

**Determinants of agricultural loan repayments: the case of MAFISA
funded farmers in uMkanyakude, KwaZulu-Natal province, South
Africa.**

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Abstract

The Micro Agricultural Financial Institutions of South Africa (MAFISA) was established by the South African government in 2005 to provide production loans to smallholder farmers in all nine provinces of South Africa. This study examined the socio-economic and loan factors that influence loan repayment of MAFISA-funded farmers in umKanyakude district municipality. Using data from 191 selected loans granted by Peulwana Agricultural Financial Services (PAFS), the study employed a logit model to identify the explanatory for loan default. The study found that age, gender and education were not significant in determining loan repayment. On the other hand, land size, loan cycle and loan amount were significant in influencing loan repayment.

The results of the empirical analysis have three main policy implications for the government and the microfinance institutions. Firstly, smallholder farmers should be supported to increase their ownership of land size so that they can plant more crops and increase their sales. This will enable them to improve their repayment rate. Secondly, smallholder farmers should be provided with smaller loan amounts at first as it leads to good repayment. Thirdly microfinance institutions should provide more loans to lenders on a second or more cycle as this leads to good repayment.

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List of tables

Table 1.....	19
Table 2.....	22
Table 3.....	35
Table 4.....	36
Table 5.....	37
Table 6.....	38
Table 7.....	38
Table 8.....	39
Table 9.....	39
Table 10.....	40
Table 11.....	40
Table 12.....	41

List of figures

Figure 1.....	50
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List of abbreviations

KZN	KwaZulu-Natal
MAFISA	Microfinance Institutions of South Africa
MFI	Microfinance Institution
NERPO	National Emergent Red Meat Producer's Organisation
KZN	KwaZulu-Natal
PAFS	Peulwana Agricultural Financial Services
SASA	South African Sugar Association
SMME	Small and Micro Enterprises

TABLE OF CONTENTS

Determinants of agricultural loan repayments: the case of MAFISA funded farmers in uMkanyakude, KwaZulu-Natal province, South Africa	i
Plagiarism Declaration	ii
Abstract	iii
Acknowledgements.....	iv
List of tables	v
List of figures	vi
List of abbreviations.....	vii
TABLE OF CONTENTS.....	viii
CHAPTER 1 INTRODUCTION	1
1.1 Background of the study	1
1.2 Problem statement.....	1
1.3 Research questions and objectives	2
1.4 Research hypothesis.....	3
1.5 Justification of the research	3
1.6. Limitations of the research.....	4
1.7 Organisation of the study.....	4
CHAPTER 2 LITERATURE REVIEW	5
2.1 Introduction.....	5
2.2 Definition of terms and concepts	5
2.2.1 Microfinance and Microcredit.....	5
2.2.2. Rural finance	5
2.2.3 Delinquent loan and loan default.....	5
2.3 History of microfinance	5
2.4 Models of Microfinance	6
2.4.1 Group lending.....	6
2.4.2 Individual lending.....	7
2.4.3 Credit unions	7

2.4.4	Self-help groups	7
2.5	Characteristics of microfinance.....	7
2.6	Overview of farming and Mafisa in KwaZulu-Natal.....	7
2.6.1	Overview of farming in KwaZulu-Natal	7
2.6.2	Overview of Mafisa funding in KwaZulu-Natal	8
2.7	Theoretical framework of loan repayment	9
2.7.1	Theory of rural credit market	9
2.8	Determinants of loan repayment.....	11
2.9	Empirical literature review	12
2.9.1	Socio economic characteristics.....	12
2.9.2.	Lender characteristics or institutional factors.....	15
2.9.3.	Loan characteristics	16
2.10	Chapter Summary.....	17
	CHAPTER 3 RESEARCH METHODOLOGY.....	19
3.1	Introduction.....	19
3.2	Data and sample size.....	19
3.3	Analytical framework	19
3.3.1	Regression equation and estimation techniques	20
3.3.1	Estimation techniques.....	20
3.4	Definition of variables	22
3.4.1	Age of the farmer	22
3.4.2	Gender of the farmer	22
3.4.3.	Educational level of the farmer	22
3.4.4.	Loan amount.....	23
3.4.5.	Loan cycle	23
3.4.6.	Size of the land.....	23
3.5	The research process.....	24
3.6	Chapter summary	25
	CHAPTER 4 DISCUSSION OF FINDINGS.....	26
4.1	Introduction.....	26

4.2	Descriptive statistics.....	26
4.3	Demographics and Default Status.....	28
4.3.1	Age and default status	28
4.3.3	Gender and default status	28
4.4.4	Educational level and default status	29
4.4.5	Loan Cycle and default status.....	29
4.4.6	Loan amount and default status	30
4.4.7	Land size and default status.....	30
4.4	Regression Results.....	30
	CHAPTER 5 CONCLUSIONS AND RECOMMENDATIONS	34
5.1	Introduction.....	34
5.2	Summary of the study	34
5.3	Policy recommendations	35
5.4.	Avenues for future research.....	36
	References:	37
	Appendix 1	42

CHAPTER 1

INTRODUCTION

1.1 Background of the study

The Micro Agricultural Financial Institutions of South Africa (MAFISA) was established by the South African government in 2005 to provide production loans to smallholder farmers in all nine provinces of South Africa (Gauteng, Western Cape, Free State, KwaZulu-Natal, Mpumalanga, Northwest, Northern Cape and Limpopo). The reason for the establishment of the scheme was that formal financial institutions like banks did not have appetite to finance smallholder farmers. The reasons for lack of appetite include high transaction costs, high risk, lack of collateral, unstable income, lower literacy levels and high monitoring costs (Nawai, 2010). The scheme was established from a once-off allocation of R1 billion from the government of South Africa and was expected to sustain itself through interest earned from funds in the bank, interest earned from recovered loans, and loan repayments from smallholder farmers. The government was not directly involved in providing loans. They appointed nine retail intermediaries who provided loans directly to the smallholder farmers. The loans offered to smallholder farmers range from R10 000 to R500 000. The loans cover production inputs and small equipment. The initial maximum amount was R100 000 and was increased to R500 000 in 2015 (Mafisa 2015). From inception to 31 March 2018 a total amount of R415 million has been disbursed to smallholder farmers (Mafisa 2018). Of the R415 million disbursed R215 million has been repaid, which is a 50% repayment rate. (Mafisa 2014). However, the repayment rate in KwaZulu-Natal has been far better than the national figure as it has ranged from 65% in 2010 to 94% in 2018. The reason for the variance is that most of the funded farmers in KwaZulu-Natal farm sugar cane, which is a tight value chain with no opportunity for side-selling. The intermediaries also take cessions from millers in the area, which helps to improve the repayment rate.

Initially MAFISA funds were made available to intermediaries at 1% interest and intermediaries were to retail the loans at 8% to smallholder farmers.. The 1% is added back to the fund while the 7% is retained by the intermediaries as service fee. However, with the pressure to make loans affordable to the producers, the funds were given to intermediaries at zero interest and the intermediaries are to retail the loans at 7% interest rate. From 2015 intermediaries receive 8% of the loan value as their repayment.

1.2 Problem statement

Prior to 1994 South Africa relied on the Land Bank and the Agriculture Credit Board to provide financial support to farmers. After 1994 the Strauss commission recommended that the ACB board be dissolved. This commission recommended the establishment of the Comprehensive

Support Programme (CASP) in order to cater for the financial , infrastructure , marketing and extension needs of smallholder farmers who could not access these services from the formal financial institutions because they could not qualify as they are perceived to be very risky.

Mafisa was established as a pillar that would provide the financial needs of smallholder farmers. Although Daff was not directly involved in the assessment of clients and the disbursement of funds to the smallholder farmers it was marketed as a government scheme .As a result the farmers are aware that the funds come from government.

Besides Mafisa loans government also provided grants to smallholder farmers . Those farmers who receive grants do not have to repay anything to the government. As a result the Mafisa scheme experience ‘strategic defaults’”where those farmers who are able to pay decide not to pay as they argue that it is government money and that some smallholder farmers receive grant which they are non supposed to repay.

Mafisa has a total loan book of R400 million. As of 31 March 2018, the repayment rate was 50% (Mafisa 2018). The scheme is a revolving fund and if repayments are low it implies that other farmers will not be able to get loans in the future. Low repayments may also lead to the closure of the scheme as funds can dry up. If that happens, government will no longer be able to assist smallholder farmers with credit for production inputs and this will hamper its initiative to create jobs, revitalise rural areas and provide food security. On the other hand, smallholder farmers and intermediaries may lose their source of livelihoods.

