one of the forty seven Counties in Kenya and one of the eight Counties in the Eastern region. Machakos County is strategically located as it borders seven counties. To the north it is bordered by Embu, Muranga and Kiambu Counties, to the west Nairobi and Kajiado counties, to the south Makueni County and to the East Kitui County (IEBC, 2012). The County is divided into eight Sub Counties/ Constituencies namely; Masinga, Yatta, Kagundo, Matungulu, Kathiani, Mavoko, Machakos Town and Mwala (Figure 1). In terms of latitude and longitude it lies between latitudes 0°45' South and 1°31' South and longitudes 36°45' East and 37°45' East. The County covers an area of 6208.2 square kilometres with Machakos covering 925.2, Kangundo covers 177.2, Kathiani covering 207.1, Athi River covers 843.2, Yatta covering 1,057.3, Masinga covering 1,402.8, Matungulu covering 577.5 and Mwala covering 1,017.9 square kilometres (MCIDP, 2014).

Given the foregoing coverage it is apparent that Masinga, Yatta, Mwala and Machakos have the biggest area coverage respectively while Kangundo, Kathiani and Matungulu have the lowest coverage respectively. However to take note is the fact that the area coverage of the sub county does not necessarily determine the population density. For instance Kangundo, Kathiani and Matungulu have lowest area coverage while they are the highest population density. Mwala, Yatta, Masinga have a big area coverage yet they are not as densely populated as compared to Kangundo, Kathiani and Matungulu (MCIDP, 2014).

**Figure 1: Map of Machakos County**



### 3.2.2 Climate

The County receives a bimodal rainfall with short rains coming in October to December and long rains in March to May. The annual average rainfall ranges between 500 mm and 1300mm, and is unevenly distributed and unreliable. Total annual rainfall ranges from

1000 mm in highland areas to 500mm in the low lying areas. Temperature varies between 18°C and 29°C throughout the year. The coldest month is July and the warmest months are October and March prior to the onset of the rains. Dry periods are experienced in February to March and August to September. Agriculture contributes 70% of household income, rural self employment contributes 10%, and wage employment contributes 11 % while urban self employment contributes 5% (MCDP, 2013).

### **3.2.3 Physical and Topographic Features**

Machakos County has very unique physical and topographical features. Hills and a small plateau rising to 1800-2100m above sea level constitute the Central part of the County. To the West the County has a large plateau elevated to about 1700m which is southeast sloping. The County rises from 790 to 1594 m above sea level. In the North West the County has stand-alone hills (MCIDP, 2014).

The soils are well drained shallow, dark red clay soils particularly in the plains. However the vegetation across the entire County depends on the altitude of any given area/location. The rainfall distribution in the County depends on the topography of the areas. Since some areas of the County are arid while others have hills and volcanic soils and other areas are plains, the rainfall is widely distributed. For instance the plains receive less amounts of rainfall as such the dominant vegetation is grasslands and some sparse acacia trees. The areas within the county that are predominately plains include Mutituni and Mwala, while the hilly areas are Mua, Iveti Hills and Kathiani.

### **3.2.4 Ecological Conditions**

Machakos County is the home to some sections of Yatta plateau which is situated within the Yatta Sub-County which covers a land mass of 1,057 square kilometres and is thus the second biggest sub-county. Machakos County has numerous hills which include Iveti, Lukenya, Komarock, KavilaKoli, Ithanga, Mavoloni, Kangonde, Kamuthamba, Nzii, and Ekalakala. Tana River and Athi River are the two permanent rivers within the County. These rivers are the main sources of water, though we also have Masinga dam within

Masinga Sub-County which is the largest sub-county with a land mass of 1,402.8 square kilometres (MCDP, 2013).

### **3.2.5 Administrative Units**

The total land mass of Machakos County is divided into eight sub-counties/constituencies, namely, Athi River, Kathiani, Machakos, Matungulu, Yatta, Masinga, Mwala, and Kangundo. These eight sub-counties/ constituencies are further subdivided into twenty two divisions, seventy five locations and two hundred and thirty nine sub locations respectively. A comparison of the data in the above table, tells a story about Machakos County. It is apparent that Masinga is the Sub-County with the largest area coverage however it is not the Sub-County with the highest number of divisions, locations and sub locations (IEBC, 2012).

To note also is the fact that it does not have the highest population. Mwala Sub-County is the third largest sub-county; however it is the sub-county with the largest number of divisions, locations, sub locations, though it is the second in terms of population. Though Matungulu is the sixth in terms of area coverage, with three divisions, ten locations, thirty sub-locations, it is the sub-county with the largest population. An interpretation of the foregoing data means that the equitable distribution of resources shall be guided by the area coverage and population.

### **3.2.6 Demographic Features**

#### **3.2.6.1 Population size**

According to the (KPHC, 2009), the county has a population of 1,098,584. The Kenya National Bureau of Statistics (KNBS, 2013) has projected a total population growth of 1,238,650 by 2015 and 1,289,200 by 2017. The projected population growth is at approximately 1% over the years while the projected population growth of men is 1% more than women. The County has an average population of 188 per square kilometre. The average household size is 4 with a life expectancy of 65.5%. Absolute poverty is at a rate of 60.7% with a contribution of 4.7% to national poverty.

### **3.2.6.2 Population composition**

It is apparent that the gender population is almost equally distributed across the different age cohorts. The male population stands at 543,139 while the female population stands at 555,445. This translates into a sex ratio of 1:1.02. About 54% of the population ranges from the age of 15 to 59. This then means that the higher percentage of the County falls in the age bracket that can effectively work (KPHC, 2009). However, over 60% of this cohort is unable to work due to inadequate employment opportunities. According to (KPHC, 2009), the population composition of Machakos County is as follows:

**Under 1 year:** This population represents 2.68 per cent of the total population in the County.

**Pre – primary School Age (3 – 5 years):** This age group represents 13.31 per cent of the total County population.

**Primary School Age (6–13 years):** This age group has a population of 226,513, and it represents 20.62 per cent of the total County population.

**Secondary School Age (14–17 years):** The population of the secondary school going age was 101,497 pupils. This age group forms 9.2 per cent of the total population.

**Youth Age Group (15–29 years):** The population of the youth is 312,378 representing 32.4%. Most of the members of the group are in training for various courses.

**Reproductive Age Group (15–49 years):** The population of the reproductive age group is 272,423. This is approximately 24.8 per cent of the total population. This population has an impact on agribusiness since most of them crave for self employment and extra source of income in addition to their primary occupation.

**Labour Force (15–64 years):** The County labour force forms 56.15 per cent of the total population. The increase in labour force translates to the need to put strategies in place to ensure there is significant economic activity which will stimulate employment creation to absorb the growing labour force. One of the strategies that the County is looking at is establishment of industries aimed at value addition particularly for agricultural products.

**Aged Population (65 and above):** The population of those aged 65 and above is 54, 402 which are 5 per cent of the County's total population. This population has little contribution in agriculture due to reduced capacities to perform mentally and physically.

### **3.2.6.3 Population density and distribution**

The population density and distribution in the County is driven by the economic activity carried out in the specific sub county. As at 2009 the County had a population density of 177 per square kilometre. It was projected to increase to 188 as at 2012, then 200 as at 2015 and 212 per square kilometre as at 2017. Kangundo has the highest population density square kilometre, followed by Kathiani Constituency/ Sub County. The difference between population density square kilometre and Masinga which is the lowest is 442. This can be attributed to the fact that Kangundo has good agricultural and fertile soil as well as fertile soil which then acts as an attraction of populace while Masinga does not have favourable climate conditions conducive for agricultural activities (KPHC, 2009).

### **3.2.7 Political Units**

Machakos County is divided into eight Sub Counties/constituencies which are further broken down into Forty (40) County Assembly Wards. It is apparent that Machakos Constituency/Sub-County has the highest number of County assembly wards. However Masinga Sub County/ Constituency cover the largest area. This can be attributed to the fact that the population square kilometre is higher in Machakos than it is in Masinga. It can also be attributed to the fact that Machakos is a commercial hub and headquarter of the County. Machakos County has 445,866 registered voters against an eligible population of 543,829. This represents 81.99 per cent of the eligible voters. Mavoko Constituency/Sub County had the highest number of registered voters totalling to 80,164 which is 16% more than the eligible voters (IEBC, 2012).

This can be attributed to the fact that there is an influx of people into Mavoko because of the fact that it is a commercial hub that is the home to very many industries ranging from cement companies to those within the export promotion zone.

### **3.2.8 Financial Institutions**

Because of the fact that Machakos County has very many commercial activities, numerous banks and microfinance institutions have been attracted. Currently there are about ten (10) commercial banks, fourteen (14) microfinance institutions with branches



well distributed across the County and 1 branch of Agricultural Finance Corporation based at the county headquarters in Machakos. These banks and microfinance institutions include, Kenya Commercial Bank, Equity Bank, Cooperative Bank, Barclays Bank, Standard Chartered Bank, K-REP Bank, National Bank of Kenya, Faulu Kenya, Kenya Women Finance Trust Kenya, Post Bank, Family Bank, Small and micro enterprise programme (SMEP), three village banks and several Savings and Credit cooperative Societies (SACCOS) which include; Harambee Sacco, Hazina Sacco and Universal Traders Sacco (MCIDP, 2014).

### **3.2.9 Land and Land use**

Land has aesthetic, cultural and traditional values and is a vital factor of production in the economy. Land in the County is broadly used for Government forest, Government Reserve, Townships, Game Reserves, Agriculture, Ranches, Industrialization, mining and livestock keeping. The absence of the national land use policy has led to the proliferation of informal settlement, inadequate infrastructure services, congestion environmental degradation, unplanned urban centres, pressure on agricultural land and conflicts.

Out of the 6,028 square kilometres covered by the County, approximately 3,720.2 square kilometres is arable land while approximately 2,436 square kilometres is non-arable land and approximately 124 square kilometres is under water mass. Masinga Sub County has the highest water mass since it is the home of Masinga dam and the Seven Folks dam (KPHC, 2009).

According to KPHC ( 2009) proportion of land with title deeds stands at 28.5 per cent with the most affected area without title deeds issued being Athi River, Machakos and Kathiani. The impact of the lack of title deeds in these areas has resulted in the reduced investments despite the investment potentials vested in these areas. This has a strong bearing on access to farm loans which are issued by Agricultural Finance Corporation.

Because the propensity to engage in commercial activities as opposed to farming, the County has seen a consistent decline in arable land as farmers opt to engage in other

commercial activities while abandoning agriculture. The average farm size under small scale farming is 0.756 hectares while that under large scale farm is 10 hectares (MCIDP, 2014).

### **3.2.10 Economic activities in Machakos County**

- **Crop farming**

Since the County has quite a sizeable arable land, the main activity carried out in a number of sub counties is agriculture which is the main source of job creation. The main cash crops are coffee, French Beans, pineapples and Sorghum which are mainly grown in Kangundo Matungulu, Kathiani, Yatta and Mwala.

The County through the department responsible for agriculture seeks to increase the crops grown within the County as well as increasing the productivity of the arable land. The main food crops are maize, beans, Pigeon peas and cassava which are normally growing small scale. Most of the crops are rain fed and due to the unreliability of the rain there is low production leading to food insecurity.

To address the issue of unreliable rainfall, the County has set aside funds for the purchase of drilling rigs which will see to it that there are sufficient boreholes across the County. In addition the department responsible for water has prioritized the de-silting of dams and the construction of sand dams. The total arable land in the County is 372,020 hectares but only 248,333 hectares has been put under crop production. Total acreage of land under food crops in the County is 161,695 hectares while the total acreage under cash crops 86,638 hectares (MCDP, 2013).

- **Livestock rearing**

According to the (KPHC, 2009), the number of animals bred in the County was 230,891. These include: 126,608 Sheep, and 629,974 Goats. In addition, there are 862,592 indigenous Poultry, 4,026 Pigs, 21,336 Donkeys, 46,370 beehives and 20 Camels. There is growth in this sub-sector because of various government programmes to develop this sector and the ready market by the Kenya Meat Commission in Athi River. In addition

there are two livestock markets found in Masii and Masinga where farmers can sell their livestock. The County has made provisions within the budget to avail day old chicks to farmers. The department responsible for agriculture has given this priority.

- **Ranches**

There are thirty (30) ranches in the County categorized on basis of ownership of which two are company owned, three are group ranches while twenty five are individual ranches. Most of the ranches are in Machakos and Mavoko constituencies. The wildlife found here include; giraffe, lions, zebras, hyenas, buffaloes and antelopes.

- **Fish farming**

Though there are no large water bodies available within the County save for Masinga dam, fish farming was introduced to selected farmers within the County and the project has picked p well. However one of the main challenges has been the availability of market for the fish. These projects were under the economic stimulus program where 200 fish ponds where constructed in each Constituency/Sub County. The fish types reared in the fish ponds include mainly tilapia and mud fish although the catfish has been introduced to help in reduction of frogs' invasion in the fish ponds.

- **Forestry**

The forests cover an area of 477.617 square kilometres which is 7.6 per cent of the County's total land. The forests are categorized as gazetted and un-gazetted. The gazetted forest covers 606.97 hectares while the un-gazetted cover 1774 hectares. These forests are distributed in various parts of the County. The main forest products are firewood, charcoal, timber for building and construction, poles and posts. Other forest products include production of honey both for domestic and commercial purposes and wood carving in Wamunyu. Income generating activities from forestry include trees such eucalyptus, cypress, gravellie and pine for commercial purposes. Other activities include establishment of tree nurseries for seedlings (MCDP, 2013).

- **Fruit farming**

Fruit trees are also grown and include mangoes, papaws, avocadoes, Guavas and oranges for both income generation and consumption. This is particularly common in the agricultural areas such as Mwala, Masii, Yatta and Kathiani. The proximity of the County to Nairobi and Jomo Kenyatta International Airport (JKIA) has stimulated the growth of fruit growing in the County. Grafted fruit trees that produce grapes, straw berry, mangoes, and oranges have been planted. The County produces enough fruits for domestic use and surplus for export to Nairobi. Fruit farming is practiced in all the constituencies in the County except Mavoko Constituency/Sub-County.

- **Animal feeds production ventures**

The fact that the increase of livestock in the county highly depends on the availability of animal feed is an indication of the priority given to the production of the same.

Some of the plant fodder trees which various National Government agencies had already recommended to the farmers to grow include *Calleindra*, *Sesbania sesban*, *Leucaena leucacephella*. The County government will continue to increase the production of these plant fodders through encouraging the farmers to plant them.

- **Growing and processing for medicinal purposes/value plants and products**

Since time immemorial, the communities' resident within the County have always relied on different medicinal plant to treat different diseases. Some of these medicinal plants are *neem* tree and *Moringa oleifera*. These communities would use the leaves, the stem or the bark of the medicinal tree to get the intended results. The County is keen to identify from these different parts of the medicinal trees the specific active ingredient in them that makes them medicinal. In view of this the County will promote cooperation with other institutions and agencies to conduct research so as to promote the growth and processing in order to promote their use. This will lead to the development of research centres in the County.

- **Mining**

The County is well endowed with mineral resources that are a valuable input to the building and construction industries. The large deposits of sand, limestone and granite have attracted all the major cement factories in Kenya including Bamburi, East Africa Portland, Mombasa Cement, Simba Cement and Savanna to Athi River where these minerals are found.

- **Tourism**

The County has a number of tourist attraction sites which have not been exploited due to poor road networks, and inadequate funding. The major tourist attractions include Ol Donyo Sabuku National Park, Iveti hills scenery, Kyamilu gravitational defying area and the wood carving in Wamunyu. The County is home to various animals which are in and outside the park.

The main wildlife include , Zebra, Wildebeest, Eland, Giraffes, Thomson's Gazelle, Grant Gazelle, Elephants ,Buffalo, Waterbuck, Lion, Cheetah, Leopard, Warthogs, Ostriches, Impalas, Dik Dik, Hyena, and Reedbucks. Tourist class hotels found in the County include Garden hotel, Tea Tot hotel, Maanzoni lodge, Lysak Haven Park hotel, Lukenya Get Way, Dallas Hotel, and Masinga Dam Resort, The bed capacity ranges from 200 to 300. The County also has many boarding and lodgings in the major towns.