According to Nanayakkara and Stewart 2015 : 322)

“the success of microfinance institutions to alleviate poverty depends on their repayment performance, because a high repayment rate indicates that the majority of clients have invested in useful assets that generate income sufficient for themselves, as well as to enable them to make repayments. In addition, it also improves the sustainability of the MFI; enabling it to reduce interest rates or offer services to more poor borrowers. Lastly, a loan portfolio with a high repayment rate attracts additional external funding.”

1.3 Research questions and objectives

The research will answer the following questions:

- (a) What is the rate of loan repayments of Mafisa-funded farmers in uMkanyakude, KwaZulu-Natal?
- (b) What are the socio-economic and loan factors that affect Mafisa loan repayments in uMkanyakude, KwaZulu-Natal province?

The general objective of this study is to determine factors that influence Mafisa loan repayments in uMkanyakude, KwaZulu-Natal (KZN). From the above research questions, the objectives are;

- (a) To examine the loan repayment rate among Mafisa-funded farmers in KZN.
- (b) To examine the effect of age, gender, education, loan amount, loan cycle and number of hectares on loan repayments of Mafisa-funded farmers in KZN.

1.4 Research hypothesis

The study will test the following six null hypotheses:

H₁ Age does not have any significant effect on Mafisa loan repayments.

H₂ Gender does not have any significant effect on Mafisa loan repayments.

H₃ Education does not have any significant effect on Mafisa loan repayments.

H₄ Loan amount does not have any significant effect on Mafisa loan repayments

H₅ Loan cycle does not have any significant effect on Mafisa loan repayments.

H₆ Land size does not have any significant effect on Mafisa loan repayments.

1.5 Justification of the research

Baklouiti (2013) pointed out that loan repayment for microfinance institutions is an important field of study. This is due to the fact that microfinance institutions lend to the poor, which requires that terms of lending should be made easy in order to increase access. This poses challenges for lenders as the borrowers are riskier because they do not have collateral.

According to Nanayakkara and Stewart (2015:322)

“the success of MFIs in their effort to alleviate poverty depends on their repayment performance. In the first place, a high repayment rate is a sign that borrowers have invested in useful assets that generate incomes sufficient for themselves as well as enabling repayments. Furthermore, a high repayment rate increases the sustainability of the MFI and also enables it to reduce interest rates or offer additional services to borrowers. Thirdly, loan portfolios with high repayment rates attract more funding. The fact that there are millions of dollars that are invested in microfinance every year makes research into factors that affect repayment for MFIS interesting and important.”

Government may use the research to improve policies when they design loan schemes and lenders may use the results of the study to improve the repayment rates of their loan schemes, which is important for sustainability. If the loan scheme targets smallholder farmers with the correct

attributes, its sustainability will be improved, and this implies that government will not be required to provide additional, scarce resources. On the other hand, intermediaries will continue to operate their enterprises and smallholder farmers will benefit from sustainable and targeted financial support informed by empirical evidence. Beneficiaries will benefit from government policies that are informed by farmers' needs. Researchers may use it to identify gaps that may assist them to conduct future research studies in the same area.

There are very few studies that have been conducted on the determinants of loan repayments in South Africa. As a result, there is a need to determine if findings from other countries also apply to South Africa.

1.6. Limitations of the research

The research has only been conducted in the district municipality of uMkanyakude, KZN province on Mafisa-funded farmers by Peulwana Financial Services. Based on that, the results do not apply to all 44 district municipalities in South Africa. This was based on cost and time considerations. Some information on the age of the farmers was missing on the list provided and this may have an impact on the findings. This study did not cover the following variables which may also affect loan repayments : “availability of collateral and guarantees; transport availability in the area; whether the borrower is a group or individual; purpose for which the loan is used; time to approve and disburse the loan; visiting frequency by loan officers; whether training is provided to the borrowers; and, the attitude of borrowers to loan repayment”, Nanayakkara and Stewart (2015).

These variables were not considered because time and financial resources for this study were limited.

1.7 Organisation of the study.

The dissertation consists of five chapters which have been organised as follows:

- Chapter 2 provides the history of microfinance, models of microfinance, overview of farming in KZN, the theoretical framework of loan repayment and empirical literature review.
- Chapter 3 covers the research methodology under the following sub headings: sample size, analytical framework and the estimation technique.
- Chapter 4 presents the research findings, covers descriptive statistics, chi square test and the logit regression analysis.
- Chapter 5 provides a summary of the study, conclusions and policy recommendations.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter will define terms and concepts that are relevant for microfinance; it will also cover characteristics of microfinance, the history of microfinance, models of microfinance as well as causes of loan default. After that it will provide an overview of Mafisa funding, the theoretical framework for loan repayment and the empirical literature review. It will conclude with a summary.

2.2 Definition of terms and concepts

2.2.1 *Microfinance and Microcredit*

Robinson (2001,p.59) defined microfinance as “small-scale financial services, primarily credit and savings provided to people who farm or fish or herd, who operate small enterprises or microenterprises where goods are produced, or recycled, repaired or sold, who provide services, who work for wages or commission, who gain income from renting out small amounts of land, vehicles, draft animals, or machinery and tools, and other individuals and groups at the local levels of developing countries, both rural and urban. Many such households have multiple sources of income.”

Abor (2017,p.116 defined microcredit as the provision of micro loans to those with low incomes and households with little or no collateral. These borrowers have a challenge in accessing credit or loans from the traditional or formal financial institutions. Microfinance is a broad term that covers microcredit, micro-insurance and savings. Microcredit is the lending arm of microfinance. Based on the definitions provided above, microfinance involves the provision of small loans, insurance, and savings mobilisation to small and micro-enterprises (SMMEs)

2.2.2. *Rural finance*

Robinson, (2001,p.10 defined rural finance as

“financial services that are used in the rural areas by people of all income groups”

2.2.3 *Delinquent loan and loan default*

Delinquent loan refers to a loan that a lender has written off Norell 2001, p. 116) and loan default happens when the borrower has failed to meet his or her legal obligations according to the debt agreement, or fails to repay the loan (Addae-Korankye 2014)

2.3 History of microfinance

Rahman (2010,p.6 provided the history of microfinance based on the following ten stages:

“The stages were grouped as follows: the beginning of time, the middle ages, the 1700s, the 1800s, 1950 to 1970, the 1980s, the early 1990s, and the millennium (current period). Since the beginning of time informal savings and credit groups have operated for centuries across the developed world. During the middle ages an Italian monk created the first official pawn shop in 1462. In 1515, pawnshops were empowered to charge interest so that they could cover their operating costs.”

According to Rahman (2010,p.7)

“Jonathan Swift started the Irish Loan Fund system in the 1700s, which provided micro loans to poor farmers who had no collateral (security). In the mid-1800s Friedrich Wilhelm Raiffeisen and his supporters developed the concept of the financial cooperative in Germany. This movement later expanded into other continents (Europe, North America and developing countries). During the period 1950 to 1970 development finance institutions were used to disburse concessional loans and on-lend to customers at below market rates. These DFIs lost money as the subsidized lending rates could not cover their operating costs.”

“In the early 1970s loans were extended to groups of poor women to invest in micro-enterprises. Examples are Grameen Bank of Bangladesh and Accion International, which was started in Latin America. In the 1980s microcredit programs improved on their methodologies. They charged cost recovery interest rates and achieved high repayment rates. This enabled them to achieve long-term sustainability and to reach a large number of clients. In the early 1990s microcredit was replaced by microfinance, which includes savings, insurance and money transfers. In the millennium, the borders between traditional microfinance and the larger financial system started to blur. Banks and other players in other countries entered the microfinance space”.

2.4 Models of Microfinance

According to Murray and Boros (2002) the majority of micro financial institutions use the group lending model. Other models that are utilised are the following: Individual lending, credit unions village banking and self-help groups. Abor (2017) also identified similar models of microfinance.

2.4.1 Group lending

In this model the financial institution grants loans to group members instead of an individual. The group assumes joint responsibility for a loan repayment. The group members exert peer pressure on each other to ensure repayment and, in case of default, the whole group is liable for repayment. The best-known example of this model is the Grameen Bank in Bangladesh (Abor 2017)

2.4.2 Individual lending

The financial institution lends money to an individual who assumes responsibility for a loan repayment. The responsibility to repay the loan rests with the individual and not the group.