- **Industry**

The County has 114 manufacturing industries mostly in Mavoko Constituency/Sub County. They include Mabati Rolling Mills, Kenya Meat Commission, Agrichem & Tools Ltd, Athi River Steel plant, EAPCC, Bamburi Cement, Mombasa Cement, Savannah Cement, Simba Cement, Primarosa, Kenya Meat Commission among others. They provide ready market for the large mineral deposits such as limestone, ballast and sand found in the County. The number of industries is bound to increase drastically because of the New Machakos City which will be set up as well as the Investment Program that will be launched in the course of the year (MCIDP, 2014).

- **Employment**

Currently the wage employment (formal) constitutes of only 11 per cent of the total number of people who can be employed. Most of the wage earners are casual labourers working in the construction industry and the farms. The labour force (the population of the people willing and able to work) stands at 654,967 which is 56.15 per cent of the total County population (MCDP, 2013).

With the steady growth of the labour force, there will be a major challenge of creating employment opportunities in the County. Other residents have opted to engage in self employment due to the scarcity of formal jobs. Most residents living in the rural areas within the County engage in agricultural activities some of them in terms of small scale farming or large scale farming, while those living in the urban centre engage in small businesses.

The national government has to date sought to enhance self-employment and has put in place the Youth fund and Women funds has given out soft loans to the youth and women groups and other self-help groups to assist them in starting small businesses. The unemployment rate in the County is high at approximately 52 per cent. There is a mismatch between the population growth which is estimated at 2 per cent, and the rate of job creation (MCIDP, 2014).

This situation is likely to cause discontent in the County as most those unemployed are youth, who are likely to engage in unproductive behaviour. The high rate of unemployment is attributed to low absorption rate in the agriculture and commercial sectors and preference for white colour jobs by the youth.

### **3.2.11 Water Resources**

Water resources in the County are under pressure from agricultural chemicals and urban and industrial wastes, as well as from use for hydroelectric power. The County has two permanent rivers namely Athi and Tana. Tana River is mainly used for hydroelectricity generation while Athi River is used for domestic and industrial uses. There are also

several dams that serve as water resources and springs which are found in the hilly areas. Underground water sources supplement surface water sources.

There are established water supply schemes in every sub-County of the County. There are three water supply schemes in the County, Kayata in Matungulu, Yatta, and Kabaa in Mwala. There are various community management committees in various water catchments areas in the County. They help in protection of water catchments areas.

The main water sources are rivers, dams and boreholes. The average distance to the nearest water source in the County is 5Km. Fetching of water is mainly done by women especially in the rural areas who end up spending so much of man-hours on this activity (MCDP, 2013).

### **3.3 SAMPLING DESIGN**

The population of study was farmers benefitting from AFC loans in Machakos County. A population is also called a “universe” and refers to all the items in the field of inquiry (Kumar, 2008). From the branch reports, there were 701 clients in Machakos County. A sampling frame was prepared by arranging the farmers in the order of their loan sizes. It is important to select a representative sample through making a sampling frame because this technique produces a clear estimate from the overall population parameter with greater precision and ensures a more representative sample is derived from a relatively homogeneous population (Babbie, 2010).

A total of 100 farmers who were credit beneficiaries of AFC from the county were randomly selected through systematic random sampling technique. This sample size was adopted because any sample size of 30 or above is a large sample and would enable statistical inferences to be made about the population. Besides, time and financial outlays available could only enable such a sample size to be studied.

The names of 701 clients from the county list were arranged in a descending order depending on the size of the loan that the client had been given. A sampling interval of 7,

which is the sample size of 100 farmers selected divided by the total population size of 701 beneficiaries, was used. A random start point was established and the interval of 7 was used to pick every 7<sup>th</sup> name in a successive manner. The constant interval between the samples which was taken reduced bias because the names were not arranged according to the order of arrears but depending on the size of the loan given.

### **3.4 DATA COLLECTION**

#### **3.4.1 Types and Source of Data**

There are two major types of data: primary data, which are information gathered directly from the source for the purposes of the study; and secondary data, which are information gathered from the published work of other authors, previous reports (unpublished and published), peer review journals, books, and magazines (Wilson, 2010). Primary data were obtained from the respondents who were farmers benefitting from AFC loan while secondary data were sourced from AFC data base and published works. Secondary data are important because they act as a support arm of the primary data; they provide background information on the research topic and serve as a check and standard for evaluating primary data. Secondary sources of data that were used in this research include articles, journals, magazines, AFC manuals and reports, published financial statements and the internet.

#### **3.4.2 Data Collection Instrument**

This study utilized a questionnaire as a tool for primary data collection. A questionnaire is a schedule of various questions intended for self-completion by survey participants (Brace, 2008). A questionnaire is an effective method for acquiring information especially from a large or sparsely located group of respondents. The questionnaire design in this study comprised four sections (A to D). Structured questions were used in an effort to save time and money and facilitate the analysis as they were in immediate usable form. This is because unstructured questions would encourage the respondents to give an in-depth and felt response without feeling held back in revealing of any information.



### **3.4.3 Pre-Testing**

Before the research tool was administered to participants, pre-testing was carried out to ensure that the questions were relevant, clearly understandable and sensible. The pre-testing aims at determining the reliability of the research tool including the wording, structure and sequence of the questions. Pre-testing involved 20 respondents from the target population. The respondents were conveniently selected since statistical conditions were not necessary in the pilot study. The purpose was to refine the tool so that respondents in the major study would have no problem in answering the questions. Expert opinion was requested to comment on the representativeness and suitability of questions and gave suggestions of corrections to be made to the structure of the research tool. This helped to improve the content, validity and reliability of the data that would be collected.

### **3.4.4 Data Collection Procedure**

Data for the study were collected by administering a questionnaire. The researcher informed the respondents that the instruments being administered were for research purposes only and the responses from the respondents would be kept confidential. The researcher obtained an introductory letter from the university to collect data from farmers. Selected farmers were telephoned to inform and request them to suggest how the questionnaire would reach them. Some farmers preferred to collect the questionnaire from the AFC office; others wanted it mailed (either manually or electronically); while the rest asked the researcher to personally deliver the questionnaire to the areas of their convenience. Farmers with low levels of education were guided on how to answer questions. For the educated farmers; ‘drop-and-pick-later’ method was adopted.

### **3.4.5 Ethical Considerations**

The researcher sought permission from relevant institutions before commencing the study. These institutions include AFC and the Ministry of Agriculture. This was meant to inform these institutions the purpose of the study. Respondents were assured that the study was meant for academic purposes only and that their responses would be treated with utmost confidentiality. Also, due to the sensitivity of some of the information

collected, the researcher held a moral obligation to treat the information with utmost propriety.

### **3.5 DATA ANALYSIS AND REPORTING**

Data analysis was carried out to understand the extent to which particular variables influenced debt servicing capacity. The analysis was done by descriptive statistics and regression using the Statistical Packages for the Social Sciences (SPSS V. 20.0) computer software.

#### **3.5.1 Data Analysis Methods**

The type of data analysis tool that is used by researchers is dependent on the type of the data; that is whether qualitative or quantitative (Walsh and Wiggins, 2003). To analyze quantitative data, frequency tables and statistical software packages can be used (Wilson, 2010). The qualitative data takes an exploratory or conceptual context analysis process which is more ideal as the information gathered from the open ended questions which are large and can be time consuming if not well planned (Wilson, 2010).

#### **3.5.2 Descriptive Statistics**

These provided an in-depth explanation on how certain variables influenced loan servicing. The effect was compared with past studies that are related to the field of study. A comparison of data from defaulting loan beneficiaries was made through percentages and means. The likely reason for direction and magnitude of each variable was clearly explained. Data presentation was done using tables derived by cross-tabulating each variable with the compliance level of the borrower.

#### **3.5.3 Regression Analysis**

Binary logistic regression method was used to establish the direction of influence and significance level of each variable considered. The logistic model helped to determine the factors that influenced loan repayment by farmers in Machakos County who were beneficiaries of AFC loan. The general regression model can be presented as follows:

$$Y_i = \alpha + \beta_1 \chi_{i1} + \beta_2 \chi_{i2} + \beta_3 \chi_{i3} + \dots + \beta_n \chi_{in} + e_i$$

Where

$Y_i$  = Compliance in loan repayment  $i^{\text{th}}$  farmer

$\alpha$  = Constant term

$e_i$  = Error term representing the  $i^{\text{th}}$  farmer

$\beta_1, \beta_2, \beta_3, \dots, \beta_n$  = Regression coefficients

$\chi_{i1}, \chi_{i2}, \chi_{i3} \dots \chi_{in}$  = Independent variables for the ifarm

The specific regression model can therefore be represented by:

$$y = \alpha + \beta_1 G + \beta_2 A + \beta_3 OC + \beta_4 OFI + \beta_5 AE + \beta_6 FE + \beta_7 CE + \beta_8 MB + \beta_9 FV + \beta_{10} S + e$$

Where:

Y= Compliance or default in debt repayment (1=compliance, 0=default)

G = Gender of the respondent (male = 0, female = 1)

A = Age of the applicant (years)

OC = Occupation of the beneficiary

OFI = Off-farm income activities

AE= Number of agribusiness enterprises

FE= Farming experience (years)

CE= Credit use experience (number of borrowings)

MB= Multiple borrowing

FV = Farm visit

S= Supervision

$\alpha$ = Constant term

$\beta$ s = Regression coefficients

$e$  = Error term

### **3.6 CONCLUSION**

The essence of research methodology is to determine the quality of data available for analysis. The study would only be possible to carry out if relevant tools and approach were employed. The approach employed in data collection determines the accuracy of the results. In this study, systematic random sampling design was used in order to select the sample of 100 clients from a population of 701 farmers who hail from Machakos zone of AFC Machakos branch located in Machakos County. A questionnaire was used for collection of data. To ensure questions were understandable and sensible, pre-testing was done. All these efforts were geared towards achieving the desired results which can be recommended to various stakeholders for sustainable credit programs, not only in Machakos County but also in other areas of the country and the whole world in general.

## **CHAPTER FOUR**

### **4. DATA ANALYSIS, RESULTS AND DISCUSSION**

#### **4.1 INTRODUCTION**

This section presents the results and discussions from both descriptive and regression analyses. Data analysis was carried out to understand the extent to which particular variables influenced the debt servicing capacity of farm loan beneficiaries in Machakos County whose credit was approved by AFC.

#### **4.2 DESCRIPTIVE ANALYSIS**

This method of data analysis provides an indication of how certain variables influenced loan servicing in the area of study. The relationship of each variable was compared with past studies that are similar to the current study. A comparison of the results from defaulting loan beneficiaries was made through percentages and means. Data presentation was done using tables that were derived by cross-tabulating each variable with the compliance level of the borrower. The variables analyzed include gender, age, education, off farm income, credit experience, farming experience, funds use, supervision, farm visits, occupation, political environment, adoption of technology, agricultural diversification, loan making efficiency, suitability of loan scheme and land dynamics. A discussion of each of the variables is provided in the following sections.

##### **4.2.1 Gender of the Respondent**

Gender plays a critical role in loan repayment. This is because it defines the role played in the household, the seriousness in implementing the project and the protection functions. Studies conducted worldwide have shown that gender influences the success of loan servicing and that female borrowers outperform male borrowers in a consistent manner as far as loan repayment performance is concerned. Table 4.1 presents the results of the influence of gender on debt servicing performance of the borrower. The table shows that the majority of loan beneficiaries were men (86%) compared to women (14%). This implies that few women possess collateral such as the land title deed, which

is the principal security attached to AFC loans. Besides, the area of study is a patriarchal society where men control most of the commercial undertakings. According to Yegon *et al.* (2013), the contribution of women is largely in domestic chores and subsistence farming. Furthermore, women are naturally risk averse which makes them fear applying for farm loans. This finding conforms to the work of Awunyo-Vitor and Wongnaa (2013), who studied loan repayment performance among yam farmers in Sene District, Ghana. The sample had 93% male yam farmers. Few females in the district took yam farming as their business and a source of employment. Besides, Ojiako and Ogbukwa (2012) studied the economic analysis of loan repayment capacity of smallholder cooperative farmers in Yewa North Local Government Area of Ogun State, Nigeria. The study found out that the majority of respondents who borrowed loans were male comprising 91.8% while the remaining 8.2% were females.

**Table 4.1: Distribution of loan repayment status based on gender of the client**

Gender of client	Borrowers' compliance*			Default rate	Compliance rate
	Default	Compliance	Total		
Male	33	53	86	38.4	61.6
Female	4	10	14	28.6	71.4
Total	37	63	100		

**\*Figures in the table also represent percentages**

From Table 4.1, the default rate for males was 38.4% compared to 28.6% of the females. The likely explanation for the lower loan default rate among females is that females are more financially disciplined and prioritize the use of loans on the actual projects they borrowed for; they fear the shame associated with failure of projects under their responsibility and debt recovery measures; and expend their efficient concentration span to discharge their efforts in implementation of the proposed projects. In contrast, males tend to see borrowed money as free money and divert it to other projects that were not initially planned. Men also have a tendency to neglect the intended projects and leave responsibility and management to other people while they roam around. For example, the males who defaulted in the current study had married more wives and joined drinking clubs. This finding contradicts the conventional expectation because men are known to be

more likely to take risky decisions (Roslan and Karim, 2009). Men also tend to get information about new technologies rapidly as compared to women. Men have more access to formal credit than female farmers (Omonona *et al.*, 2010). This is attributed to their ownership of larger farm sizes and better commercial orientation which can lead to higher loan repayment rates.

Studies from different parts of the world show that women repay their loans better than men. For instance, Awunyo-Vitor and Wongnaa (2013) found that male yam farmers defaulted by 18.4% more than their female counterparts. He attributed the higher loan repayment performance in women to discipline in ensuring that production resources given to them are used for their intended purposes. Similarly in Malawi, Hulme (1991) reported 8% default rate in women compared to 17% in men. Also, Hossain (1988), in a study conducted in Bangladesh, showed that 81% of women repaid their loans well compared to 74% of men.

#### **4.2.2 Age of the Borrower**

The impact of age on loan servicing performance is crucial. This is because the number of years the client has lived may be a reflection of the experience, wealth status, energy level, attitude, mental outlook and general social interaction. Table 4.2 reveals the results of the influence of age on the borrowers' debt servicing capacity in the study area. The table indicates that as the age advances, more farmers plunge into credit repayment challenges. From the results, a minority of the respondents (14%) were aged less than 40 years. The group is the most energetic and productive comprising the active working population. This age group is classified as the youth (Akangbe, 2003). The likely explanation for the minority borrowers is that agribusiness is less attractive to the youth in the county. Few young people are left in the countryside while the rest move to towns to look for white-collar jobs or undertake commercial enterprises in major towns. On the other hand, this age group has little wealth to buy land to use as collateral to secure farm loan. In addition, many young people tend to concentrate on occupations that give them income at that particular moment. These findings conform to that of Oke *et al.* (2007) who opined that young small holder farmers were not many among rural dwellers due to

migration of the youths to the urban centres in search of white collar jobs and better social lives.

**Table 4.2: Distribution of loan repayment status based on the age of the borrower**

Age groups of respondents	Borrowers' compliance*				
	Default	Compliance	Total	Default rate	Compliance rate
Less than 40 years	2	12	14	14.3	85.7
40-60 years	21	43	64	32.8	67.2
Above 60 years	14	8	22	63.6	36.4
Total	37	63	100		

**\*Figures in the table also represent percentages**

Farmers in the age bracket of 40-60 years were 64% of the total respondents. The results concur with the growing evidence of ageing farming population in most rural areas (Akpan, 2010). This is the age bracket where majority have interest in farming business. They have large farm sizes and earnings compared to young or older farmers. This constitutes the working and the retired people. The likely explanation for majority of farmers being in this group is that the group has more collateral capabilities than the youth. Besides, these borrowers have more family commitments and as such they utilize all the available opportunities in order to boost their income. Moreover, most of them are settled irrespective of their professions.

The borrowers aged above 60 years constituted 22% of the respondents. The majority in this category were retirees with limited physical and mental capacity to do work. They may also have spent accumulated wealth to meet the family commitments such as education. Some still were dependants who relied on their children for financial needs. This is because as farmers' ages increase, their ability to engage in active farming reduces, making them to depend more on hired labour, thus reducing net farm income and the ability to repay loan.



On loan repayment, the default rate was found to increase with age. The least default rate of 14.3% was noted among farmers aged less than 40 years while the highest default rate (63.6%) was noted for clients aged 60 years and above. The likely reason is that young farmers are productive because they have physical and mental capabilities to contribute to the growth of the project. They can take risk and are dynamic and independent. Youths are also bold and inventive. From the current study, youths were found to have young families, which were easier to maintain. They also had one or more projects to take care of and tended to concentrate more on the current projects. In this case, it was hard to divert money, thus increasing income and subsequently loan servicing.

Old farmers aged more than 60 years rely on relatives and employees to manage their projects. At the same time they are too conservative, making it difficult for them to embrace new ideas. Borrowers in this age bracket had a tendency to do many projects, which were not well managed, and this created avenues for loan diversion. Most of these farmers had few resources given the fact that they had sold the wealth they had accumulated over their productive years in order to meet the educational and basic needs of their families.

Studies from other researchers indicate that age variations had a great influence on debt servicing capacity of borrowers. For example, Awunyo-Vitor and Wongnaa (2013) found that age had a positive influence on debt servicing. According to his results, addition of one more year to a yam farmer's age increased loan repayment performance by 2.77%, which means that older farmers had better loan repayment capacities than younger farmers. This could be due to the many years of yam farming experience and wisdom that has been accumulated by these older counterparts. Similar results were reported by Ojiako and Ogbukwa (2012). These results contradict that of Ayanda and Ogunsekan (2012) who investigated the farmers' perception on loan repayments obtained from Bank of Agriculture in Ogun State of Nigeria. Their findings revealed that 45.8% of the loan borrowers were between 31-40 years of age while 36.7% of them were between 41-50 years of age. The mean age of the respondents was 39.36 years. The study established a negative relationship between the age of the farmers and loan repayment.

### **4.2.3 Education Level of the Borrower**

Formal education is an important predictor of good loan repayment. Education level is important for efficient debt servicing. Education is an input that facilitates the adoption of new technologies. According to studies done in various parts of the world, education affects loan repayment performance in different ways. From the current table, borrowers with higher levels of education had a better repayment performance because they were able to respond to improved technologies and innovations that enhanced better returns from their farm investments. This finding implies that farmers who were defaulters had the lowest education levels of education.

Table 4.3 gives the findings of influence that education levels had on loan repayment in the area of study. From the table, 51% of the respondents had attained primary and secondary education (lowest level) while 1% had highest levels of education of master's and doctorate degrees respectively. These results conform to those of Bichanga and Aseyo (2013) who reported on loan default within Micro Financial Institutions (MFIs) in Kenya. They found out that 59% of the respondents from the MFIs had secondary certificate and 1% had doctorate degree. This study has established that repayment performance increases with an increase in education levels. Borrowers with basic education had the highest default rate of 43.1% while those with the highest level of education had no defaults in debt servicing. The likely reason is that educated farmers can easily and quickly learn how to use modern farm technology which benefits them, leading to better loan repayment performance. Besides, educated farmers make prompt repayments in order to enhance their credit worthiness. Furthermore, their repayment performance is enhanced by access to off farm income opportunities.

Drawing evidence from researchers in different parts of the world, education is an important determinant of loan default. For instance, Olomola (1999) found a negative relationship between education and loan repayment. According to him, educated individuals have better chances of securing white collar jobs. Thus, they move to various places in search of better job opportunities. This implies that it is risky for lenders to finance them. They also relocate more frequently meaning that they are unlikely to have a

reputation within the community. This makes them less attractive to lenders and even social groups that collectively come together to make savings and obtain bank credit facilities.

**Table 4.3: Distribution of loan repayment status based on education level of the client**

Education levels of borrowers	Borrowers' compliance*				
	Default	Compliance	Total	Default rate	Compliance rate
Basic= primary and secondary	22	29	51	43.1	56.9
Middle level training= certificate and diploma	11	21	32	34.4	62.6
Bachelor's degree	4	11	15	26.7	73.3
Master's degree	0	1	1	0	100
PhD degree	0	1	1	0	100
Total	37	63	100		

\*Figures in the table also represent percentages

However, majority of the researchers have found education to be an important determinant of loan repayment. An example is a study done by Sileshi *et al.* (2012) on the factors affecting loan repayment performance of smallholder farmers in East Hararghe, Ethiopia. The study found out that an educated farmer is better-off and is able to use modern agricultural technologies, perform farming activities based on cropping calendar, and manage resources properly. All these factors boost production, thereby enhancing loan repayment. From this study, 30.7% of the household heads who were more educated only registered 23% of defaulters. Mashatola and Darroch (2003) investigated the factors affecting loan status of sugar-cane farmers using a graduated mortgage loan repayment scheme in Kwa Zulu-Natal, South Africa. They found out that growers with higher levels of education were adopting technologies such as ripening and heat treated seed-cane, and were able to engage consultants for advice in areas in which they felt their skills were deficient. Educated growers were able to work out the cost: benefit analysis of use of technology and consultation. If there were more benefits than costs they were more likely to repay their loans.

Ibrahim and Bauer (2013) studied access to micro credit and its impact on farm profit among rural farmers in the dry land of Sudan. Their study reported that the average education level for credit users was 6.8 years of formal schooling. They further observed that farmers who attained more than six years of formal education were able to communicate and interpret business information better than those who had lower education levels or none.

#### **4.2.4 Off Farm Income**

Off farm income influences loan repayment. It provides additional liquidity to fund future operations and debt repayments. It refers to access to liquid assets which might be required to provide investment in various economic activities. It is the secondary source of income other than farming and is measured as the amount of income the household received from various activities such as salaried work, local trade and wage earnings. It forms additional sources of income, which is a backup to improve debt servicing capacity. Table 4.4 shows the comparison in performance of respondents based on off farm income.

Results in Table 4.4 indicate that off farm income had a positive relationship to debt servicing. A majority of the borrowers (86%) in the study area had off farm income. These sources of off farm income included employment and formal businesses. The default rate for clients with off farm income was 34.9% compared to 50% for borrowers without access to off farm income. Farmers with additional income registered less default. This finding is similar to those of Barry *et al.* (1995) which posit that off farm earnings enable farmers to alleviate on-farm liquidity constraints. The interpretation for this is that Machakos, being a semi-arid area, has intermittent bad weather. This exposes the farmers to the risk of project failure. If the project failed for a farmer who had off farm income, he could still repay the debt as opposed to a farmer with no off farm income.

**Table 4.4: Distribution of loan repayment based on off farm income**

Availability of extra source of income	Borrowers' compliance*			Default rate	Compliance rate
	Default	Compliance	Total		
With off farm income	30	56	86	34.9	65.1
Without off farm income	7	7	14	50	50
Total	37	63	100		

**\*Figures in the table also represent percentages**

The results concur with the findings of Lyne and Ortmann (1992) who reported that small-scale farmers in the former Kwa Zulu homeland who had higher levels of off farm income and who rented in more farmland from other households were more likely to repay seasonal (working capital) loans well. The other reason why farmers with off farm income register better repayment is that they are more likely to invest in necessary technology and hence get better financial channels which enhance their debt servicing capacity.

Many researchers have established that off farm income relates positively with debt repayment performance. An example is the study by Mashatola and Darroch (2003), which established that access to a substantive amount of off farm income increases the probability of farmers being compliant on loan repayment. They attributed this outcome to the fact that farmers with off farm income rely less on drawings from the farm to finance family expenditure and/or to supplement their limited farm income in low income periods (e.g. drought years). Introduction of off farm income into the farm business or family expenditure when there are liquidity problems also can assist farmers in staying current on loan repayments. Access to off farm income is often considered criteria for selecting potential farmers for such loan schemes, as it helps to provide additional liquidity to fund future operations and debt repayments. The study found that 30% of the respondents had no off farm income out of which a majority (79%) were defaulters. Besides, Briggeman (2010) carried out research in the United States of America on debt income and farm financial stress. He found that farm income alone was not sufficient to service the debt. He further established that in 2008, 90% of farming household income

came from off farm activities. By supplementing their income with off farm sources, many farmers had ample debt repayment capacity.

The study by Sileshi *et al.* (2012) established that non-defaulters obtained more cash from crops, livestock and off farm (11843.8Birr) than defaulters (9596.4 Birr). From the results, 48.6% of the respondents reported that at least one of their family members was engaged in off farm activities, which enabled them to earn additional income. A larger proportion of non-defaulter households (75%) sent their members to off-farm activities than that of the defaulter households (38%). Participation in off farm activities increased the probability of non-default by 13.8% and on average it increased the rate of loan repayment by 7.7% for the respondents. This is because additional income enabled the farmers to settle their debt even during bad seasons and periods of low agricultural prices.

#### **4.2.5 Experience in Credit Use**

Experience in credit use prepares the minds of borrowers that they have a financial obligation to meet in servicing the debt. It is measured by the number of times the borrower has taken credit. The frequency of credit use has been found by many studies to influence debt servicing. Table 4.5 reveals the relationship between experience in credit use and loan repayment. The findings in the table show that default rate reduced with the frequency of borrowing. From the current study, clients who had borrowed once registered a default rate of 58.8% while clients who had borrowed four times and above recorded the least default rate of 21.9%. The explanation for the difference in default rate is that repeat borrowers were more acquainted with credit application. Efficient and effective use of credit enhances farm income, which improves the debt servicing capacity. The other reason is that repeat borrowers wanted to protect their images and remain credit worthy so as to enable them to be graduated to the next higher loan in future. Repeat borrowers of AFC loan in the area of study were appraised based on repayment performance history. Repayment was found to improve with the frequency of taking a loan from a financial institution.

**Table 4.5: Distribution of loan repayment status based on experience in borrowing**

Number of borrowings from all sources	Borrowers' compliance*			Default rate	Compliance rate
	Default	Compliance	Total		
Single borrowing	10	7	17	58.8	41.2
Double borrowing	11	13	24	45.8	54.2
Triple borrowing	9	18	27	33.3	66.7
Above four times	7	25	32	21.9	78.1
Total	37	63	100		

\*Figures in the table also represent percentages

Other studies that have confirmed the relationship between credit use and default rate include a study by Sileshi *et al.* (2012) which established that the number of years of formal credit experience of a household head was 3.3 years. Defaulters had an average of 3.1 years while non-defaulters had an average of 4.1 years. Another example is a study by Abafita (2003) that found that if a client was a repeat borrower he may have acquired more experience on the institution's rules and regulations, and hence could efficiently utilize the loan for the intended purpose.

#### 4.2.6 Farming Experience

Farming experience is crucial to loan repayment performance. This is because it enhances production, boosts farm income and facilitates debt repayment. The results of various studies have established that farmers with more years of farming outperform those with less experience in debt servicing.

The results of loan repayment performance based on farming experience are presented in Table 4.6. The findings show that farming experience was positively related to debt servicing abilities. Default rate was found to decrease with the level of experience in farming. Farmers with an experience of less than 5 years had a default rate of 72%, while those with over 15 years of experience defaulted by 15.8%. This is because farming experience leads to proper utilization of agricultural loans and inputs, which in turn has a positive effect on the magnitude of farm profit and consequently loan repayment ability. Besides, experience influences the farmer's knowledge on the practices which may work

or not, thus reducing enterprise failure. In fact, experience brings about stability in farming activities and reduces the risks associated with agricultural projects. This ensures that agribusiness is a going concern, the sustainability of which enhances credit servicing.

**Table 4.6: Distribution of loan repayment status based on experience in farming**

Farming experience in years	Borrowers' compliance*				
	Default	Compliance	Total	Default rate	Compliance rate
Below 5 years	18	7	25	72	28
More than 5- 10 years	11	19	30	36.7	63.3
More than 10- 15 years	5	21	26	19.2	80.8
Above 15 years	3	16	19	15.8	84.2
Total	37	63	100		

**\*Figures in the table also represent percentages**

Researchers in different parts of the world have confirmed that farming experience has an effect on loan repayment performance. For example, Okpara *et al.* (2013) investigated the determinants of loan size and repayment performance of small oil producers in Abia State, Nigeria. According to the study, farming experience was positively related to loan repayment. The reason for this may be attributed to improvement in managerial skill, which induces the need for more financial resources to further enhance profitability and in turn enhance the repayment performance. The number of years a borrower has been in the business of oil palm farming and processing gives an indication of the practical knowledge he has gained on how to overcome operational difficulties at minimum cost. This reflected the profitability level and enhanced the ability to repay the loan.

The study by Mashatola and Darroch (2003) established that the years of farming experience was related to loan repayment performance. Borrowers who had been in sugarcane farming for many years could adapt to the challenge of managing a commercial sugarcane farm. Growers with more experience, therefore, could manage their farm operations better than those with less or no farming experience. The



respondents had 2 to 36 years of experience in sugarcane farming and an average of 13 years.

#### 4.2.7 Funds Usage in the Agricultural Project

Loan diversion is a great problem to efficient debt servicing. In this case borrowed funds are used for other purposes other than the intended use. The hidden use is not known by the financier but only by the borrower. Studies conducted by different scholars have established an inverse relationship between credit diversion and loan repayment performance.

Table 4.7 shows loan servicing performance based on use of funds in the project. According to the results there was an inverse relationship between loan diversion and repayment rate. Borrowers' failure to implement the proposed project undermines the debt-servicing capacity. From the current study, 66% of the clients did not use the funds for project implementation as earlier planned while only 34% used the funds as they had indicated in the application forms. A high rate of diversion can be attributed to poverty and fear of risk of project failure due to bad weather. The finding is in tandem with that of Oke *et al.* (2007) who found that poverty was a significant determinant of loan diversion. Most of the diverted funds were used for consumption, payment of school fees, payment of hospital bills, reconstructing the collapsed projects, repayment of earlier debts and misusing for personal pleasure such as beer or marriage to additional wives. Gender was seen to play a critical role in diversion where more men diverted their loans than women. From the lender context, late disbursement and releasing of inadequate funds contributed significantly to diversion.

**Table 4.7: Distribution of loan repayment status based on funds usage**

Usage of disbursed funds	Borrowers' compliance*				
	Default	Compliance	Total	Default rate	Compliance rate
Diverted funds	30	36	66	45.5	54.5
Used funds in intended project	7	27	34	20.6	79.4
Total	37	63	100		

\* Figures in the table also represent percentages

From the study area, 45.5% of loan diverters defaulted while 20.6% of non-diverters defaulted. A majority of diverters default because returns from the project that would facilitate debt servicing are missing. This makes farmers to service the facility using off farm sources or dispose a property or borrow from another source to service the agricultural debt. The findings conform to those of Onoja and Emondi (2012) who analyzed gender and poverty effects on loan default rate among arable crop farmers in Rivers State, Nigeria. The study established that poorer clients default more due to diversion of their loans caused by teething problems such as payment of children's school fees, health bills and feeding the households instead of utilizing it in the project. According to Abafita (2003), the impact of diverting funds was negative because loan was used for unintended purposes. This undermined loan repayment performance. In relation to loan diversion, 34.5% implemented the project as compared to 65.5% who diverted the loan. Regarding the default rate, 52.9% of the defaulters were diverters while only 24.7% were non-diverters. This shows that loan diversion is negatively related to loan repayment performance.

Bichanga and Aseyo (2013) established how diversion of loan funds by borrowers leads to default. They found out that 36% of MFI officials agreed that borrowers used credit for project implementation while the majority (64%) acknowledged that loans were diverted. As a result, loan default was likely to be high because of the large proportion of borrowers who do not implement the projects the funds were borrowed for, leading to misuse of funds. Shalini (2011) studied institutional credit to agriculture and its impact on the farm economy in Tumkur District, Karnataka, India. The results indicated that diversion of credit witnessed was particularly high among the farmers. The default rate was highest in the case of marginal farmers (22%), followed by small (12.6%) and large (4%) farmers. However, diversion was found to be less with an increase in farm size in the case of commercial banks. This clearly shows that an increase in farm size promoted greater utilization of credit for the productive uses, thereby increasing loan repayment capacity. Besides, with a decline in farm size, the diversion of credit for other uses increases.