2.4.3 Credit unions

These are organisations that are based in the local communities and collect savings and provide short-term credit (Murray and Boros 2002) Loans are based on the savings and, as a result, the demand for loans always exceeds supply.

2.4.4 Self-help groups

Most of these associations are formed by women. Members save an agreed amount on a monthly basis and this money is saved in a common pool. Members are allowed to borrow from the common pool, but they should repay that capital with interest. In South Africa, an example is the Stokvel. In other parts of the world, these groups are known by different names: e.g., Tontines in west Africa. The Grameen Bank succeeded in improving women's economic status and also empowered them. Women were enabled to contribute income to the family and that helped to improve their self-worth (Mokhtar, 2011).

2.5 Characteristics of microfinance

Murray and Boros (2002) identified the following characteristics of microfinance. Firstly, the amounts of loans and or savings are small. In addition, microfinance provides short-term loans and payment schedules are structured in the form of frequent instalments (or frequent deposits). Repayments are comprised of interest and the capital amount. Interest rates are high compared to commercial banks and it is relatively easy to access a microfinance institution. Microfinance makes use of simple application forms that are easy to complete, and they also process application forms in shorter periods compared to commercial lenders. Repeat clients who pay on time are offered higher amounts of credit and lastly, microfinance does not require collateral, contrary to formal lending institutions.

2.6 Overview of farming and Mafisa in KwaZulu-Natal

2.6.1 Overview of farming in KwaZulu-Natal

KwaZulu-Natal has a larger area of high-quality agricultural land compared to other provinces in South Africa. It also ranks first on several agricultural products. A significant percentage of South African small-scale farmers are based in KwaZulu-Natal (17%). According to Kzn topbusiness (2018) "the high-quality agricultural area is found between Pietermaritzburg and the Drakensberg. Another area with high quality agricultural land is the North coast region. The province has a total of 6,5 million hectares of land of which 82% is suitable for livestock farming and 18% is arable land."

The agricultural sector is mainly focused on the following crops: sugar cane, Maize, subtropical fruits, cashew nuts, bananas, potatoes, vegetables and forestry. The province is also well-known for animal husbandry (beef, sheep, poultry and pig farming). Dairy farming is also an important sector in KwaZulu-Natal. Dairy farming is found in areas around Richards Bay, Empangeni, Durban and Pietermaritzburg. It is also found in inland areas ranging from Ulundi, Vryheid, Newcastle, Ladysmith and Estcourt. The Highveld and the midlands areas are the main beef production areas. Sheep farming is mainly found along the Drakensberg, Vryheid and Southern Natal.

“The largest chicken producer - Rainbow - is located in Westville, KwaZulu-Natal. It employs more than 7000 people in its agricultural, feed milling, processing and service facilities. The two largest forest companies (Sappi and Mondi) are found in KwaZulu-Natal. Timber accounts for 6,5% of Kwazulu-Natal’s agricultural output. KwaZulu-Natal is the heart of the sugar industry in South Africa and contributes between 0,5% and 0,7% of the national gross domestic product. The most important agricultural land for sugar cane lies alongside the KwaZulu-Natal south coast. The Hluhluwe region of KwaZulu-Natal produces more than 90% of South Africa queen pineapples, which are exported to Europe”, Kzn topbusiness (2018)

2.6.2 Overview of Mafisa funding in KwaZulu-Natal

Mafisi operates in KwaZulu-Natal alongside the Land Bank and Ithala bank. However, smallholder farmers prefer Mafisa because of the shorter time it takes to finalise an application. Most of the smallholder farmers need funding for production inputs. The two banks also require collateral from smallholder farmers who are unable to provide it.

In KwaZulu-Natal MAFISA operates through three (3) institutions and these are the South African Sugar Association (SASA), Peulwana Agricultural Financial Services (PAFS) and the National Emerging Red Meat Producers Organisation (NERPO). SASA is based in KwaZulu-Natal and provides funding to sugar cane farmers. NERPO is a livestock commodity organization that focuses on support to livestock farmers in all provinces of South Africa including KwaZulu-Natal.

PAFS is a private organization proving funding to agricultural enterprises. PAFS provides funding to various agricultural enterprises such as horticulture, grains, vegetables, sugar cane and poultry. PAFS has also funded agro-processing activities. PAFS is the only Mafisa intermediary that operates in Ilembe and uMkanyakude district municipalities. Table 2.1 below provides a summary of Mafisa repayments in KwaZulu-Natal from 2007/8 to 2017/18.

Table 1: PAFS loan repayments

Year	Disbursed (R million)	Repaid (R million)	Beneficiaries	Jobs	Repayment as % of disbursements
2008/9	0.00	0.00	0.00	0.00	0
2009/10	R 7.98	0.00	330	0.00	0
2010/11	R 9.84	R 6.45	472	951	65
2011/12	R 7.06	R 6.40	544	2701	90
2012/13	8.01	R 5.60	690	1280	69
2013/14	R 13.84	R 6.56	1576	381	47
2014/15	R7.38	R 6.63	798	101	89
2015/16	R 8.35	R 6.05	690	262	72
2016/17	R 11.33	R 7.05	269	1347	61
2017/18	R 9.36	R 8.63	207	1647	92
Total	R 56.24	R 53.37	1080	8670	94

Source: Daff (2018)

PAFS started disbursing Mafisa loans in KwaZulu-Natal in the 2009/10 financial year. During that year no repayments were made because farmers are provided with an opportunity to harvest before they are expected to make loan repayments. In 2011 the repayment rate was 65% and this improved to 90% in 2012. The reason for the improvement in the repayment rate is that PAFS took cessions on the loans. However, the repayment rate deteriorated to in 2013 and 2014 as a result of drought. Many farmers lost their crops and, as a result, they could not make repayments on their loans. Nevertheless, the repayment rate improved in 2015 followed by a decline in 2016 and 2017. In 2018 the repayment rate improved to 94%.

2.7 Theoretical framework of loan repayment

2.7.1 Theory of rural credit market

The loan repayment of smallholder farmers is based on the theory of the rural credit market.

“Hoff and Stiglitz (1996) explained the rural credit market in terms of three theories. These are the traditional monopoly theory, perfect market theory and the imperfect market theory. The

traditional monopoly theory states that moneylenders found in the informal market charge exorbitant interest rates so that they can maximize their profit because they are monopolists with no competitors. However this theory does not explain why the formal and informal market exist side by side despite the fact that interest rate charged in the formal market is lower than that charged in the informal market.

The perfect market theory states that the rural credit market is perfectly competitive and has a market clearing equilibrium. Furthermore it argues that high interest rates charged by the lender are a reflection of the high risk of borrowers. (Chisasa2014,p100). There is lack of empirical evidence to support this theory due the fact that credit rationing is observed in the market. Credit rationing refers to a situation where a lender denies credit to prospective borrowers due to asymmetric information and moral hazard and not because funds are not available (Robinson, 2001). Asymmetric information occurs when it is difficult or uneconomical for the lender to obtain information about the credit-worthiness of the borrower (Nanayakkara & Stewart, 2015). Moral hazard refers to a situation where borrowers do not attempt to use the loan in a productive manner or use it for some other purpose (Nanayakkara & Stewart, 2015). Stiglitz and Weiss (1981) indicated that identical loan applicants will not all succeed to get a loan even though they may be prepared to pay a high interest rate.

The imperfect market theory states that the informal credit market is associated with the following characteristics: uncertainty, high transaction costs and information asymmetry. These characteristics result in moral hazard and adverse selection. Asymmetric information occurs when it is difficult or uneconomical for the lender to obtain information about the credit-worthiness of the borrower (Nanayakkara & Stewart, 2015). Moral hazard refers to a situation where borrowers do not attempt to use the loan in a productive manner or use it for some other purpose (Nanayakkara & Stewart, 2015). Stiglitz and Weiss (1981) indicated that identical loan applicants will not all succeed to get a loan even though they may be prepared to pay a high interest rate.

Hoff and Stiglitz, (1996) based their theory on the screening, incentive and enforcement problems.