Table 4.8 reveals the influence of loan fund adequacy on repayment capability among the beneficiaries of AFC loan in the area of study. The current study reveals that inadequacy of funds either causes diversion or white elephants (incomplete projects). Adequacy of funds influences loan repayment capacity as can be supported by studies done in various parts of the world. The outcome posits that inadequacy of funds caused 39.6% default, even though respondents who were given adequate funds also defaulted by 34.6%. This shows that larger loans enhance farmers' access to basic inputs and improved farm management opportunities. This causes higher productivity and reduced cost which increases income and in turn helps to repay the borrowed loan.

**4.8: Distribution of loan repayment status based on adequacy of funds**

Adequacy of funds	Borrowers' compliance*			Default rate	Compliance rate
	Default	Compliance	Total		
Inadequate funds	19	29	48	39.6	60.4
Adequate funds	18	34	52	34.6	65.4
Total	37	63	100		

\*Figures in the table also represent percentages

These findings agree with those of Ojiako and Ogbukwa (2012) who carried out the economic analysis of loan repayment capacity of smallholder cooperative farmers in Yewa North Local Government Area of Ogun State, Nigeria. The results revealed that beneficiaries did not have the tendency to divert if substantial amount was approved as loan to farmers. Farmers would use the funds to acquire the basic tools, equipment, and improved technology and other inputs they would require to enhance their operational and marketing efficiency and make positive returns. The investment would pay back itself as well as support the farmer to repay the borrowed funds within the specified period.

#### **4.2.8 Supervision**

Supervision of agricultural credit is critical to efficient utilization of funds and debt repayment. Through supervision a contact is created between the lender and the borrower while ensuring continuous follow up and partnership in project implementation.

Table 4.9 shows the analysis of the findings on credit supervision in AFC, Machakos County. From the results, 80% of the clients agreed that they had been supervised while the remaining 20% felt that supervision was inadequate. Supervision was found to have a great impact on debt servicing because only 27.5% of the supervised borrowers defaulted as compared to 75% of defaulters of the unsupervised beneficiaries. This can be attributed to a gap in contact created between the lender and the client. Thus, more borrowers divert funds to other uses leaving no income to fund the farm project and service the debt.

**Table 4.9: Distribution of loan repayment status based on lender’s supervision**

Supervision by AFC	Borrowers’ compliance*			Default rate	Compliance rate
	Defaulted	Complied	Total		
Not supervised	15	5	20	75	25
Supervised	22	58	80	27.5	72.5
Total	37	63	100		

**\*Figures in the table also represent percentages**

Supervision of loan repayment also ensures consistency in follow-ups of credit servicing. In this case necessary telephone calls, letters and farm inspection visits were done. A client was given the deadline to comply, failure to which the next course of action was taken. The lender should follow the time lines stringently and ensure that the client fulfils his proposal. Supervision plays an important role and its failure undermines the efficiency in debt repayment. This variable was therefore found to have an influence on debt repayment.

Studies undertaken by various scholars have established a direct relationship between credit supervision and efficiency in loan servicing. For instance, Abafita (2003) established that continuous follow up and supervisory visits evaluate loan utilization and repayment. This made borrowers to observe their obligations and improve credit utilization, thereby improving repayment performance. With adequate loan supervision, the probability of using loan funds for non-intended purposes decreases. From the study, 55.4% of the rural borrowers reported that supervision on loan utilization was adequate

while 44.6% stated that it was inadequate. For borrowers who thought that supervision was adequate, 57% were current on debt servicing, while only 41% defaulted. On the other hand, among borrowers who thought that supervision on loan utilization was inadequate, 43% were non-defaulters while 59% defaulted. Therefore, there was a positive relationship between supervision and loan repayment.

Adeniji and Joshua (2008) evaluated loan disbursement and repayment of supervised credit scheme of Nigeria Agricultural Cooperative and Rural Development Bank in Zaria and Kaduna North Local Government Areas of Kaduna State. The study singled out the degree of adequate and timely supervision as critical to the success of agricultural credit. The study defines supervision as the act of keeping a close watch on a loan granted to a borrower to ensure its usage as planned. The researchers found supervision as a method of control that lenders applied to ensure that a borrower does not divert the funds but made a judicious use of it. According to the study, distances were found to affect effective loan supervision by the bank's staff. Proper loans supervision was affected because a majority of the borrowers lived far away, over 20km from the lender.

Besides, Bichanga and Aseyo (2013) found that non-supervision of borrowers on loan utilization was a pointer of higher default rates since no obligation pressure was on the borrowers. The findings indicated that 53% of borrowers had been supervised by the lender on loan utilization while 47% had not been supervised. Among the supervised borrowers, 73% complied in loan repayment while only 27% defaulted.

#### **4.2.9 Farm Visits**

Visits by the lender are vital to loan repayment because they enhance the ownership and responsibility of the project. Farm visits enhance the usage of the funds into the project and ensure that farmers grow by time and create wealth from the project. Studies done by several researchers have shown that this variable is positively related to debt repayment.

Table 4.10 shows the relationship between farm visits and credit servicing capacity. From the results, 73% of the farmers were visited while 27% were not visited. On default rate,

48.1% of the farmers who were not visited defaulted compared to 32.9% who were visited. This is because farm visit improves usage of the funds in the proposed project and enhances the ownership and responsibility of the project between the borrower and the lender who are in contact. Regular visits also serve to strengthen the relationship with the borrower, encouraging repayment while simultaneously gathering information concerning the state of the business and household finances.

**Table 4.10: Distribution of loan repayment status based on farm visits**

Farm visits by AFC officials	Borrowers' compliance*				
	Default	Compliance	Total	Default rate	Compliance rate
Farm Visits not done	13	14	27	48.1	51.9
Farm Visits done	24	49	73	32.9	67.1
Total	37	63	100		

\*Figures in the table also represent percentages

From the current study, it was established that AFC officials visited farmers for varied reasons such as loan appraisal, post disbursement verification, debt collection, review of their record keeping, financial progress, discussion of unexpected problems, offering advice, and inspection of the condition of crop or livestock enterprises and loan collateral. In these cases, the lender talks to the borrower and advises him on project improvement or loan servicing. Farm visits enhance farmers' growth by time and creation of wealth from the project. In most of the cases where the farmer had not been visited, they diverted loan funds and became prone to default.

From other studies, farm visit has been confirmed to have a great impact on loan repayment performance. For instance, Awunyo-Vitor and Wongnaa (2013) established that the number of visits by credit officers will motivate the farmers to work harder and make sure that loans given to them are not diverted to unintended purposes. Borrowers who were visited frequently had higher repayment rates. Increasing the number of supervisory visits by one day increases the probability of a yam farmer's ability to repay the loan by 24.9%. This means that the more the credit officers visit farmers to supervise how the loan is used, the better the farmers' repayment abilities and vice versa.

Further, Eyo *et al.* (2013) studied the effectiveness of loan delinquency management strategies of formal lenders among farmers in Akwa Ibom State, Nigeria. The study established that 87.5% of the banks interviewed agreed that they visit the farmers before loan disbursement while 62.5% of the financial institutions reported that they always visited farmers after loan disbursement. Visits by bank officials reduced loan repayment problems.

#### **4.2.10 Primary Occupation of the Borrower**

The primary occupation of the borrower has an important bearing on debt servicing capacity. This is because it equips the borrower with experience in project undertaking. If the main occupation is sustainable, then the income streams realizable are consistent and this translates into credit repayment.

Table 4.11 presents the occupational patterns of AFC clients in the study area. The patterns demonstrate that the highest percentage (41%) of borrowers were full time farmers while the lowest (13%) were in both other formal employment and self-employment. The majority of full time farmers were old and retired people or beginners who were not experienced in farming and other occupations. Other borrowers who were not purely farmers had additional income from different sources.

The study shows the highest default rate (43.9%) among fulltime farmers while farmers in other formal employment and are self-employment registered the lowest default rate at 23.1%. This implies that participation in agricultural activities does not give borrowers an upper hand in repayment. This contradicts the anticipation that full time farmers service the debt promptly due to accumulated experience and need to earn good credit worthiness image. Full time farmers are also expected to repay well so as to get the benefits associated with farm loans, which sustains the efficiency of farming enterprise.

Moreover, full time farmers defaulted in the area of study due to lack of off farm income. They had no diversified income earning ventures since the greater part of them were old, retired and inexperienced farmers who had turned to farming as the last resort. There was

also the limitation of seasonality in farming which translated into inconsistent incomes. The other reason was natural hazards (for example, bad weather) which face agriculture in semi-arid areas causing increased risk of project failure. This group also defaulted due to the challenges of small scale operations. Examples of these problems include lack of operational and allocation efficiencies for the factors of production; practice of traditional farming methods; obsolete breeding techniques and dependence on rain fed agriculture. On the other hand, clients who were occupied with other activities besides farming had additional earnings, which enabled them to service the loan without a hitch. This is because secondary revenue forms the precautionary income stream, which is a backup in the event of failure of an agricultural undertaking.

**Table 4.11: Distribution of loan repayment based on the occupation of respondent**

Occupation of respondents	Borrowers' compliance*				
	Default	Compliance	Total	Default rate	Compliance rate
Full time farming	18	23	41	43.9	56.1
Business	9	13	22	40.9	59.1
Main formal employment=Teaching	4	7	11	36.4	63.6
Other formal employment	3	10	13	23.1	76.9
Self- employment	3	10	13	23.1	76.9
Total	37	63	100		

\*Figures in the table also represent percentages

The study by Eyo *et al.* (2013) in Nigeria was premised on the assumption that an increase of one unit in primary occupation implies movement from other occupations to farming. The researchers confirmed that other occupations reduce the default rate than farming. Loan usage for agricultural and non-agricultural activities was also found to overcome repayment problems. Good repayment performance was registered among the beneficiaries whose primary occupation was not farming. This points to the fact that loan repayment problem persists among the operators of the agricultural sector.

Different results, which found occupation to be ambiguous, were seen in the research done in Pakistan by Saleem *et al.* (2007). The study established that occupation had no



significant impact on repayment. The explanation was that respondents who did only farming had farming experience and farming knowledge, and thus tried to obtain benefits of credit finance to enhance their agricultural productivity. They promptly repaid their loans to earn good credit worthiness. In addition, respondents with other jobs besides farming made prompt repayment because of more income sources. According to the study, out of 320 respondents, 54.4% of them were purely farmers while 45.6% integrated farming and other jobs. Likewise, 72.4% of farmers who did only farming and 84.9% farmers practiced integrated farming repaid their debt faster. It was also found that 178 farmers repaid cash in lump sum. Further, 53.9% of those farmers only did farming as their occupation while 40.4% farmers did other jobs in addition to farming.

#### **4.2.11 Political Environment of the Client**

Government intervention and policies play a crucial role in the repayment performance of government sponsored loans. The interventions may be based on political motives. Unprofitable special programmes are often imposed on farmers by the government. Beneficiaries of the government facility anticipate such funds to be free or be demanded with little pressure. The expectation by farmers that the government will support their debts affects their commitment and the willingness to pay back. Even though a support program may be aiming at a target group in a certain area, customers in other areas may demand similar support too.

Tables 4.12 and 4.13 show the impact of politics on debt repayment in the area of the current study. The results suggest that politics has influence on credit servicing. The residents of the locality revealed that political pronouncements are weighty. The outcome from the two tables confirm that 13% and 19% respectively did not answer political questions due to the sensitivity with which they perceive politics.

Table 4.12 shows that politicians promised to push for loan write-off in some areas; from the areas where politicians used loan repayment as a campaign tool there were 55% respondents. The default rate was 41.8% in areas where politicians promised loan write-off compared to 31.2% recorded in areas where there were no such political promises.

**Table 4.12: Distribution of loan repayment status based on loan write-off by politicians**

Politicians using write off as campaign tool	Borrowers' compliance*			Default rate	Compliance rate
	Default	Compliance	Total		
Non- response	4	9	13	30.8	69.2
None	10	22	32	31.2	68.8
Affirmative	23	32	55	41.8	58.2
Total	37	63	100		

\*Figures in the table also represent percentages

Table 4.13 reveals that 66% of the respondents trusted the candidates seeking political positions, as they did not seem to understand that they were playing politics. This means that many borrowers were likely to be misled by politicians compared to a few who took an independent stand. Farmers who trusted politicians defaulted by 66.7% while those who paid no attention to politicians' intervention registered a default rate of 28.8%.

**Table 4.13: Distribution of loan repayment status based on clients' view on loan write-off**

Opinion on politicians move to push for write offs	Borrowers' compliance*			Default rate	Compliance rate
	Default	Compliance	Total		
Non-response	8	11	19	42.1	57.9
None	10	5	15	66.7	33.3
Affirmative	19	47	66	28.8	71.2
Total	37	63	100		

\* Figures in the table also represent percentages

From this study, beneficiaries perceive inciting remarks made by politicians as intervention in the government-sponsored loans. This is the likely reason for high default rate in areas where loan repayment is associated with politics. In their efforts to solicit votes, politicians issue all manner of promises, including loan waiver. These utterances incite the majority of followers making them to default. As such, the loan fund is taken as a freebie or a grant. These farmers end up diverting or using the money for pleasure. Loan servicing is not achievable since funds are not invested in a productive venture that

could generate earnings. Such borrowers accept the reality of debt repayment by surprise. What ensue are accusations and counter-accusations between the clients and politicians. A lot of time is lost before repayment because the borrowers visit the politicians to confirm while others seek the attention of the government and the media. The most adamant clients believe in write-off since it has occurred earlier in repayment history or in other places. Such borrowers anticipate politicians to push for write-offs as a way of rewarding them for voting for them. Furthermore, these beneficiaries incite their friends and other farmers elsewhere not to repay the loans.

The expectation of loan write-off makes farmers strategic defaulters since they register loan waiver in their mindsets and wait trusting that their politicians will respond. In turn, this causes a moral hazard which threatens the sustainability of lending institutions. When both the borrowers and the government are sceptical about the necessity to repay loans, the wider implication is that financial discipline is undermined. This is because borrowers think that they can get new loans even though they are defaulters or that their interest can be exempted, hence destroying borrower-client relationship. The choice made by farmers affects their future borrowing and retards development because further loans are not issued in those areas due to fear of default.

Many empirical studies have reported a large rate of default to be a great challenge in most agricultural credit schemes organized or supported by governments. For instance, Udoh (2008), in his study to estimate loan default among beneficiaries of a state government owned agricultural loan scheme in Nigeria, confirmed that loan performance indices estimated that over 75% of the loans disbursed by the government were still held by 59% of the loan beneficiaries. This high level of default was due to official bureaucracy and corruption. Besides, late disbursement caused loan diversion thereby promoting strategic defaulting because opportunistic farmers considered government sponsored loans more as a gift than as a debt that has to be paid back.

Badiru (2010) studied the review of small scale farmers' access to credit in Nigeria. The study established that public credit is subsidized and therefore attracts a low interest rate.

Ironically, its repayment rate is low because borrowers erroneously believe that credit from the government is not supposed to be repaid (CBN, 2005). It was also revealed that the terms and conditions of repayment of public credit were not often well spelt out, and as a result, they habitually mistook the loan for grants. Further, it was found that credit was misallocated to non-intended beneficiaries in government backed credit programs.

Lancaster (2006) studied the outreach depth impact on non-performing loans of a bank for agriculture and agricultural cooperatives in Thailand. According to the study, it was verified that politicians proposed programs that were not economically sound for MFIs since they knew that MFIs got financial support from the government or donors. Clients, on the other hand, were not found to be working efficiently and hard enough in trying to pay back the debt knowing that the politicians would find ways to assist them. Able borrowers also felt that they too had the right to assistance from the MFI or the government on their debt after witnessing other clients benefiting from not paying back.

#### **4.2.12 Adoption of Technology**

Use of technology reduces operating costs and/or influences agricultural productivity and income generation from agricultural activities. Farmers who adopt new technology are able to overcome operational difficulties at minimal cost. In addition, the adoption of innovative technology is important in improving agricultural production and profitability to farmers. New farm technology is associated with the use of new farm machinery and other necessary inputs to increase agricultural production.

This study (table 4.14) established that the relationship between technology and loan repayment was positive. Adoption of technology improves the income status of the client and thus debt servicing capability. Use of technology is associated with a multiplicity of farm uses, type of farming enterprise adopted and high levels of commercialization. Table 4.14 shows the impact of technology on debt servicing based on the type of project that was implemented using the fund borrowed from the corporation. The choice of enterprise in which to implement the project challenged farmers' limits on use of new technology. Crop production had more emerging issues than animal production.

**Table 4.14: Distribution of loan repayment status based on type of enterprise implemented**

Project enterprise for AFC Loan	Borrowers' compliance*				
	Default	Compliance	Total	Default rate	Compliance rate
Animal	21	31	52	40.4	59.6
Crop	10	25	35	28.6	71.4
Trade	6	7	13	46.2	53.8
Total	37	63	100		

\*Figures in the table also represent percentages

The table shows that 52% of the farmers used their money to implement livestock related projects, 35% implemented crop projects while 13% did an agricultural related trade such as cereals, inputs, livestock and butchery. From the study area, 28.6% of the farmers who implemented crop enterprises defaulted. On the other hand, 40.4% and 46.2% of those involved in livestock enterprises and agricultural trade defaulted respectively. The explanation for this phenomenon is that crop enterprise attracted more agricultural stakeholders such as NGOs and KARI who trained farmers on how to apply new technology to improve and modify the farming conditions. As a result, they adopted use of green houses, irrigation and certified seeds. This reduced the risk of crop failure, thus generating more returns and enabling farmers to service loans. Most of the farmers carrying out livestock rearing were conservative and not easily responsive to modern technology. Thus, the default rate was more in this case than in crop enterprise. The highest rate of default was recorded in trade. This is because by nature, trade does not involve direct production and is more prone to failure.

Tables 4.15 and 4.16 present the results of the current study based on the respondents' management of their farming irrespective of the type of enterprise adopted. According to the results, some farmers did not attempt questions regarding their mode of operation in farming. The default rate for the farmers was 38.5% and 30.3% as shown in Tables 4.15 and 4.16 respectively.

Table 4.15 shows how loan repayment is affected by adopting new technology in crop farming. From the results, 39% of the respondents skipped the question which suggested

that they had never practiced crop farming in the past. Among the farmers who answered the question, 29% used traditional technology in crop farming. Thus, they relied on rain fed agriculture and planted their crops on an open seed bed. In contrast, 32% of the respondents embraced modern crop farming technology. Accordingly, they irrigated their crops; raised crops in green houses and used certified seeds for planting. The findings revealed that farmers who used traditional farming technology registered a high default rate of 44.8% which compares with a lower default rate of 28.1% among the farmers who raised their crops under conditions of modern technology. In this case, adoption of new technology in crop farming reduced the default rate by 16.7%. The likely reason is that adoption of modern technology cushions farmers from exposure to risk arising from natural hazards. It also optimizes full capacity exploitation at the least cost combination of inputs. Therefore, crop farming with new technology enabled the loan beneficiaries to inject their money where they were sure they would realize yields.

**Table 4.15: Distribution of loan repayment status based on the level of crop technology**

Nature of crop farming	Borrower's compliance*				
	Default	Compliance	Total	Default rate	Compliance rate
Non-response	15	24	39	38.5	61.5
Using traditional technology	13	16	29	44.8	55.2
Using modern technology	9	23	32	28.1	71.9
Total	37	63	100		

\*Figures in the table also represent percentages

Table 4.16 reveals the outcome of adopting modern livestock rearing technology on debt servicing. Some farmers (33%) skipped the question, suggesting that they had no experience in livestock keeping. Among the respondents who attempted the question, 29% used traditional technology in livestock rearing. As a result, they grazed their animals and used a bull for breeding purposes. Conversely, 38% of the respondents were receptive to emerging technology in raising their livestock. In view of that, they used zero grazing, artificial insemination for breeding and adopted the concept of integration. The results showed that 39.5% defaulted for adopters of modern technology in livestock rearing while 41.4% of farmers defaulted among the users of traditional livestock rearing

technology. Fewer adopters of new technology defaulted because livestock rearing with technology increased productivity, translating into more earnings. With modern technology in livestock enterprise, the default rate reduced by 1.9%. This difference is small compared to 16.7% in crop farming with new technology. This is because in the arid county of study, application of new technology in crop farming is treated with more sensitivity than animal rearing with modern technology. The reason is that in the crop enterprise, technology grows at a faster rate with an accompanying increase in yields than in livestock enterprise. The second reason is that stakeholders such as the Ministry of Agriculture, church, community based organizations and NGOs perceive crop production to be more direct in increasing food sufficiency. This finding conforms to that of Mejeha and Obunadike (1998) who reported that the rate of adoption of new technology by farmers is generally high if the probability of a change over to new technology, the economic position of the farmers and the effectiveness of the extension agents are high.

**Table 4.16: Distribution of loan repayment status based on the level of animal technology**

Nature of livestock rearing	Borrowers' compliance*				
	Default	Compliance	Total	Default rate	Compliance rate
Non-response	10	23	33	30.3	69.7
Traditional rearing	12	17	29	41.4	58.6
Modern rearing	15	23	38	39.5	60.5
Total	37	63	100		

\*Figures in the table also represent percentages

Following from the above results, it is noteworthy that new technology is imperative for a sustainable agribusiness venture. This is because it enhances operational convenience, which increases farm yields and earnings, and consequently improves the capacity to service credit. To invest in new technology requires financial sacrifice, thus the relevance of credit. This premise supports the findings of Okpara *et al.* (2013) on the investigation of loan repayment performance of smallholder oil producers in Nigeria. The study revealed that farmers spent more on adoption of innovation with credit than without credit. This is because the availability of credit afforded farmers the opportunity to access more farm inputs.

### 4.2.13 Agricultural Diversification

Table 4.17 shows the number of farming activities carried out by the beneficiaries of AFC loan and how they influence loan repayment performance. A multiplicity of farm uses defines the levels of diversification by farmers, hence farm use efficiency. These minimize the risk exposures of farmers to natural hazards and risk of loss of market share. As a result, farmers reduce the opportunity costs because they have alternative activities to concentrate on. This means there is a fair trade off. Spreading the risk improves the marketing efficiency by ensuring that farmers do not lose their market share by failing to deliver on their supply obligations. Farmers also shift to alternative activities when there is glut production, causing prices to drop in the market.

**Table 4.17: Distribution of loan repayment status based on number of agricultural enterprises**

Number of agricultural activities	Borrowers' compliance*				
	Default	Compliance	Total	Default rate	Compliance rate
Single	19	25	44	43.2	56.8
Double	15	26	41	36.6	63.4
Triple	3	9	12	25	75
More than triple	0	3	3	0	100
Total	37	63	100		

\*Figures in the table also represent percentages

From the operation analysis in Table 4.17, 44% were single activity farmers, 41% had two activities, 12% had three activities and 3% had more than three agricultural activities on their farm. This reveals that 85% had no more than two activities. It means that the majority of loan beneficiaries were rural based farming households who had not diversified their agribusiness. The default rate was the highest among single activity farmers at 43.2% while farmers with more than three enterprises did not default. Thus the default rate reduces with the number of agricultural activities on the farm. This is because diversified agriculture brings more farm earnings and improves efficiency in debt servicing.



#### **4.2.14 Loan Making Efficiency**

Loan making efficiency is crucial to having well performing loans. The proficiency in servicing a debt impacts on the sustainability of the financial institution. The relationship between this variable and loan repayment is normally positive implying that a good loan will be serviced easily compared to a bad loan. This connects well with the ideology that “a loan is repaid before it is made”. This follows that loan making officials should carefully scrutinize the prospects before the process of loan making begins. This is done by thoroughly screening and vetting the applicants to determine who to lend and who to leave out. Vetting also helps to fix the loan ceiling and alleviate loan repayment constraints. In the current study, agricultural loan efficiency is defined by screening the multiple borrowing, the distance from AFC office to the client’s place and the repayment method which the clients choose.

Researchers from various parts of the world underscore the importance of screening the loan applicants. For example, Ejike *et al.* (2013) studied agricultural credit risk and default management by banks in Imo State, Nigeria. According to the study, sound lending is an art not a science and the success of the system depends critically upon a positive risk management culture. This relies on data gathered in the screening process that are guided by well-articulated policies, responsible evaluation and disbursement of loans to agriculture will be virtually impossible.

Absanto and Aikaruwa (2013) studied credit rationing and loan repayment performance of Victoria Savings and Credit Cooperative Society in Mwanza District of Tanzania. The study revealed that in order for the screening mechanism to be efficient it has to consider the factors that influence loan repayment performance. The screening criteria is efficient in vetting the credit worthiness of borrowers as well as in determining the appropriate loan size, and terms and conditions that take into account the repayment capacity of the borrower.

Abafita (2003) studied microfinance and loan repayment performance of Oromia Credit and Savings Share Company (OCSSCO) in Kuyu, Ethiopia. The results revealed that the

screening technique was found to be good although there were some problems of separating between creditworthy borrowers and those who were not. Generally, the evidence in the study reveals that the overall repayment performance of the borrowers and the screening technique, which the institution follows to ration the loan to its clients, were found to be sound.

As shown in Table 4.18, the current study established that multiple borrowing divides the attention of the clients on which loans to service. The table as shown, it suggests that the farmers who have other loans do not implement the projects they were borrowing loans for but instead divert the money to repay earlier loans. The table shows that 70% of the respondents had only AFC loan while 30% had other loans on top of AFC loan. From the results, 31.4% of the clients who had only AFC loans defaulted compared to 50% who had additional loans. This means that multiple borrowing increases the probability of default by 18.6%. The reason for a high default rate is the burden of servicing other loans, which divides the attention of the borrower. Those with only one loan concentrate on its repayment, thus lowering the default rate.

Studies by various scholars have proved that multiple borrowing impacts on debt servicing capability. For instance, Mpogole *et al.* (2012) analyzed the incidences of, reasons for, and effects of multiple borrowing on loan repayment at Iringa Municipality in Tanzania. The study revealed that prevalence of multiple borrowing was very high. Over 70% of the 250 microfinance clients surveyed had at least two loans from different MFIs at the same time. About 16% had also borrowed from individual lenders. Thus, findings showed that the major reasons for multiple borrowing were insufficient loans from MFIs, loan recycling, and family obligations. Over 70% of respondents had problems in loan repayment because of multiple pending loans.

Kumar (2009) studied the understanding of customer behaviour on multiple borrowing through prospect theory among the Indian microfinance clients. He revealed two reasons for multiple borrowing. First was due to some unexpected negative shocks after the loan was taken which could hurt borrowers and their businesses. This made it impossible for

them to repay the loan. Thus, borrowers decided to go for additional loan in order to repay the first, increasing dangerously their level of indebtedness. Secondly, multiple borrowing comes from the fact that micro-loans can be too small to cover the borrowers' needs for a specific investment. In order to obtain the gap in capital, they might find it convenient to hide their real level of indebtedness and ask for additional loans from different institutions.

**Table 4.18: Distribution of loan repayment status based on multiple borrowing**

AFC and other loans	Borrowers' compliance*		Total	Default rate	Compliance rate
	Default	Compliance			
AFC loan	22	48	70	31.4	68.6
AFC and other loans	15	15	30	50	50
Total	37	63	100		

\*Figures in the table also represent percentages

In the current study, the findings reveal that the distance from the AFC office to the commune (collective farm) had a negative influence on loan repayment because of its association with transaction costs. This includes the cost of travel, risk of carrying the money, time, and lack of willingness because clients are aware that it would take time for the lender to follow them. Distance in this case is an elimination criterion when screening, unless other credit factors are extremely strong to compensate for the impact of distance.

Table 4.19 shows the relationship between the distances of borrowers and AFC office and the effect to debt servicing. The findings reveal that 30% of the farmers live near the office (within 5 kilometres) while 14% live more than 20 kilometres away (a distance considered far). It can be seen from table 4.19 that clients who lived within a distance of up to 5 kilometres defaulted by 23.3% (lowest rate). The highest default rate (57.9%) was registered among farmers living between 15 and 20 kilometres. However, clients staying farthest (distance beyond 20 kilometres) recorded a low default rate of 28.6%. This means that the default rate increases with an increase in distance up to a certain level beyond which there is no effect. The reason the default rate is low at short distances is

that farmers are able to access the AFC office quickly. The other reason is the convenience in accessibility of these distances by AFC officials to make relevant follow-ups. However, distance does not affect clients who reside far away, because the lender makes very good loans or encourages them to adopt a suitable repayment method such as salary deduction order or bank order. These clients also fear visits to their farms due to heavy charges. Consequently, clients living farthest from AFC office also repay their loans well.

**Table 4.19: Distribution of loan repayment status based on borrower distance to AFC**

Categories of distance	Borrowers' compliance*				
	Default	Compliance	Total	Default rate	Compliance rate
Less than or equal to 5km	7	23	30	23.3	76.7
Greater than 5 to 10km	4	7	11	36.4	63.6
Greater than 10 to 15km	11	15	26	43.3	57.7
Greater than 15 to 20km	11	8	19	57.9	42.1
More than 20km	4	10	14	28.6	71.4
Total	37	63	100		

\*Figures in the table also represent percentages

Empirical evidence from different studies outlines the effect of distance in loan repayment performance. For example, Ibrahim and Bauer (2013) studied access to micro credit and its impact on farm profit among rural farmers in the dry land of Sudan. The study found out that if the average distance between the commune and microfinance institutions is too far, farm households will have to incur high transaction costs and consequently will have lower farm profits. These costs include transport, important documents needed to obtain loans and collateral. In addition, Awunyo-Vitor (2012) revealed that if a borrower was located near the lender, it was easier for the lender to get information, monitor the borrower, and provide appropriate assistance to reduce loan repayment default. Thus, borrowers who lived closer to their lenders were less likely to default on loan repayment.

From the current study, it has been found that for efficient loan making, the lender should also screen the loan repayment method which would be suitable for a particular client. This is because the method has a bearing on the procrastination and the distance of the client's residence to the paying office. A client paying in cash is more prone to deferment when an emergency arises and he spends the money which could have repaid the loan. A client residing far may also fail to remit his repayment to the office.

Table 4.20 shows the influence of loan repayment method on repayment performance of farm loan. From the results, 71% of the respondents repaid the loans in cash, 24% used bank orders while 5% signed salary deduction orders. From this observation, a majority of the farmers use a cash repayment method. This is because most farmers are not conversant with banking procedures. Other clients have inconsistent incomes while the majority, especially the old, do not trust the banks.

From the results, it was established that a majority (43.7%) of farmers who serviced their loans using a cash method defaulted. Among the farmers who repaid using a bank order, 25% defaulted. For farmers who repaid their loans using a salary deduction order, none defaulted. The likely explanation for the high default rate among farmers using a cash method is deferment in case of an emergency or lack of time for those residing far from the office.

**Table 4.20: Distribution of loan repayment status based on method of repayment**

Method of loan repayment	Borrowers' compliance*			Default rate	Compliance rate
	Default	Compliance	Total		
Cash	31	40	71	43.7	56.3
Bank Order	6	18	24	25	75
Salary Deduction Order	0	5	5	0	100
Total	37	63	100		

\*Figures in the table also represent percentages

#### **4.2.15 The Suitability of Loan Scheme**

Enhancing the scheme means improving the conditions of the loan during its life cycle (from the time of application to the final repayment date). This implies an improvement of the relationship between the borrower and the lender during the history of the loan. Excellent customer care is indispensable in order to ensure convenience and satisfaction of the client. Agricultural business is sensitive due to challenges that face it, thus necessitating the need for special attention. In the case of agricultural loans, welfare and social responsibility issues are vital in order to address the objective of producing food to alleviate hunger and enhance food sufficiency. To achieve the desired appropriateness, time dimension is important. The time element is important because agricultural production is time-bound due to seasonality. From the current study, a sound scheme combines a package where appropriate time lines are considered. Suitable periods embrace good turnaround time between application and disbursement, giving a grace period and offering adequate repayment duration.