The screening problem arises due to the likelihood that borrowers will default, and lenders incur high cost, to determine the risk of each borrower. The incentive problem is explained as the high cost incurred by the lender to ensure that borrowers take those actions that make repayment likely. The fact that it is difficult to force borrowers to repay the loan is referred to as the enforcement problem. Nawai and Shariff (2010) added the agency problem as “one of the challenges that lenders face in the market”.

In support of Hoff and Stiglitz (1996), Robinson (2001) identified the following key concepts regarding the imperfect information paradigm. The concepts are asymmetric information, adverse selection, moral hazard and credit rationing. In addition, Rao (2003) also identified asymmetric information and transaction costs as contributing factors for the imperfect market. Adverse selection and moral hazard contribute to the increased occurrence of default in a lender's loan portfolio (Robinson, 2001).

2.8 Determinants of loan repayment

Norell (2001) identified the following contributing factors to loan repayment. In the first place, borrowers may want to test the lender's seriousness about collecting loan repayments. Secondly, there are times when clients experience unforeseen crises such as illness or death in the family. They may feel compelled to provide financial assistance even from borrowed funds. Thirdly, some borrowers may use the loan or part of the loan for personal use with the result that loan repayment will decapitalize the business. Lastly some loans are granted on the basis of favoritism and as a result, a borrower may attempt to delay the payment and default hoping that the loan will be written off.

According to Norrell (2001) the lender may implement the following actions to reduce loan arrears: quick "follow-up of late loans; forming strong solidary groups; update and enforce credit policies; credit officers may focus on a specific geographic area; not lending to new start-up businesses; and, providing incentives to finance officers". If a credit officer visits the client regarding missed payment on the first day after the missed payment the client may receive him warmly and he can warn of bad consequences of defaulting on the loan repayment such as legal action.

Regarding group loans, it is important to visit the home of the chairperson regularly. This is so because in most cases it is the chairperson who misuses the money. The chairperson should be made aware that if there are areas on the loan account the first stop of the loan officer will be the chairperson's home or business. During the formation and training stages group members should understand their roles clearly and also grasp that they are individual signatories for their loans. This allows the credit officer to notice visible signs of development in the neighbourhood arising from the borrower's income (e.g. greater economic activity) or higher attendance at school by children. Conversely, if the credit officers' areas are spread over a big area the multiplier effect of their incomes will be diluted.

The lender may only fund enterprises with at least 12 months experience. Most start-ups usually fail within the first year of operation. As a result, funding a business with more than a year of

operation reduces the risk. The lender may implement an incentive system for loan officers in which they receive bonuses depending on the performance of their loan portfolios.

For those loans that are late (60 days without payment) the lender may group them into the following four categories and design a repayment strategy for each group (Norell, 2001):

- (a) Willing and able to repay.
- (b) Willing but not able to repay.
- (c) Unwilling but able to repay, and
- (e) Unwilling and unable to repay

Table 2: Repayment strategy per borrower type

Groups	Strategy
Willing and able to repay.	The lender can be allowed to make partial payment on the loan.
Willing but not able to repay	The loan can be restructured, and the client should sign a new loan agreement. The partial interest due and the penalty are added on a new loan.
Unwilling but able to repay	Legal action can be perused, or the community can be informed of the lenders unwillingness to repay. Lenders may also be handed over to the debt collector.
Unwilling and unable to repay	Those loans should be referred to debt collectors or be written off as it is not productive to use the lender's staff and time on this group.

Source: Norell (2001)

2.9 Empirical literature review

According to Nanayakkara and Stewart (2015) and Roslan and Karim (2009) the empirical evidence can be divided into three themes which are: borrower characteristics, lender or institutional characteristics, and loan characteristics. Other themes are economic (Isitor, Otunaiya, Adeyonu & Fabiyi, 2016) and natural calamities (Selassie 2008). On the other hand, Isitor et al. (2016) divided the empirical evidence into the following themes: socio economic characteristics, business characteristics and loan characteristics. This approach will be followed in this paper.

2.9.1 Socio economic characteristics

Sharma and Zeller (1997, p.131) analysed repayments of 128 groups in Bangladesh utilizing the Tobit model to determine factors that affected the repayments rate of three groups. The study found that group-based institutions with higher levels of social cohesion have better repayment rates than individual lending.

Similarly, a study done by Nanayakkara and Stewart (2015) analysed data on 1109 records from Indonesia and Sri Lanka using logistic regression and concluded that group lending is less risky than individual lending. Similar results were obtained by Reta (2011), Assefa (2002) and Che (2002).

Brehanu and Fufa (2008) used the two-limit Tobit model to analyse the determinants of loan repayments rate from semi-formal financial institutions among small scale farmers in Ethiopia. The results showed that small group lending had a significant and positive relationship with the repayment rate.

This is because the functions of screening, monitoring and enforcement are transferred to group members (Hoff and Stiglitz, 1990) in-group lending whereas the lender has to perform all these functions in individual lending. Peer pressure also leads to fewer moral hazards which results in improved repayments.

On the other hand, Godquin (2004) investigated group repayments in Bangladesh and discovered that social ties among the group (proxied by the age of the group) had a significant negative impact on the repayment rate. This is in contrast to research done by Sharma and Zeller (1997) and Nanayakkara and Stewart (2015). The explanation for this different finding is that perhaps the power of social penalties decreases as the time of social ties increases as members of the group get to know each other better.

Isitor et al. (2016) investigated factors that are crucial in improving smallholder cooperative farmers' loan repayment in Remo Division of Ogun state, Nigeria using the probit regression analysis. The results indicated that age, level of education and farming experience, were the major factors that increase the likelihood of loan repayment. The number of family members was inversely related to the probability of repayment.

Similarly, Oladeebo and Oladeebo (2008) examined socio-economic factors that influence loan repayment among small scale farmers in Ogbomoso Agricultural Zone of Oyo state, Nigeria. The study showed that the level of education is one of the major factors that positively and significantly influenced loan repayment. On the other hand, the age of the farmer influenced loan repayments negatively.

Mokhtar (2011) used logistic regression to determine factors that affect loan repayment in Tekum and Yum, Malaysia. The study found that older borrowers in the age group 46 to 55 years in Tekum had significant loan repayment problems. However, in Yum younger borrowers in the age group 18 to 25 had significant loan repayment problems.

Roslan and Karim (2009) investigated the determinants of loan repayment among microcredit borrowers of Agrobank in Malaysia. They used the probit and logit models to identify the main

determinants that influence the probability of loan repayment. The results of the study showed that the gender of the borrower influenced the probability of loan repayment. Other studies that support this are Oladele and Ward (2016) and Nam and Duy (2016)

Wamalwa (2016) conducted a study with the objective of identifying the determinants of loan repayment by borrowers in microfinance institutions in Nakuru county, Kenya. The study used the linear multi-regression model and the results showed that education level, income level and age have a negative impact on loan repayment. Negera (2014) assessed the socio-economic and demographic factors that influence loan repayment. The results indicated that non-farm income had a positive and significant effect on loan repayment performance. On the other hand, family size and celebration of social ceremonies had a negative impact on loan repayment.

Kiliswa and Bayat (2014) identified the major determinants of loan repayment in small-scale enterprises in Kariobangi Division Nairobi, Kenya. They found that personal characteristics such as education level, family size, and business experience of respondents have a positive relationship to loan repayment. Furthermore, they also found out that age and gender had an inverse relationship to loan repayment.

Reta (2011) analysed and identified the factors that influence the loan repayment performance of the beneficiaries of ADCSI. They found that age was a factor that influenced loan repayments. Gender was found to be a significant determinant of loan repayment.

Bhatt and Tang (2002) analysed the determinants of loan repayments for four microcredit programmes in the US. The results showed that higher levels of education increases the borrower's chance of loan repayment. Selassie, (2008) identified the major socio-economic factors that affect the loan repayment capacity of members of multipurpose cooperatives of Kiltawulalo in Ethiopia. The study found that education status, experience in credit utilization, off-farm and non-farm activity of the household, were positively related to loan repayment.

Oladele and Ward (2016) examined the determinants of loan repayment patterns for Micro Agricultural Financial Institution of South Africa in the Northwest province. Significant determinants of no repayment were natural capital, gender, marital status and membership of organisations. Significant determinants of repayment were human capital, marital status, dependents and gender.

Mashatola and Darroch (2003) investigated factors that affect loan repayment on a mortgage loan scheme in KwaZulu-Natal, South Africa using a logit model. The results showed that farmers with higher levels of average annual farm gross turnover relative to loan size and those with access to off-farm income had a high repayment rate.