Table 4.21 presents the findings on the scheme suitability from the study area and how it influences loan default. According to the findings, 77% were satisfied with AFC loan scheme regarding timelines. This is because AFC adheres to stringent dictates of timelines. However, some clients felt that the institution should reduce bureaucratic bottlenecks and eliminate upfront fees. Other respondents felt the scheme would be improved by increasing the grace period from the current three months to at least six months, especially for livestock and horticultural projects. The other recommendation was to increase the loan gestation for development and large-scale loans from the current three years to at least five years. The findings on the repayment performance reveal that 35.1% of the clients who found the scheme suitable defaulted compared to 43.5% who were not satisfied with the scheme. The likely reason was diversion of loan, high prices of inputs and loss of market share because of late releasing of funds. The delay in releasing funds might make some borrowers to drop out after one cycle of credit or not to ask for credit in the future. Many farmers felt that timely disbursement of the approved loan to benefiting farmers should commence on or before planting season. The reasons for the lag in loan disbursement were long procedure, few officials and borrower's

problems. The net effect of late disbursement is an increase in cost, which in turn increases total farm expenditure of the beneficiaries. The spill over effect of this is increasing default rate because when input use efficiency among the beneficiaries is low, the marginal value of the output produced with the loan is lower than the unit cost of the inputs used.

**Table 4.21: Distribution of loan repayment based on client opinion on scheme suitability**

Suitability of loan scheme	Borrowers' compliance*			Default rate	Compliance rate
	Default	Compliance	Total		
Unsuitable	10	13	23	43.5	56.5
Suitable	27	50	77	35.1	64.9
Total	37	63	100		

\*Figures in the table also represent percentages

Several studies have shown a time lapse between application and disbursement to have an effect on debt servicing efficiency. Afolabi (2010) studied the analysis of loan repayment among small-scale farmers in Oyo State, Nigeria. According to the study, untimely disbursement of loan negatively affected loan repayment because agricultural production is time specific. Therefore, instead of utilizing the loan for agricultural purposes, farmers diverted the loan because it did not coincide with the time they needed it for agricultural production. High cost of production could make agricultural ventures less profitable and hence negatively affect the borrowers' loan repayment capacity. Besides, Adegbite (2009) studied the repayment performance of receivers of Ogun State Agricultural and Multi-purpose Credit Agency in Nigeria for the period 2004-2007. The findings of the study revealed that timeliness is important because it is required in agricultural production to allow the operations to yield some profits for reinvestment and re-payment of loans. Because of late disbursement, there is a tendency for fund mismanagement and diversion to purposes other than for which the beneficiaries obtained loans.

This study has shown that a reward system is more of a welfare issue than a responsibility. This makes the farmer to feel the concern of the lender, thus enhancing the relationship. Rewarding benefits apply to farmers who have completed repayment or have a repayment problem due to natural hazards resulting from bad weather and

catastrophes. One of the benefits associated with good loan completion is graduation, which in turn helps in boosting the business, family stability and enhancing the relationship. Benefits which apply when the farmer experiences a challenge in repayment are interest concession, loan rescheduling and debt suspension.

Table 4.22 shows the impact of rewards on loan repayment performance from the study area.

**Table 4.22: Distribution of loan repayment status based on loan scheme reward**

Benefits of AFC loan reward	Borrowers' compliance*			Default rate	Compliance rate
	Default	Compliance	Total		
Non-response	2	2	4	50	50
None	4	2	6	66.7	33.3
Affirmative	31	59	90	34.4	65.6
Total	37	63	100		

**\*Figures in the table also represent percentages**

From the results, 4% skipped the question, 6% were not satisfied with rewards while 90% were comfortable. This means that AFC is concerned with the welfare of the clients. Thus, many felt that the reward was adequate. Those who skipped the question were likely to be biased. The analysis shows that 50% of those who skipped the question defaulted. The farmers who benefited by being current on their repayments least defaulted by 34.4% compared to 66.7% who never benefited. The least numbers of defaulters were found in rewards where farmers benefited by boosting their businesses and being allowed to access next higher loans. The likely reason is that the reward system caused improvement in the agribusiness. This made farmers feel proud to be associated with AFC and as such worked hard to maintain this relationship. This in turn improved their economic status and improved debt servicing capacity.

#### **4.2.16 Land Dynamics**

Land issues are sacrosanct and emotive. The sensitivity has an impact on the repayment performance of the loan. The effect of land outlook on loan repayment is complex and



not unidirectional. The heterogeneity of land outlook causes effects on loan repayment. The approach to land concerns from geographical regions and communities is multi-faceted. Land issues cause strategic default among the loan beneficiaries. From the current study, land dynamics, which affect loan repayment performance, include the relationship between client farms, traditions relating with land and collateral value. From the perspective of secured agricultural loans such as the ones advanced by AFC, three main purposes of the farm emerge as follows:

- *Security farm* - used as collateral to secure the loan.
- *Home farm* - where the home of residence is constructed.
- *Project farm* - used for implementing farming project for whose purpose funds are borrowed.

A farmer may use one farm for all the three purposes, one farm for two purposes or each farm for its own specific purpose. From these uses, five categories of farm purposes emerge:

- Combined project, security and home uses.
- Combined project and security uses farm.
- Combined project and home uses farm.
- Combined security and home uses farm.
- Each farm for its own use.

The relationship of the farm which hosted the permanent home of residence was analyzed in connection to project farm and security farm. Results revealed that the proximity of the project to the homestead had an impact on loan default while the nearness of the security farm to home had a negative influence (Table 4.23). The closer to the project the homestead is, the less the default rate. Proximity of the place of permanent residence to the project has great implication on the management, monitoring and evaluation of the farm projects. A closely supervised farm will minimize losses associated with theft of inputs and negligence of duty of labourers. This explains the reason for the least default where the farm is used for project and home purposes, at 25%. The second reason for

least default in this category is fear of shame arising from the lender’s visit to the farm for inspection of the project or collection purposes where the client’s records are not up to date.

**Table 4.23: Distribution of loan repayment status based on land dynamics**

Clients’ farms purposes	Borrowers' compliance*				
	Default	Compliance	Total	Default rate	Compliance rate
Non-response	5	6	11	45.5	54.5
Combined project, home and security uses farm	12	23	35	34.3	65.7
Combined project and security uses farm	5	8	13	38.5	61.5
Combined project and home uses farm	4	12	16	25	75
Combined security and home uses farm	7	6	13	53.8	46.2
Each farm for its own use	4	8	12	33.3	66.7
Total	37	63	100		

**\*Figures in the table also represent percentages**

The element of security purpose in closeness to home purpose increases the default, hence the highest default rate of 53.8% in the situation where security and home purposes are combined. This is due to reduced fear associated with hard recovery through auctioning when the homestead is in the security farm. This is because in such a case, the auctioneer serves the property owner with an eviction notice and later the order to leave which is a long and tedious process. In addition, it is hard to monitor the progress of the project closely because of separating effect. Therefore, the closer to the security farm the homestead is, the more the default rate. From the results, 11% of the respondents did not answer the question due to the sensitivity of the subject regarding land.

Traditions concerned with the land relate to witchcraft and burial of descendants. Because of the sensitivity of this matter, default is hard to measure. However, this issue was found to have a serious negative influence on loan servicing in the region. This is

because of fear of stepping into the land let alone buying such land where the family had buried a relative or the family deals with witchcraft. This makes the farmer to strategically default.

Collateral value affects repayment in a case where the borrower fails to repay for a long time and the charges accumulate to exceed the value of the land. The same problem can arise if the land was overvalued or depreciation of land occurs due to insecurity or other reasons in the area.

The cumulative effect of land in a scheme loan sponsored by the government for agricultural purposes is critical. It not only causes default but also bad debts because of the problem of recovering funds. It is noteworthy that in any case debt recovery takes long where the security is land because it is a fixed asset and the transactions involving it are slow.

#### **4.3 REGRESSION ANALYSIS**

The descriptive analyses as presented in section 4.2 only suggest the effects or impacts of the various factors on loan repayment performance. Regressions offer a more unambiguous approach to assessing the effects and or impacts of these factors. Thus, to provide further insights, it is important to measure the contribution of each variable to total default. Therefore, regression analyses were performed to address the inadequacy of descriptive analyses of failing to show the contribution of these variables. Regression statistics tackle the direction and magnitude of each of the variables that influences the dependent variable. Thus, a positive or negative contribution of the variable is given and the level of statistical significance is determined. All the variables that were analyzed and discussed in descriptive statistics are tested for significance and discussed. These include gender, age, education, off farm income, credit experience, farming experience, funds use, supervision, farm visits, occupation, political environment, adoption of technology, agricultural diversification, loan making efficiency, suitability of loan scheme and land dynamics.

### 4.3.1 Choice of Regression Model

The choice of the model was based on what the variables are meant to measure. The current study is intended to measure either default or compliance of borrowers in debt servicing. In this case, linear regression is inappropriate because the measure of the dependent variable is not continuous. Thus, binary logistic regression was adopted to determine which predictor variables were statistically significant. The reason for the choice of this model was that the study was meant to determine either default or compliance rate in loan repayment. In this model, diagnostics are used to check the validity of assumptions and calculate a test-statistic that indicates if the overall model is statistically significant. Besides, a coefficient and standard error for each of the predictor variables are calculated. The general regression model used can be presented as follows:

$$Y = \alpha + \beta_1 \chi_1 + \beta_2 \chi_2 + \beta_3 \chi_3 + \dots + \beta_n \chi_n + e$$

Where:

$Y$  = Compliance in loan repayment

$\alpha$  = Constant term

$\beta_1, \beta_2, \beta_3, \dots, \beta_n$  = Regression coefficients

$\chi_1, \chi_2, \chi_3, \dots, \chi_n$  = Independent variables

$e$  = Error term

The specific logistic regression model used can therefore be represented by:

$$y = \alpha + \beta_1 G + \beta_2 A + \beta_3 OC + \beta_4 OFI + \beta_5 AE + \beta_6 FE + \beta_7 CE + \beta_8 MB + \beta_9 FV + \beta_{10} S + e$$

Where:

$Y$  = Compliance or default in debt repayment (2=compliance, 1=default)

$G$  = Gender of the respondent (male = 1, female = 2)

$A$  = Age of the applicant (years)

$E$  = Education (Level of achievement)

OC= Occupation of the beneficiary  
OFI= Off-farm income activities (additional sources of income)  
T= Technology (Agricultural diversification)  
FE = Farming experience (years)  
CE= Credit use experience (Number of borrowings)  
MB= Multiple borrowing (Additional loan)  
FU= Funds usage in the project (used=2, diverted=1)  
LS= Loan scheme (Suitable=2, Unsuitable=1)  
FV= Farm visit  
S= Supervision  
PE= Political environment (Political verdict)  
LD= Land dynamics (Land purpose)  
 $\alpha$ = Constant term  
 $\beta$ s = Regression coefficients  
e = Error term

#### **4.3.2 Summary of Variables Used in the Regression Analysis**

It is important to provide summary statistics on the variables tested in the regression analysis for a better understanding. The units of measure, mean, minimum and maximum are defined in Table 4.24 for all the variables. It is noteworthy that five explanatory variables have components of definition. These variables include loan usage (use of funds and adequacy of funds); political environment (write off as a tool of campaign and political verdict); adoption of technology (enterprise type for AFC loan, level of crop technology, level of animal technology and number of agricultural activities); loan making efficiency (multiple borrowing, distance to AFC and method of loan repayment); and suitability of loan scheme (borrower opinion on scheme suitability and AFC loan reward).

**Table 4.24: Summary of variables in the regression analysis**

Variables	Unit definition	Median	Mode	Minimum	Maximum
<b>Dependent variable:</b>					
Loan default rate	Binary-Percentage Default-1; Compliance-2	2	2	1	2
<b>Explanatory variables:</b>					
Gender	Binary Male 1; Female 2	1	1	1	2
Age	Categorical years Less than 40 years 1; 40-60 years 2; Above 60 years 3	2	2	1	3
Education	Categorical Level Basic primary and secondary 1; Middle level trainings certificate and diploma 2; Bachelor's degree 3; Master's degree 4; PhD degree 5	1	1	1	5
Off farm income	Binary Without off farm income 1; With off farm income 2	2	2	1	2
Experience in credit use	Categorical Number of borrowings Single borrowing 1; Double borrowing 2; Triple borrowing 3; Above four times 4	3	4	1	4
Farming experience	Categorical Years More than 5- 10 years -1; More than 10- 15 years-2; Above 15 years-3	2	2	1	3
Loan usage:					
Used in project	Binary Diverted funds 1; Used funds 2	1	1	1	2
Adequacy of funds	Binary Inadequate funds 1; Adequate funds 2	2	2	1	2
Supervision	Binary Not supervised 1; Supervised 2	2	2	1	2
Farm visits	Binary Farm Visits not done 1; Farm Visits done 2	2	2	1	2
Occupation of respondents	Categorical Types Full time farming 1; Business 2; Main formal employment Teaching 3; Other formal employment 4; Self- employment 5	2	1	1	5
Political environment:					
Write off as tool of campaign	Binary None 1; Affirmative 2	2	2	1	2
Political verdict	Binary None 1; Affirmative 2	2	2	1	2
Adoption of technology:					
Enterprise type for AFC loan	Categorical Type Animal 1; Crop 2; Trade 3	1	1	1	3

Level of crop technology	Categorical Type Using traditional technology 1 ; Using modern technology 2	2	1	1	2
Level of animal technology	Categorical Type				
Agricultural diversification:	Traditional rearing 1; Modern rearing 2	1	2	1	2
	Categorical Number Single 1; Double 2; Triple 3; More than triple 4	2	1	1	4
Loan making efficiency:					
Multiple borrowing	Binary AFC loan 1; AFC and other loans 2	1	1	1	2
Distance to AFC	Categorical Kilometres Less than or equal to 5km 1; Greater than 5 to 10km 2; Greater than 10 to 15km 3; Greater than 15 to 20km 4; More than 20km 5	3	1	1	5
Method of loan repayment	Categorical Types Cash 1; Bank Order 2; Salary Deduction Order 3	1	1	1	3
Suitability of loan scheme:					
Borrower opinion on suitability	Binary Unsuitable 1; Suitable 2	2	2	1	2
AFC loan reward	Binary None 1; Affirmative 2	2	2	1	2
Clients' farms purposes	Categorical- Use Project, home and security purposes 1; Project and security purposes 2; Project and home purposes 3; Security and home purposes 4; Each farm its own purpose	2	1	1	5

#### 4.3.3 Discussion of the Hypothesized Variables in the Regression Analysis

In this study, several variables were used in the regression in order to establish their level of contribution to loan default. The discussion refers to all the variables tested. At this stage, discussions of all the hypothesized variables that define default are given without selecting to eliminate those that correlate with each other. The variables which were tested to establish their contribution to default rate are discussed below.

*Gender of the respondent* was measured by the sex of the clients who benefited from AFC loan. The question of whether the loan beneficiary was a male or female influenced the direction and magnitude of default. The likely reason for selecting the variable for

testing is that more males who normally have higher default rate than females were taking loan. This implies that by targeting to increase the proportion of female applicants, the lender significantly reduced the default rate. Women beneficiaries are associated with significantly lower portfolio at-risk and lower portfolio write-offs.

The *age variable* was measured by the number of years the respondent has lived. The variable was selected for testing because most of loan applicants from the area of study are old or retirees from formal employment who engage in agribusiness as a counsel of despair. This implies that default rate is expected to be high because as the age advances, an increasing number of farmers are fraught with debt repayment problems.

*Education* was measured in years of schooling which translates into a certain level of literacy. The variable was selected because the majority of applicants from the area of study had low levels of education. Education level is expected to be positively related to loan repayment because the higher the level the better the performance in debt servicing.

*Primary occupation* was measured by the income generating activity that the respondent engages in. The variable was selected because if the primary occupation of the borrower is farming, it is likely to have an impact on the servicing of a farm loan. The variable is expected to have a negative coefficient because many loan beneficiaries had no diversified income earning ventures since the greater part of them were old, retired and inexperienced farmers who had turned to farming as the last resort. There was also the limitation of seasonality in farming which translated into inconsistent incomes.