Kuhn and Darroch (1999) did a study on the rural medium-term loan performance in KwaZulu-Natal, South Africa and found that first time borrowers and clients with modest loans and small owner direct equity tended to default on loan repayments.

Baklouti (2013) used the logistic regression to identify the determinants of microcredit loan repayments for the Tunisian Microfinance Bank. The results highlighted that educational level, borrower's age, marital status and gender have a noticeable effect on the repayment strategy. Njoku and Odii (1991) analysed the loan repayment performance of smallholder farmers in Nigeria. The study found that a positive relationship between farming and years of farming experience and loan repayment. Loan repayment also improved with the size of the farm.

Nwachuku (2013) undertook a study to identify the major characteristics of borrowers who fail to honour their repayment commitments as opposed to those who partially repaid their loans. The study found that older borrowers were more likely to have repayment problems. The frequency visits by extension officers reduced the chances of default.

Nam and Duy (2016) found that repayment in-group schemes was positively affected by educational level, and negatively by the loan amount and repayment by independent borrowers is positively affected by the loan amount, farmers as borrowers and gender of borrowers. add background

Haile (2015) found that the probability of loan default increased as the family size increase, when the borrowers has a negative perception on repayment period, less training, low business experience, poor saving habit and only has a single source of income. Isitor et al (2016) and Nam and Duy (2016) found a positive relationship between loan repayment and age of the borrower. However, Oladeebo and Oladeebo (2008), Wamalwa (2016) and Kiliswa and Bayat (2014) reported a negative relationship between loan repayment and age.

In their studies Isitor, Otunaiya and Fabiyi (2016) and Nam and Duy (2016), Oladeebo and Oladeebo (2008), Kiliswa and Bayat (2014) and Selasie, (2008) found a positive relationship between loan repayment and education. On the other hand, Wamalwa (2016) reported a negative relationship between loan repayment and education.

Another study with different results is on family size. Negera (2014) found a positive relationship between loan repayment and family size. On the contrary, Kiliswa and Bayat (2014) and Selasie (2008) reported a negative relationship between loan repayment and family size.

2.9.2. Lender characteristics or institutional factors

According to Nanayakkara and Stewart (2015)

“this covers time to approve and disburse the loan amount approved compared to amount applied, period for which the loan is approved compared to the period

applied, visiting frequency by the loan officers, whether training is provided to the borrowers and whether consultancy services are provided to the borrowers.”

Roslan and Karim (2009) investigated the determinants of loan repayment among microcredit borrowers of Agrobank in Malaysia. They used the probit and logit models to identify the main determinants that influence the probability of loan repayment. The results of the study showed that training and advice by the same organisation positively influence the probability of loan repayment. Nanayakkara and Stewart (2015) found that rising frequency of the loan officer were found to be significant when predicting loan repayment in Sri Lanka.

Onyeagocha, Chidebula, et al (2012) analysed the loan repayment performance of microfinance institutions in the South-East state of Nigeria. Outreach, training duration and credit officers' experience were found to be determinants of loan repayment performance.

Negera (2014) assessed the institutional factors that affect rural loan repayment performance of smallholder farmers. The results indicated that extension contact had a positive impact on loan repayment. On the other hand, distance from the main road had a significant effect on loan repayment. Oladele and Ward (2016) examined the determinants of loan repayment patterns for Micro Agricultural Financial Institution of South Africa in the Northwest province and discovered that the frequency of extension contact has a positive influence on loan repayment.

Nwachuku (2013) undertook a study to identify the major characteristics of borrowers who fail to honour their repayment commitments as opposed to those who partially repaid their loans. The frequency visits by extension officers reduced the chances of default. Batt and Tang (2002) analysed the determinants of loan repayments for four microcredit programmes in the US. The results showed that higher levels of education increases the borrower's chance of loan repayment. Haile (2015) found that the probability of loan default increased when the borrower has a negative perception on the loan repayment period and has less training.

Nanayakkara (2015) did a study on loan repayments using logit and found that the loan cycle was significant to predict loan repayment. This is because those who have a good repayment record on their first loans get bigger loans in their next loan applications.

Selassie (2008) used the logit model to determine factors that influence loan repayment. The findings were that the amount of the loan had a positive significant influence on loan repayment. The reason for this is that as the loan amount increases, it enables the borrower to generate more farm income as it creates access for the household to use the required amount of inputs.

2.9.3. *Loan characteristics*

Roslan and Karim (2009) investigated the determinants of loan repayment among microcredit borrowers of Agrobank in Malaysia. They used the probit and logit models to identify the main

determinants that influence the probability of loan repayment. The results of the study showed that the amount of the loan and repayment period influence the probability of loan repayment. Oladeebo and Oladeebo (2008) examined loan factors that influence loan repayment among small-scale farmers in Ogbomoso Agricultural Zone of Oyo state, Nigeria. The study showed that the amount of loan obtained by farmers was a major factor that positively and significantly influenced loan repayment.

Baklouiti (2013) used the logistic regression to identify the determinants of microcredit loan repayments for the Tunisian Microfinance Bank. The results highlighted that the credit amount has a noticeable effect on the repayment strategy. Kiliswa and Bayat (2014) investigated the major determinants of loan repayment in small-scale enterprises in Kariobangi Division, Nairobi, Kenya. They found that the amount of loan applied has a positive relationship to loan repayment. Furthermore, they also found out that the interest rate had an inverse relationship to loan repayment.

Onyeagocha, Chidebula, et al (2012) analysed loan factors that affect repayment rate of microfinance institutions in the South-East states of Nigeria. Loan size was found to be a determinant of loan repayment performance. Selassie, (2008) identified the loan factors that affect loan repayment of capacity of members of multipurpose cooperatives of Kiltawulalo in Ethiopia. The study found that the appropriateness of the repayment period was significant at less than 5 percent. Nanayakkara and Stewart (2015) analysed data relating to 1109 loan records from Indonesia and Sri Lanka and developed models to predict the repayment probability of micro financing loans using logistics regression. The study the found that time to approve and disburse the loan, loan cycle and the purpose of the loan and rising frequency of the loan officer were found to be significant when predicting loan repayment in Sri Lanka. In Indonesia three factors were significant. The factors are time to approve and disburse the loan and the interest payment frequency.

Mokhtar (2011) in a study performed in Malaysia, found that farmers who paid weekly loan repayments in Tekum and Yum borrowers who paid more than Rm201 a week loan repayment encountered problems in repaying their loans. Godquin (2004) examined the microfinance repayment performance in Bangladesh and found that the size of the loan had a negative impact on loan repayment. Nam and Duy (2016) found that repayment in-group schemes was negatively affected by the loan amount and repayment by independent borrowers is positively affected by the loan amount.

2.10 Chapter Summary

This chapter opened with tracing the history of microfinance from its beginning until the current period. It also covered microfinance models, characteristics of microfinance and an overview of

farming and Mafisa in Kwazulu-Natal. After that it covered the theoretical framework of loan repayment, causes of loan non-repayment and strategies for addressing different types of borrowers.

According to Hoff and Stiglitz (1996),

“loan repayment is based on the theory of the rural credit market which states that the informal credit market is characterised by uncertainty, high transaction costs and information asymmetry that leads to moral hazard and adverse selection. As a result of the lender is faced with the problems of screening, incentive and enforcement.”

The empirical literature review was organised into socio-economic, lender and loan characteristics. The studies identified different findings between loan repayment, age and education. On the other hand, there were similar findings on loan repayment and lender and loan characteristics. Clarification is needed.

This study is aimed at determining socio-economic and loan factors that influence loan repayment of Mafisa-funded farmers in uMkhanyakude district municipality. The factors that will be investigated are age, level of education, gender, loan cycle and the number of hectares. There is no similar research that has been undertaken for the identified district municipality and, as a result, it will be useful to determine if the results found in other countries apply to this district as well.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter covers the research methodology and data. Section 3.2 and 3.3 will cover the sample size including data and the analytical framework respectively. The analytical framework discusses the description and specification of the regression equation as well as the definition and measurement of variables in the regression model. Section 3.4 discusses the estimation technique.

3.2 Data and sample size

The unit of analysis is Mafisa-funded farmers in Ilembe and Umkhanyekude district municipalities. The study uses secondary data obtained from a Mafisa intermediary (Peulwana Agricultural Financial Services). The data collected include the following variables on smallholder farmers: age, gender, level of education and loan status. This data will be supplemented with data available from the Department of Agriculture, Forestry and Fisheries, which will provide the age of the farmer and the number of hectares of each farmer. The data covers the period 2010 to 2017 on Mafisa-funded farmers in uMkanyakude, KwaZulu-Natal.

The first step in the determining of an appropriate sample included the definition of research population. This study population was identified as “all beneficiaries (farmers) of Mafisa loan schemes throughout the nine provinces of South Africa who are currently in the Mafisa loan book”. Due to the time and budget constraints, a sampling technique was used to represent the population. A stratified random sampling framework was therefore chosen. Using this technique, farmers were grouped into distinct strata by provinces and districts. One province (KwaZulu-Natal) was then selected, within which one district was randomly chosen (uMkanyakude district). The total number of farmers who are beneficiaries to the loan schemes in this district were identified using Mafisa internal records. The sample size was hence determined using Raosoft online sample calculator backed up by Israel (1992)’s formulas and proposals for sample size determination. Figure 3.1 is a screenshot of the online sample calculator which suggests a sample of 169 while Israel (1992: 3) suggests a sample of 172 at the 5% significance level. The selected sample size was hence the higher of the two (172 farmers) equally represented in the two districts.

3.3 Analytical framework

Quantitative research analysis techniques were used in this study. Descriptive statistics (mean, mode, median and standard deviation) were useful in the comparisons of central tendency and dispersion in the datasets for example the modal age group. The main form of statistical inferencing was logistic regression modelling following similar applications by Roslan and Karim

(2009) and Mokhtar (2011). Logistic regression was used in the determination of the strength of impact each factor has on the level of repayment of loans in the selected districts of KwaZulu-Natal province.

3.3.1 Regression equation and estimation techniques

Based on the framework above, the study employs the multiple regression model to examine the effect of borrower characteristics developed such that:

$$y = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \varepsilon$$

Where

y = The loan repayment status

X_1 = Age of borrower

X_2 = Gender of borrower

X_3 = Level of education of borrower

X_4 = Borrower’s loan cycle

X_5 = Size of land of borrower

α = The constant

ε = The error term

$\beta_1-\beta_5$ = The coefficients/strength of impact of factor X_1-X_5

3.3.1 Estimation techniques

Given a loan repayment model equation 3.2 below provided by Mokhtar (2011:57): Loan repayment status = f (socio economic factors, business factors, loan factors (3.2)

$$P_i = E(Y_i = 1|X_{ij}) = \frac{1}{1+e^{-z_i}} = \frac{1}{1+e^{-(\alpha+\sum_j \beta_j X_{ij} + \varepsilon_i)}} \dots \dots \dots (3.3)$$

Where Y_i becomes 1 if the borrower is failing to repay the loan or 0 if the borrower is/has successfully serviced the loan and

P_i measures the probability of loan default. This means the higher its value, the more likely it is that the advanced loan will default (Mokhtar, 2011:58).

Summarising the regression equation produces:

$$Z_i = \alpha + \sum_j \beta_j X_{ij} + \varepsilon_i$$

Z_i = The probability of loan repayment

α and β_j = The constant and parameter respectively

X_{ij} = The factors influencing loan repayment and

ε_i = The error term of the equation

Using equation 3.3 (the cumulative logistic distribution function), we can deduce the probability of a borrower having no repayment problem as $(1 - P_i)$ such that:

$$(1 - P_i) = \frac{1}{1 + e^{Z_i}} \dots\dots\dots (3.4)$$

This means the chances of not having a repayment problem can be expressed as:

$$\frac{P_i}{1 + P_i} = \frac{1 + e^{Z_i}}{1 + e^{-Z_i}} = e^{Z_i} \dots\dots\dots (3.5)$$

This can be further expressed by taking natural logarithms to produce:

$$Z_i = \ln\left(\frac{P_i}{1 + P_i}\right) = \alpha + \sum_j \beta_j X_{ij} + \varepsilon_i \dots\dots\dots (3.6)$$

In this equation, Z_i represents the odds ratio of a borrower having a repayment problem.

While quoting Maddala (1983), Mokhtar (2011:59) noted that the model presented above is a binary choice model which makes the use of ordinary least squares estimation none appropriate. A maximum likelihood technique is hence adopted in the logistic regression equation to obtain the best estimates. This function is given in equation 3.7.

$$L = \prod_{Y_i=1} P_i \prod_{Y_i=0} (1 - P_i)$$

Using a deduction by Greene (1997) the function above can be used to deduce the probability of having a repayment problem as follows:

$$P_i = (Y_i = 1 | X_{ij}) = \frac{e^{Z_i}}{1 + e^{Z_i}}$$

3.4 Definition of variables

In this model, the two variables were separated into independent and dependent. The dependent variable was noted as “loan repayment status (whether the loan has been repaid or not at the time of the study. This was coded as dichotomous with ‘0’ representing a repaid loan and ‘1’ representing an unpaid one)” while independent variables were the factors under investigation. Based on literature review, the following factors were identified as independent variables:

3.4.1 Age of the farmer

This variable is a continuous variable which is will be measured in years. The hypothesis for this variable is that it should be positively related to the farmer’s loan repayment. This is because of the fact that as the farmer gets older, he gets experience and knowledge in the use of credit which might help to accumulate wealth over time. This can enable the borrower to repay the debt in a shorter time than young borrowers could. Isitor, Otunaiya and Fabiyi (2016) and Nam and Duy (2016) found a positive relationship between loan repayment and age of the borrower. However, Oladeebo and Oladeebo (2008), Wamalwa (2016) and Kiliswa and Bayat (2014) reported a negative relationship between loan repayment and age.

3.4.2 Gender of the farmer

This is a dummy variable and the farmers were categorised as either male or female. The hypothesis for this variable is that being a females is positively related to the farmer’s loan repayment. According to Roslan and Karim (2009) “lending to women can lead to their economic empowerment and inculcate in them a culture of hard work and financial discipline which can lead to high loan repayment rates.” This view is also supported by Nanayakkara & Stewart (2015) who argued that “there is strong evidence in the literature that repayments by female borrowers are better than those by males in micro finance lending.”

Roslan and Karim (2009) and Sharma and Zeller (1997) found that the gender of the borrower influenced the probability of loan repayment. Other studies that support this are Oildale and Ward, (2016) and Nam and Duy (2016). On the other hand, Reta (2011) found that women have better repayment records only when they were members of a group. Tang (2002) found that women were worse in loan repayment than men. Finally, Godquin (2004) found that gender did not influence loan repayment.

3.4.3. Educational level of the farmer

This is a dummy variable and farmers were grouped according to whether they had matric or obtained post-matric qualification. Babatunde, Omotesho, and Sholotan (2007) and Hundie and Belay (2005) argued that education will have the impact of reducing default. The hypothesis is that the education level of the farmer has a positive relationship with loan repayment because of the following reasons (Selassie, 2008). Firstly, education improves the farmer’s ability to obtain,

process and use information. Farmers with more education may seek information on prices more than the those with less education and, as a result, may get better prices which will result in more income. Secondly, educated farmers are expected to have more exposure to the external environment and accumulated knowledge through formal training, which may lead to better decision making

3.4.4. *Loan amount*

This variable is a continuous variable which will be measured in Rands. The hypothesis for this variable is that it should be positively related to the farmer's loan repayment. According to Selassie (2008) it is believed that when the loan amount is enough to fulfil the demand of the farmer, farmers will be in a position where they can apply the recommended rate of farm input. The expectation is that farmers who receive the amount that they demand will be able to produce enough products which will enable them to produce more products, which in turn, will also increase their sales. This will therefore increase their income, which will lead them to repay their loan on time. This variable is expected to have a positive effect on loan repayment.

3.4.5. *Loan cycle*

This variable is a continuous variable and refers to the number of times that the borrower applies for a loan from the lender (Nanayakkara & Stewart, 2015). The hypothesis for this variable is that it should be positively related to the farmer's loan repayment. Limsombunchai et al (2005) argued that the relationship of a bank with the client increases with the loan cycle and this leads to reducing information asymmetry problems and results in improved repayment of loans. On the other hand, Paxton et al (2000) found that the loan cycle had a negative effect on group loan repayment. This is because loan officers and borrowers may take it easy when they get to know each other and become less cautious which may result in low repayment.