*Off farm income* refers to additional sources of income besides farming. From the area of study, some respondents had off farm income while others did not. The relationship between this variable and loan repayment is expected to be negative because clients with less sources of off farm income registered more default rate in debt servicing. The implication is that decrease in the level of off farm activities is likely to increase noncompliance in loan repayment. The reason is that farm income is used to pay for family expenditure thus leaving little or none to service the loan. The variable is expected



to be a negative relationship and because farmers without off farm income rely more on drawings from the farm to finance family expenditure and/or to supplement their limited farm income in lower income periods (e.g. drought) years.

*Agricultural diversification* is an indicator of adoption of technology in farming. It refers to a multiplicity of farm use. Clients who have fewer activities on their farms are more likely to default than those with more activities. The effect of the variable is expected to be positively related to loan repayment because the more diversified a respondent is, the more the compliance in debt servicing capacity.

*Farming experience* describes the number of years the borrower has practised farming. Long experience is associated with familiarity and exposure to agribusiness. The variable is expected to be positively related to loan repayment performance because many years of involvement equips the farmer with knowledge to perform relevant tasks and understand the timing of agribusiness. This minimizes losses and risks and in turn increases income which gives the beneficiaries an upper hand in debt servicing.

*Credit use experience* is measured in the number of times that the borrower has attained credit irrespective of the source. The total loan borrowings that the farmer has done in the area of study is expected to relate positively with debt serving since the more the frequency in borrowing, the more the compliance in repayment of credit. More experienced borrowers attain more exposure and credit use efficiency which enables them to manage loan funds in a manner which maximizes the returns of an agribusiness project. Besides, the rate of loan diversion was found to be less among the farmers who were more experienced in credit use.

*Multiple borrowing* is a component of loan making efficiency variable which shows the different lenders from which the borrower has obtained loans. It is expected to be negatively related to loan servicing efficiency because it describes over-indebtedness which over-burdens the borrower and contributes to loan default. It was measured by the additional loan on top of AFC loan which the farmer has while still servicing the AFC

loan or before applying for a loan. This is one of the aspects which are looked at during the loan screening process so as to achieve efficiency in loan making and thus have good loans.

*Funds usage* means utilization of borrowed money in the project which was sanctioned by the lender. This implies that production resources are expended for the right purpose. This variable was measured by identifying whether the borrowed money was diverted or put into the intended use. It was also expressed by finding out from the loan beneficiaries if the accessed debt was adequate or inadequate. Funds usage is expected to be positively related to compliance because more use of funds for the sanctioned project it is more likely to generate income which facilitates debt repayment and gradually create wealth.

*Loan scheme* refers to the responsibility of the lender to provide sound conditions for use of loan during its gestation. This follows that loan duration should be accompanied by convenient provisions such as availing of funds in time, providing reasonable moratorium and extending a maturity period of loan with realistic and convenient length. The variable was measured by inquiring from the borrowers if the scheme was suitable or unsuitable and if they were rewarded for servicing their debt well or not. Loan scheme is expected to have a positive relationship with compliance in debt repayment. This is because a good scheme provides suitable conditions which ensure that customers are cared for and helped to use the loan facility in a way that generates returns that help borrowers to service the loan and create wealth.

*Farm visits* refer to lenders' appointment at the farmers' commune to gather information about the state of affairs of the project. Visits are done to appraise the project's viability and also to inspect the ongoing project and recommend the measures which can ameliorate the current state of affairs. The variable was measured by asking the loan beneficiaries if the visits were done or not. It is expected to have a positive relationship to loan repayment because more visits are likely to improve the debt repayment capacity.

*Supervision* refers to monitoring and follow-ups which take place during the gestation of credit. Agricultural lending is supervised due to the sensitivity of projects undertaken. The variable was measured by identifying if the borrowers were supervised or unsupervised. Supervision is expected to have a positive relationship to loan repayment because an increase in debt administration triggers more compliance in credit servicing due to the contact that is created between the two parties in contract (lender and borrower).

*Political verdict* is an element of the political environment which assesses the borrowers' opinion on the politicians' move to push for write off. It measures whether farmers agree or differ with politicians regarding their intention to campaign for loan waiver. The variable is expected to have a negative coefficient to compliance in debt servicing since the political campaign of this nature is likely to create a moral hazard and proliferate strategic defaulting.

*Land use purpose* refers to the dynamics of land use in relation to borrowed funds. AFC loan is a secured type of loan and the collateral that is offered is the land title deed. In this respect, land is associated with social and political connotations. The variable was categorical and was measured by assessing if different parcels of land were used for different purposes or whether a single parcel was used for combined purposes relating to farm loan. The purposes in reference are mainly categorized as security, project and home. In this case, land use purpose was further divided into 5 categories such as project, home and security purposes; project and security purposes; project and home purposes; Security and home purposes; and each farm for its own use. The relationship between the variable and loan repayment performance expected to be negative because a decrease in land independence of use (more combinations especially with security farm) is likely to increase loan default rate. This implies that clients with more farms to use for independent purposes will have an upper hand in debt repayment capacity as long as their residence guarantees them proximity to keep surveillance to the project farm with a view to closely monitor the implemented agribusiness project. On the other hand, clients with one or two farms are more likely to default than their counterparts if any land use

(particularly more permanent land use such as construction of home) is combined with land used for security purposes.

#### **4.3.4 Best-fit Model**

Table 4.25 presents the correlation matrix for all the hypothesized variables. Based on correlation coefficients and their level of significance, some of the hypothesized variables were eliminated from the model. This was done by eliminating one of the less important correlating variables in each case (based on theory) first and then doing away with the least significant variables on a one by one basis. In this case, 10 variables satisfied the selection criteria and qualified to enter the final regression model. These include gender, age, off farm income, agricultural diversification, farming experience, credit use experience, multiple borrowings, farm visits, supervision and political verdict.

**Table 4.25: Correlation matrix for all the hypothesized variables**

	Constant	Gender	Age	Education	Occupation	Off farm income	Agricultural diversification	Farming experience	Credit experience	Multiple borrowing	Funds usage	Loan scheme	Farm visits	Supervision	Political verdict	Land purpose
Constant	1.000															
Gender	0.101	1.000														
Age	0.027	-0.384	1.000													
Education	0.000	-0.078	-0.020	1.000												
Occupation	-0.401	-0.341	0.060	-0.413	1.000											
Off farm income	-0.278	-0.369	0.368	-0.319	0.368	1.000										
Agricultural diversification	-0.185	0.402	-0.520	-0.052	-0.187	-0.495	1.000									
Farming experience	-0.152	0.292	-0.365	0.430	-0.476	-0.657	0.613	1.000								
Credit experience	-0.386	0.043	-0.339	0.051	0.124	-0.066	0.279	0.281	1.000							
Multiple borrowing	-0.049	0.004	0.203	-0.518	0.374	0.409	-0.267	-0.655	-0.222	1.000						
Funds usage	-0.074	0.119	0.064	-0.186	0.055	-0.323	0.282	0.215	0.002	0.162	1.000					
Loan scheme	-0.224	0.150	-0.312	0.131	-0.166	-0.366	0.160	0.326	-0.066	-0.128	-0.045	1.000				
Farm visits	-0.436	-0.079	-0.551	0.259	0.146	-0.090	0.251	0.334	0.324	-0.406	-0.207	0.157	1.000			
Supervision	-0.349	0.220	-0.426	0.242	-0.077	-0.309	0.358	0.380	-0.063	-0.428	-0.166	0.389	0.433	1.000		
Political verdict	0.045	-0.417	0.521	-0.162	0.466	0.521	-0.574	-0.689	-0.268	0.348	-0.232	-0.414	-0.200	-0.303	1.000	
Land purpose	0.169	0.138	0.221	-0.232	-0.154	0.110	-0.394	-0.332	-0.259	0.551	0.045	0.066	-0.447	-0.318	0.032	1.000

Table 4.26 provides the results of the correlation analysis of the 10 variables in the regression model while Table 4.27 shows the results of these variables in the model. The estimation of 10 variables was done using regression. The findings showed 4 variables to be statistically significant at 5% while 4 variables were weakly significant, at 10%.

**Table 4.26: Correlation matrix for the final regression model**

	Constant	Gender	Age	Off farm income	Agricultural diversification	Farming experience	Credit experience	Multiple borrowing	Farm visits	Supervision	Political verdict
Constant	1.000										
Gender	0.035	1.000									
Age	-0.119	-0.348	1.000								
Off farm income	-0.370	-0.392	0.418	1.000							
Agricultural diversification	-0.200	0.309	-0.399	-0.549	1.000						
Farming experience	-0.361	0.270	-0.376	-0.362	0.514	1.000					
Credit experience	-0.500	0.151	-0.482	-0.165	0.316	0.405	1.000				
Multiple borrowing	0.088	-0.054	0.032	0.081	-0.075	-0.322	-0.073	1.000			
Farm visits	-0.467	0.030	-0.505	-0.005	0.209	0.364	0.471	-0.051	1.000		
Supervision	-0.103	0.212	-0.145	-0.201	0.170	0.091	-0.172	-0.352	-0.078	1.000	
Political verdict	0.173	-0.271	0.513	0.215	-0.385	-0.601	-0.442	0.153	-0.375	-0.052	1.000

**Table 4.27: Results of the logit model**

	B	S.E.	Wald
Gender	1.962	1.392	1.986
Age	-3.432	1.157	8.796**
Off farm income	-1.928	1.310	2.166
Agricultural diversification	1.312	0.694	3.579*
Farming experience	1.728	0.588	8.624**
Credit experience	1.075	0.451	5.685**
Multiple borrowing	-1.684	0.919	3.359*
Farm visit	2.081	1.117	3.469*
Supervision	1.817	1.062	2.928*
Political verdict	-3.893	1.395	7.785**
Constant	-1.699	1.929	0.775

\*\* Significant at 5 per cent

\*significant at 10 per cent

Logit: -2 Log likelihood = 43.64; Percentage correctly predicted = 86.4

Age variable was found to be statistically significant at 5% and negative. This implies that the more the borrowers' age advances, the less compliant they become in debt servicing. The likely reason is that young farmers are productive; hence they have the physical and mental capabilities to contribute to the growth of the project. They can take risk and are dynamic and independent. Youths are also audacious and innovative. Besides, young people in the area of study were found to have young families, which were easier to maintain. They also had few projects to take care of, thus they concentrated more on the current projects. In this case, it was hard to divert money, hence increasing the income of the client and subsequently loan servicing. These results conform to those of Ayanda and Ogunsekan (2012) whose study indicated that there was a significant negative relationship between the age of the farmers and loan repayment. They attributed this to the fact that younger respondents were more innovative, venturesome and energetic, which could translate into higher farm production and hence higher income through which the loan could be repaid. Conversely, older clients could perform less tedious farm activities which affected farm yield and income and hence farmer's inability to repay the loan. Other studies contradicted this finding and found age



to be significant and positive. For example, Awunyo-Vitor and Wongnaa (2013) studied loan repayment performance among yam farmers in Sene District, Ghana. He found that age was significant at 10% and had a positive influence. In addition, Ojiako and Ogbukwa (2012) from Nigeria and Reta (2011) from Ethiopia noted that age variations had a positive impact on loan repayment performance. The likely reason for their findings is that concentration and experience was gave the farmers an upper hand in the areas of study. In this case, older farmers possessed greater experience and longer concentration span.

The level of agricultural diversification of loan beneficiaries had a positive coefficient and was statistically significant at 10%. This implies that more activities cushion the farmer by reducing the risk profile associated with natural hazards and marketing elements. Therefore, the more the activities the farmer had, the more the compliance in debt servicing efficiencies. A multiplicity of farm uses depicts farm use efficiency which is associated with technology transfer. Similar findings were registered by Okpara *et al.* (2013).

The current study found that farming experience was positive and statistically significant at 5% level. The positive relationship meant that more years of farming brought about more conformity in debt servicing capabilities. The likely explanation is that farming experience could probably lead to proper utilization of agricultural loans and inputs, which had a positive effect on the magnitude of farm profit and consequently loan repayment ability. In fact, experience brings about stability in farming activities and reduces the risks associated with agricultural projects. This ensures that agribusiness is a going concern, the sustainability of which enhances credit servicing capabilities. The findings were consistent with those of Okpara *et al.* (2013). The positive relationship of farming experience was attributed to an improvement in managerial skill, which induced the need for more financial resources to further enhance profitability, in turn enhancing the repayment performance. As a further example, Awunyo-Vitor and Wongnaa (2013) established that farming experience was significant and positively related to yam farmers' ability to repay their loans.

Credit use was found to be positive and statistically significant at 5% level. The results reveal that more experienced farmers in borrowing knew how to use credit and as a result complied with debt servicing regulations. The explanation for this is that repeat borrowers were more acquainted with credit utilization for worthwhile purposes. Efficient and effective use of credit enhances farm income, which improves the debt servicing capacity. The other reason is that repeat borrowers wanted to protect their image and remain credit worthy so as to enable them to be graduated to the next higher loan in future. Repeat borrowers in the area of study were appraised based on repayment performance history. Therefore, repayment was found to improve with the frequency of taking a loan from a financial institution. Thus the study in conforms to the finding is by Abafita (2003) which revealed that experience in credit use was positive and significant, and was attributed to borrowers' acquisition of more experience on the institution's rules and regulations, and hence improving the likelihood of utilizing the loan for the intended purpose.

Multiple borrowing was established by the current study to have a negative effect at 10% level of significance. This means that a decrease in multiple borrowing increased compliance in loan repayment. The explanation for this phenomenon is the increase in the level of indebtedness caused by having many loans at the same time. This increased the commitment to many debts and divided the attention of the borrowers, thus increasing the default rate. This result contradicts the findings of Mwangi (2013) who studied the effect of competition on the loan performance of deposit-taking microfinance institutions in Kenya. She found multiple borrowing to be positive and statistically significant. Her study attributed this to increased debt obligation which affected loan performance of deposit-taking microfinance institutions in Kenya. The positive relationship of her results arises because an institution with more debts will be more competitive since it has funds to lend to its borrowers.

Farm visits variable was found to be positive and with a significant influence at 10% according to the current study. This means that an increase in the number of farm visits

increased compliance in debt servicing by the farmers. The probable explanation for the finding is that lack of lenders' presence causes more diversion of funds and as a result non-conformity in debt servicing sets in. This conforms to the findings of Awunyo-Vitor and Wongnaa (2013), who noted that the number of supervisory visits was positively related to yam farmers' ability to repay their loans. In his study, increasing the number of supervisory visits by one day increased the probability of a yam farmer's ability to repay loan by 24.9%. This means that the more the credit officers visit farmers to supervise how loan is used, the better the farmers' repayment abilities and vice versa. In addition, Arene and Aneke (1999) analyzed the position of women in the repayment of agricultural loans in Nigeria. The study revealed that farm visits by the supervisors had a positive and significant influence. Farm visits were found to be directly related to the farmers' gross income level. This implies that the supervised farmers' gross income increased as the supervisors' visits became more frequent. The explanation for this relationship was that frequent farm visits by the supervisors strengthened the farmers' confidence in the acceptance of new technology as well as solving technical problems. The cumulative effect was efficiency in debt servicing capacities.

According to the current study, the supervision variable was positively and significantly related to compliance (at 10%). This means that an increase in the level of supervision of borrowers brought about more compliance in credit servicing. Since agricultural lending is a supervised type of lending, lack of contact leads to diversion of funds because of failure to monitor the implementation and progress of the project. In addition, supervision of loan repayment ensures consistency in follow-ups of credit servicing. Supervision plays a critical role and its failure undermines the efficiency in debt repayment. Similar to the findings of this study were results by Ejike *et al.* (2013) which showed that supervision had a positive effect on the credit supplied, indicating that an increase in supervision resulted in an increase in credit supplied, leading to more conformity in loan repayment. These findings are also consistent with those of Okorie (1986) who examined the major determinants of agricultural smallholder loan repayment in Ondo State, Nigeria. He identified the nature and timeliness of loan disbursement and the number of supervisory visits by credit officers as significant factors that stimulate loan repayment.