3.4.6. *Size of the land.*

This is a continuous variable which is measured in hectares (ha). The hypothesis for this variable is that it should be positively related to the farmer's loan repayment. It is expected that a farmer with more hectares of land will repay the loan better than the farmer with fewer hectares. This is because a large farm size will yield a higher production and a higher income and thus enable the farmer to repay the loan (Selassie: 2008)

Table 3: summary of definition of variables and measurements.

Variable	Measurement	Scale
Loan repayment status	1- default, 0-not in default	Nominal
Gender	1-Female, 0-Male	Nominal
Age	Age of the borrowers in years.	Ratio
Educational level	1- up to matric, 0-beyond matric	Nominal
Loan amount	Amount of loan	Ratio
Loan cycle	Number of loans previously granted.	Ratio
Size of land	Number of hectares	Ratio

3.5. The research process

This study involves an investigation of six factors that influence the repayment behaviour using a sample of 191 of MAFISA funded farmers in uMkanyakude, KwaZulu-Natal province, South Africa. To achieve the research objectives, raw data will be obtained from Peulwana Agricultural Financial Services. This data will cover age, gender, level of education, amount borrowed, loan cycle, size of land and repayment status (as at the time of the data collection exercise). Secondary data is preferred because it will reduce costs and time of conducting the research.

Raw data was obtained in the form of a Microsoft excel spreadsheet which had to be exported to SPSS version 25 software for analysis. In SPSS, data was cleaned by removing outliers, missing values and any rudimentary capturing errors identified. This study sought to use not only one single statistical inferencing technique, but two techniques whose results would be triangulated. Hence, chi-square analysis was conducted on each of the variables to determine individual impact on repayment behaviour of borrowers. All results from chi-square test were presented, analysed and interpreted in relation to previous empirical findings. The main analytical tool was the multiple logistic regression model in which all variables were put together simultaneously to determine individual and joint impacts using the equation presented under section 3.3.1. The logistic regression model included the calculation of beta coefficients for each variable, the odds ratio and the assumptions testing.

3.6 Chapter summary

This chapter presented an outline of the research methods employed in this study, together with the population characteristics and sampling methods used. Following previous literature relating to the assessment of factors influencing loan default, this study employed a quantitative research approach in which a multiple logistic regression model was constructed. The model used 1 dependent variable (loan repayment status) and 7 independent variables (see Table 3) to determine how factors independently affect the loan repayment behaviour of small-scale farmers in the Ilembe and Umkhanyekude districts in KwaZulu-Natal.

CHAPTER 4

DISCUSSION OF FINDINGS

4.1 Introduction

This chapter presents the research findings. Firstly, descriptive statistics on the sample will be presented. This will be followed by the chi square test and the validity analysis. Lastly the logit regression analysis will be discussed.

4.2 Descriptive statistics

Table 4 shows how borrowers differ in their characteristics as seen by differences in age, gender, educational level, amount borrowed, loan cycle and hectares. The age of the borrowers ranges between 32 and 89 years with a standard deviation of 12 years. On the other hand, borrowers have land sizes that range from two to 497 hectares, with a standard deviation of 91 hectares. The loan amount ranges from R10 000 to a maximum of R1 731 694. The loan cycle ranges from a minimum of one and a maximum of eight cycles. The land size ranges from two ha to a maximum of 497 ha with a mean of 51 ha and a standard deviation of 91 ha.

Table 4 standard deviation and mean of variables

Variable	Min	Max	Mean	Standard Deviation
Age	32	89	54	12
Loan amount	10 000	1 731 694	371 214	992 517
Loan cycle	1	8	1.72	1.56
Land size	2 ha	497 ha	51 ha	91 ha

Source: Researchers estimate from research data

From table 5 the following age groups make up the majority of the farmers in Umkanyakude: 30 – 39 (29%), 40 – 49 (29%), 50 – 59 (27%). These age groups make up 77% of the farmers in the area (77%). The 60 – 89 age groups make up only 23 % of the farmers. Most of the farmers in the area are relatively young.

On gender, 66% of the farmers are male and 34% are female, which shows that the majority of farmers in the area are male. Regarding education, 45% do not have matric, 39.3 % have matric and 15.7% have done tertiary studies. This shows that only a few farmers have done tertiary studies in the area. The majority of the farmers do not have matric (45%) followed by those who have matric (39%). Repayment status indicates that 55% are not in default, however, 45% of the

farmers are in default. The majority of the farmers farm sugar cane (90.6%) followed by vegetables (5.2%), grains (2.6%) and poultry (1.6%).

Table 5 Demographic characteristics of the farmers

Variable	No of participants	Percentage
Age		
30-39 years	55	29%
40-49 years	40	21%
50-59 years	46	15%
60-69 years	29	27%
70 and above	15	8%
Gender		
Male	126	66%
Female	65	34%
Education level		
Up to matric	86	75.9%
Beyond matric	75	24.1%
Repayment status		
Not in default	105	55%
In default	86	45%
Sector of farming		
Vegetables	10	5.2%
Grains	5	2.6%
Poultry	3	1.6%
Sugar cane	173	90.6%

Source: Researchers estimate from research data

4.3 Demographics and Default Status

The section tests relationships between farmer characteristics and default status. The analysis below shows how each individual predictor contributes to the dependent variable using a chi-square test of independence. The chi square was performed at the 5% significant level.

4.3.1 Age and default status

Results seem to suggest that younger borrowers have on average a lower repayment rate. The p value (0.241) indicates that there is no significant difference in the default status of farmers across different age groupings.

Table 6: age and Default status

Age group	Percentage of defaulters	Percentage not defaulted	p value
30-39 years	61.5%	38.5%	0.241; 5d.f.
40-49 years	57%	43%	
50-59 years	61%	39%	
60-69 years	61%	39%	
70-79 years	57%	43%	
80-89 years	0%	100%	

Source: Researchers estimate from research data

4.3.3 Gender and default status

Table 7 shows that 54.8% of males are in default and 45.2% are not in default. On the other hand, 55.4% of females are in default and 44.6% are not in default. The differences shown by a p value of 0.935 are insignificant between males and females. This suggests there is no significant difference in the default status of both men and women.

Table 7: gender and default status

Gender	Percentage of defaulters	Percentage not defaulted	P value
Males	54.8%	45.2%	0.935; 1d.f.
Females	55.4%	44.6%	

Source: Researchers estimate from research data

4.4.4 Educational level and default status

Table 8 shows that 46.5% of the farmers who do not have matric defaulted while 53.5% did not default. For those with matric, 64% defaulted and 36% did not default. Of those with tertiary studies, 67% defaulted and 33% did not default. The p-value of 0.086 indicates that educational level is not significant in influencing loan repayment. Using absolute figures seems to suggest that farmers who are educated beyond matric are more likely to default on their loans than those who are educated up to matric. Chi square results however fail to reject the null hypothesis with 95% confidence; and suggest that there are statistically insignificant differences in repayment behaviours among different educational levels.

Table 8: Educational level and default status

Educational level	Percentage of defaulters	Percentage not defaulted	P value
Up to matric	46.5%	53.5%	0.105; 2d.f.
Beyond Matric	64%	36%	

Source: Researchers estimate from research data

4.4.5 Loan Cycle and default status

Empirical studies have suggested that repayment behaviour is often influenced by the length of time a borrower has been in the system (borrowers' experience). On one hand, it is possible that a farmer borrowing for the second or third time would have become more knowledgeable about the system and consequences of defaulting such that he/she is likely to repay without default. On the other hand, first time borrowers may seek to build favourable credit records by having excellent repayment records on their first loans and then begin to default later on.

Table 9 indicates that 44% of first-time borrowers defaulted and 56% did not default. For those farmers with a second and above cycles 85% defaulted and 15% did not default. Based on the p value (0.001), we can therefore reject the null hypothesis and conclude that the borrower's loan cycle has implications for their likelihood to default.

Table 9: loan cycle and Default status

Loan cycle	Percentage of defaulters	Percentage not defaulted	P value
First time	44%	56%	

Second & above times	85%	15%	0.001; 1d.f.
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Source: Researchers estimate from research data

4.4.6 *Loan amount and default status*

Loan amount is significant in influencing loan repayment. As the loan amount increases the repayment rate decreases. (see table 10). The p value of 0.002 shows that loan amount is significant in influencing loan repayment.