According to him, routine visits help put farmers on track and monitor the proper use of the loan. These studies revealed that, with adequate loan supervision, the probability of using loan funds for non-intended purposes decreased. As such, borrowers observed their obligations and improved credit utilization, thereby improving repayment performance.

Divergent findings were however registered by Abafita (2003) who established supervision to be negative and statistically significant. The likely reason for this finding is that when a lending institution supervises another, this is perceived by the supervisee as an interference and denial of liberty to implement its mandate and structures.

Political verdict was found to have a significantly negative effect at 5% to borrowers in the area of study. The impact was to a large extent the determinant of moral hazard which contributed to strategic default of loan. The negative effect of the variable implies that political utterances are effective and provocative to beneficiaries of the scheme loan. This follows that borrowers who concur with politicians' opinions deliberately refuse to service their debts, even though able, in anticipation of government waiver. Other studies have established that cheap sources of funds from government, international institutions and donations will not guarantee success and sustainability since it may only be a tool for politicians to gain electoral support (Yaron *et al.*, 1997). Government interventions could reduce the autonomy of lenders since they have to comply with the government's policy (Sacay *et al.*, 1995). The government may also control by putting pressure to expand its network in the rural areas and expand credit to priority sectors without paying sufficient attention to loan recovery (Khandker and Shahidur, 1998). Further, the government may impose interest rate ceilings. These interest rates on government directed agricultural credit are usually fixed below market rates. Subsidized rates lead to rationing, which tends to favour the wealthy and politically connected and borrowers might not take the loans seriously enough (Muraki and Tetsutaro 1997). Interest payments are often remitted or loans are written off for political reasons, which may create a culture of default (Khandker and Shahidur, 1998).

#### **4.4 CONCLUSION**

The analysis of data from the area of study established a default rate of 37%, which is the highest in the country as per the AFC records. Evidence from descriptive statistics and regressions indicate that certain factors within the context of farmer/farm specific and lender/facility issues significantly affect the probability of defaulting of loan by the beneficiaries. The implication is that both endogenous and exogenous aspects contribute to loan repayment challenges in a developing nation like Kenya. Descriptive statistics were used to analyze the factors that affect the default rate in a government sponsored agricultural scheme loan. The variables that were analyzed can be put into three categories. They are socio-economic profile of the borrower, lender characteristics and external environment characteristics. Out of the 16 variables that were analyzed, ten factors were borrower related namely: gender, age, education, off farm income, credit experience, farming experience, funds use, primary occupation, adoption of technology, and agricultural diversification. Four factors fell under the category of lender related embrace: supervision, farm visits, loan making efficiency and suitability of loan scheme. Two variables considered external to the environment of the borrower and lender were the political environment and land dynamics. Land issues though viewed as personal in ordinary situations are regarded as external in the current study due to interventions from the public and government and also due to norms and beliefs that are attached to land.

The results of descriptive analysis revealed some factors to have a greater influence on debt servicing than others. These factors include gender, age, farming experience, credit use experience, multiple borrowing, supervision, farm visits, politics, technological issues and land dynamics. The last three factors have a spill over effect on other factors and need the intervention of policy makers so as to remedy the situation. Some of these variables were used to run a logit regression to test their level of significance direction of influence. Four variables were found to be statistically significant at 5%. These include age, farming experience, credit use experience and politics. Another four variables were found to be statistically significant at 10%. These are agricultural diversification, multiple borrowing, farm visits and supervision. It is therefore important to carefully consider the

variables which were found to be significant while redesigning a credit model for agricultural loans.

## **CHAPTER FIVE**

### **5. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 SUMMARY, FINDINGS AND CONCLUSIONS**

This study examined the causal factors impacting on loan default among the beneficiaries of government agricultural loans channelled through AFC in Machakos County. During the period under study, a high default rate of 37% among the beneficiaries was registered, which is the highest in the country as per the AFC records. This can be attributed to poverty levels and nature of agricultural business which is fraught with uncertainties and risks.

Descriptive statistics were used to analyze the factors that affect the default rate of agricultural loans in the area of study. In addition, a logit regression was run to test the level of significance where four variables (age, farming experience, credit use experience and politics) were found to be statistically significant at 5% while other four variables (agricultural diversification, multiple borrowing, farm visits and supervision) were found to be statistically significant at 10%. It is therefore imperative to carefully consider the variables which were found to be significant while redesigning a credit model for farm loans. The future of lending in agricultural credit lies in recruiting applicants who are young and non-political but experienced in both farming and credit use. Besides, it is worthwhile to enrol applicants who are techno-savvy so that they can easily deal with emerging issues in agribusiness such as diversification. Clients who have been rendered over-indebted due to multiple borrowing should have their applications deferred until they clear a reasonable amount which reduces their debt servicing ratio. Finally, appointments at farmers' communes should be made a routine as long as the loan is in gestation so as to consistently monitor and advise the loan beneficiaries.

## **5.2 RECOMMENDATIONS**

Based on the findings of this study, the recommendations given below are suggested in order to reduce default rate for agricultural loans that are channelled through AFC office in Machakos County:

- **Create special agricultural loans for youth**

Credit stakeholders should be put in place policies that would make credit facilities more youth friendly, attracting the youths to live in the rural areas and engage in agribusiness as a means of livelihood. A good example would be re-invigoration of the young farmers' club such as 4K club and making agriculture a compulsory subject in both primary and secondary schools.

- **Improve training programs for farmers**

Training of farmers especially on technology, diversification and input use efficiency should be done through well-articulated agricultural extension programs using different forums such as media and field days. This will facilitate the acquisition of experienced knowledge on both farming and use of credit for productivity and development. Information regarding production processes and marketing will change the attitude of the society and create a paradigm shift in agriculture from adoption of conventional approaches dimension to investing in applied research which has a commercial orientation. Through this bearing climate- smart farming is achievable due to development of locally adapted crops and animals that are hardy to resist bad weather.

- **Implement thorough screening of the loan applicants**

Lenders should scrutinize borrowers in all dimensions to evaluate and militate against the possibility of default. Through desk screening the lender will be able to identify prospects that are political or hail from regions where politics has a great impact on debt servicing and avoid picking them; the capacity, character and attitude. Issues that vetting will shed light on include multiple borrowing, farming experience, experience in credit use, the occupation of the borrower, off farm income and project viability. Credit scoring method is useful because it saves times and enhances credit access under fair and just conditions,



thus applicants are qualified on the basis of meritocracy. An example of scoring is use of credit reference bureau (CRB) which provides rating and instils serious atmosphere of repayment discipline.

- **Diversify agricultural programmes for marginal areas**

Beneficiaries of government scheme loans should be empowered to adopt a paradigm shift from subsistence farming to commercially oriented agriculture. This involves investment in agribusiness by adoption of suitable farming technology such as use of drought resistant seeds, green house technology, irrigated agriculture and a multiplicity of farm use especially in dry areas. The government should step up efforts to increase the level of income of farmers in remote areas through production and marketing efficiencies; livestock off take loans especially for farmers and institutions with large tracts of land such as South Eastern Kenya University (SEKU); provision of water and infrastructure; injection of subsidy in prices of inputs for loan borrowers and assist farmers to market their products and also buy from them at good prices through National Cereals and Produce Board (NCPB).

- **Increase farm appointments**

Farm visits and supervision should be intensified so as to keep the farmer and the lender in touch and improve the farmers' income levels and loan repayment. Since farm loan is categorized as a supervised credit, then agricultural lending and farm visit are inseparable. Thus, credit officers should be given incentives to encourage them to make more visits. A close and friendly contact between officials and farmers will create expediency which facilitates training and demystifies the terms and conditions of the loans, disbursement procedure and repayment schedules.

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## APPENDIX 1: SURVEY QUESTIONNAIRE

### DETERMINANTS OF LOAN REPAYMENT PERFORMANCE: A CASE OF AGRICULTURAL FINANCE CORPORATION, MACHAKOS COUNTY

#### A. Personal Details

1. Sex  Male  Female

2. Age \_\_\_\_\_

3. What is your education level?

Primary Level  Secondary Level

Tertiary Level  Certificate  Diploma  Degree

Postgraduate Level  Masters  PhD

OTHER \_\_\_\_\_

4. Marital status

Single  Married  Divorced  Widowed

5. Total number of family members (Family size) \_\_\_\_\_

Age 0 to  $\leq 5$  Male \_\_\_\_\_ Female \_\_\_\_\_

Age  $>5$  to  $\leq 14$  Male \_\_\_\_\_ Female \_\_\_\_\_

Age 14- 20 Male \_\_\_\_\_ Female \_\_\_\_\_

Age 21- 40 Male \_\_\_\_\_ Female \_\_\_\_\_

Age 41- 60 Male \_\_\_\_\_ Female \_\_\_\_\_

Age 61- 70 Male \_\_\_\_\_ Female \_\_\_\_\_

Age 70 and above Male \_\_\_\_\_ Female \_\_\_\_\_

6. Number of dependents out of the household: \_\_\_\_\_

Age 0 to  $\leq 5$  Male \_\_\_\_\_ Female \_\_\_\_\_

Age  $>5$  to  $\leq 14$  Male \_\_\_\_\_ Female \_\_\_\_\_

Age 14- 20 Male \_\_\_\_\_ Female \_\_\_\_\_

Age 21- 40 Male \_\_\_\_\_ Female \_\_\_\_\_

Age 41- 60 Male \_\_\_\_\_ Female \_\_\_\_\_

- Age 61– 70 Male \_\_\_\_\_ Female \_\_\_\_\_
- Age 70 and above Male \_\_\_\_\_ Female \_\_\_\_\_

**B. Borrower related questions**

1. What is your profession? \_\_\_\_\_
2. What is your occupation? \_\_\_\_\_
3. (a) Apart from your occupation listed in (2) above, do you have other sources of income.

i) Yes.....ii) No.....

If Yes, list them below: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

(b)How much is your total annual income from each of the above in Ksh.

- i) \_\_\_\_\_Kshs.....
- ii) .....Kshs.....
- iii) Kshs.....
- iv.....Kshs..
- v) Others (specify) .....Kshs.....

(c)How much is your total annual expenditure? \_\_\_\_\_

4. (a) Do you take part in any agricultural/agribusiness activity?

i) Yes.....ii) No.....

If Yes, List them below:

Activity	Years of experience
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

(b) Which particular project did you borrow funds for? \_\_\_\_\_

(c) Did you conduct market study (survey) before starting this undertaking?  Yes  No

5. (a) Which category of enterprise are you running using funds borrowed from AFC?

- Crop       Animal       Mixed crop and animal farming       Trade in livestock / products/inputs       Trade in crops / products / inputs Use of Artificial insemination

(b) If your category is crop farming, tick where applicable?

- Rain fed       Irrigated       Plant seeds from the farm       Buy certified seeds  Grow crops in open seed bed       Grow crops in green house  Others

\_\_\_\_\_

(c) If your category is livestock rearing, tick where applicable?

- Raised in Zero Grazing Unit       Animals are grazed       All animal feeds are from the Farm       Some or all feeds are purchased       Uses a bull from the farm for breeding       Integrate crops with livestock  Integrate livestock with livestock

Others \_\_\_\_\_

\_\_\_\_\_

6. How many times have you ever borrowed from the following sources?

i) AFC \_\_\_\_\_

ii) bank (Specify) \_\_\_\_\_ iii) Other sources (specify) \_\_\_\_\_

7. Do you have any other loan in addition to the AFC loan? \_\_\_\_\_

8 (a) How much money did you borrow from AFC? \_\_\_\_\_

(b) How much was disbursed? \_\_\_\_\_

(c) How long did it take from loan application to disbursement?

\_\_\_\_\_

(d) Were you given a 3 months grace period?       Yes       No

(e) How long is/was the repayment period? \_\_\_\_\_

(f) Did you spend the entire disbursed loan for running the project?       Yes       No

(g) If No in (e) above, for what purpose did you spend?       Domestic consumption

Education for children       Health

Others \_\_\_\_\_ (specify)

\_\_\_\_\_



10 (a) Do you feel the amount of loan taken from AFC was adequate for the planned farming project?      Yes No

(b) If No in (a) above, what option did you take?

- None I just used the available amount of money
- Borrow from Microfinance institutions
- Borrow from family or friends
- Borrow from informal money lenders
- Borrow from formal banks
- Others (specify)\_\_\_\_\_

11(a) Do you service a loan from another source jointly with AFC loan?  Yes No (b) which loan do you give repayment priority?  AFC  Other

(c) Give reasons for (b) above \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

12. What was your first source of information about AFC?

- Internet
- A friend
- Ministry of Agriculture
- Media advertisement
- AFC officers in the field/ training meeting
- AFC officers during annual show
- Other(s)

(specify)\_\_\_\_\_

13. What is the location relationship between project farm, security farm and your home of residence?

- The project farm is similar to security farm but the home located differently
- The project farm is similar to home farm but the location of security is separate
- The security farm is the home of residence but the project farm is separate

- The farm used for the three purposes is similar are similar
- Each farm is used for its own specific purpose

14. What is the status of ownership for firm enterprise to be used for farming project purposes?

- Individual ownership
- joint ownership
- leased land

15. What is the distance from your project farm to nearest AFC office? \_\_\_\_\_

16. What is the total size of your project farm(s) in hectares? \_\_\_\_\_

17. Where is the market for the produce from the project farm?  Farm gate

Local market: How far? \_\_\_\_\_

International market: Which country(s)? \_\_\_\_\_

\_\_\_\_\_

13. How far is your place of residence whether permanent or temporary to AFC office?

\_\_\_\_\_

### **C. Institutional aspects**

1(a) is the repayment scheme set by AFC suitable?  Yes  No

(b) If No in (a) above, what are the reasons?

- The starting time to repay is too early
- The repayment period is short
- The amount of repayment in each month is too much
- Others \_\_\_\_\_

2. What do you suggest to make the AFC repayment scheme suitable and more relevant?

- To give enough time before starting to repay
- To make the repayment period longer
- Others

(specify) \_\_\_\_\_

3. How do you perceive the interest rate for credit set by AFC?

- High
- Medium
- Low

4. (a) Have you ever participated on any training from AFC?  Yes  No

(b) If Yes, Specify the name of the training, year and venue \_\_\_\_\_

5. (a) Have you been visited by AFC officials since the time of loan disbursement?

Yes  No

(b) If Yes in (a) above, what was the purpose(s) of the visit?

Training

Free advice

Post disbursement verification

Farm demonstration purposes

Monitor the progress of the project

For loan collection and / or farm inspection

Others \_\_\_\_\_

(c) Tick where applicable if any of the stakeholders listed has visited you within the year for any of the reasons in (b) above

Ministry of agriculture  NGOs  Community Based Organizations

Church Based Organization  Others (specify) \_\_\_\_\_

#### **D. Loan Repayment related questions**

1. Which method of loan repayment do you use?

Cash remittance  Bank order  Salary deduction order

2. Is loan and repayment supervision made by AFC loan officers throughout the process (from loan disbursement to final repayment date)?  Yes  No

3. (a) Do you service the loan facility as per the terms in loan offer?  Yes  No

(b) If No in (a) above, what are the reasons?

Lack of and/or inconsistent follow up by AFC loan officer

Weak legal enforcement for defaulters

Diversion of loan funds

Collapse of the project

Others \_\_\_\_\_

4. a) Do area leaders talk about agricultural loans as they address meetings?  Yes  No

(b) If Yes in (a) above, do they promise to push for loan write offs?  Yes  No

b) If Yes in (b) above, what reasons do they give to justify their arguments?

- Prevalence of bad weather
- Destruction of the project by diseases and pests
- Poverty is high among the residents
- Lack of market for farmers' products
- Government money should be free
- Lack of or little government intervention in agricultural projects
- Others \_\_\_\_\_

(d) Do area politicians' use write off as a tool during campaign periods?  Yes  No

(e) Do you support the politicians move against loan repayment as per the terms of offer?

Yes  No

5. (a) Have you benefited in any way by fully repaying your loan?  Yes  No

(b). If yes in (a) above, what are the benefits?

- Access to the next higher loan
- Build good relationship with the loan provider
- To make the family stable

Others \_\_\_\_\_