Table 10: Loan amount and Default status

Loan amount	Percentage of defaulters	Percentage not defaulted	P value
R10 001 – 40 000	45.5%	54.5%	0.002; 3d.f.
R40 001 – 100 000	42%	58%	
R100 001 – 500 000	72%	28%	
R500 001 & Above	74%	26%	

Source: Researchers estimate from research data

4.4.7 *Land size and default status*

Table 11 indicate that land size has a negative significant influence on loan repayment (p value is 0.001). As the loan size increases the percentage of repayment reduces.

Table 11: land size and default status

Size of land	Percentage of defaulted	Percentage not defaulted	P value
2 – 25 Hectares	40.5%	59.5%	0.001; 2d.f.
26 – 100 Hectares	89%	11%	
Above 100 Hectares	93.5%	6.5%	

Source: Researchers estimate from research data

4.4 **Regression Results**

The estimated coefficients and odds ratio for the explanatory factors for loan default are presented in Table 12. Of the six variables tested on their influence on loan repayment performance of smallholder farmers in umKanyakude district three were found to be statistically significant. Overall, the model was successful in predicting factors that contributed to 71.5% of the microcredit loan repayment problem. In addition, the Nagelkerke R squared of 0,499 indicates

that the model has predictive power. Finally, the Hosmer–Lemeshow test of 0,847 shows a good fit.

The coefficient of age is positive, which consistent with the studies by Isitor et al (2016) and Nam and Duy (2016). However, it failed the test of significance and consistent with the findings of Haile (2015) and Godquin (2004) who found that age was not significant in influencing loan repayment.

Table 12: Logit estimates for factors influencing loan repayment behaviour

Independent variable	Estimated beta coefficient	Odds ratio
Age	0.018	1.019
Gender	0.193	0.602
Size of land	-0.013	0.987**
Loan cycle	-0.518	0.596*
Educational level	0.264	1.303
Loan amount	1.243	3.467*
Constant	-1.584**	
Nagelkerke R Squared	0.499	
Hosmer & Lemeshow test	0.847	
Lo likelihood	168.124	
Degrees of freedom		
Total observations	191	
Prediction accuracy (%)	71.5%	

Notes: ** beta coefficients and odds are significant at the 1% level; * beta coefficients and odds are significant at the 5% level; Source: Researchers estimate from research data

The coefficient of gender is not significantly related to the likelihood of loan default. This indicates that loan repayment is not gender sensitive. This is in line with Batt and Tang (2002) who also found that gender is not significant in influencing loan repayment. However, due to the general skewness of results with 66% of participant farmers being male, it is possible that with a more gender balanced sample, results could show significant differences.

The size of farmland is observed to be negative and significantly related to the likelihood of loan default. This indicates that large farmland decreases the likelihood of loan default. The estimated odds ratio of 0.987 indicates that the association of size of farmland and loan default is not very strong. A farmer with more hectares of land is expected to be better off with loan repayment because a bigger farm may provide higher production which will enable the farmer to repay the loan (Selassie) 2008. This is in line with Selassie (2008) and Baklouti (2013) who find land size has a positive significant impact on loan repayment. However, this may not always be true in all circumstances since greater land size without farm efficiency may lead to even less output than smaller, easy to manage farms.

The loan cycle is negative and significantly related to the likelihood of loan default. This indicates that a large loan cycle decreases the likelihood of loan default. The estimated odds ratio of 0.596 indicates that the association of loan size and loan default is not very strong. A farmer with a higher loan cycle is expected to be better at loan repayment. This finding is in support of Kuhn and Darroch (1999) Nanayakkara and Steward (2015) and Onyeagocha and Chidebula (2012) who find a significant positive relationship between loan repayment and loan cycle. Limsombuchai et al (2005) in Nanayakkara (2015) argued that the relationship of a bank with the client improves with the loan cycle and this reduces information asymmetry problem leading to improved repayment.

Education is not significant in influencing loan repayment. These results do not support studies done by Isitor et al (2016), Oladeebo and Oladeebo (2008), Wamalwa (2016), Kiliswa and Bayat (2014) and Bat and Tang (2002). Such differences may relate to the skewed nature of the sample in this study where 76% were educated up to matric and 24% are educated beyond matric. Skewed samples may distort results due to the limited number of observations on one side. However, the findings are supported by Mokhtar (2011) who also found that education is not significant in influencing loan repayment. Rather, farmers' passion and experience in farming influence their productivity and overall ability to repay. Despite the disagreement of findings between this study and previous studies, results met the requirements of a chi square test and logistic regression since the minimum number of observations in each category were met.

Loan amount is positive and is significantly related to the likelihood of loan default. This indicates that a large loan amount increases the likelihood of loan default. The estimated odds ratio of 3.47 indicates that the association of loan size and loan default is very strong. A farmer with a large loan size is expected to find difficulty in loan repayment. This is not supported by Roslan and Karim (2009), Baklouti (2013) and Mokhtar (2011) who both found a positive significant

relationship between loan amount and loan repayment. The reason for this may be that as the loan size increases the possibility of moral hazard increases and thus the increase in loan default.

4.5. Chapter summary

This chapter concentrated on presenting results collected, analysing them and offering discussions in relation to literature. It begins by presenting the demographic profile of respondents in terms of their gender, age and educational level. This is followed by a discussion of the influence of each of the six factors on repayment behaviour using a chi square test of independence. The main model of the study is finally presented in section 4.4 together with the model-fit and predictive capacity tests. Overall, it was established that three out of six factors namely loan amount, size of land and borrowers' loan cycle affect repayment behaviour while the other three (gender, age and educational level of farmers) were found to insignificantly affect repayment behaviour. Discussion of findings showed that findings of this study are corroborated by some previous studies while there are disagreements with others.

CHAPTER 5

SUMMARY , CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter will cover a summary of the study, policy recommendations and possible areas of future research. Section 5.2 will provide the objective of the study as well as the major findings from the study. Section 5.3 will cover policy recommendations and section 5.4 will conclude with avenues for future research.

5.2 Summary of the study

A review of empirical studies focused mainly on establishing the theoretical framework within which the study is based and reviewing the factors influencing loan repayment behaviour of different borrowers. It was discovered that some empirical studies emphasize qualitative reasons which are hard to measure directly as among the prominent factors affecting repayment. One such a study is Norell (2001) who maintains that repayment is affected by lenders' own willingness to repay; the rising of unforeseen circumstances; diversion of funds from the initial purpose and favouritism/nepotism in loan issue. While difficult to quantify, there is general agreement in literature that such factors exist especially among government funded loan programmes which seek to uplift rural/small scale farmers; such as by Godquin (2004) who corroborates the study by Norell (2001).

Other studies emphasise the impact of quantitative factors on the repayment behaviour by borrowers. Studies such as Nanayakkara and Stewart (2015) and Roslan and Karim (2009) stress the relationship between borrower characteristics (such as age, gender and educational level), loan characteristics (such as the amount, term and interest rate) and institutional characteristics (such as the capacity to monitor and follow up on delinquent loans) as key factors impacting repayment. These studies suggest that the ability of a borrower to repay is not a simple question of one or two factors but is rather an interaction of related personal, loan and institutional factors. Further studies by Brehanu and Fufa (2008) and later by Reta (2011) also underline how the socio-economic environment within which the loan was issued can determine whether a borrowed amount will be repaid or not. Overall, most studies conducted in sub-Saharan Africa are in general conformity when it comes to the factors influencing borrowers' repayment ability. Studies which include Oladeebo and Oladeebo (2008) (Nigeria), Wamalwa (2016) (Kenya) and Oladele and Ward (2016) (South Africa) are all in general conformity.

Mafisa was established in 2005 by the South African government to finance smallholder farmers. The scheme is a revolving fund and if repayments are low it implies that other farmers will not be able to get loans in the future. Low repayments may also lead to the closure of the scheme as funds can dry up. If that happens, government will no longer be able to assist smallholder farmers with credit for production inputs and this will hamper its initiative to create jobs, revitalise rural areas and provide food security. On the other hand, smallholder farmers and intermediaries may lose their source of livelihoods.

The objective of this research was to determine factors that govern loan repayment for Mafisa funded farmers in Umkanyakude district, KZN. Data was collected from 191 selected loans granted by PAFS in Umkanyakude district. The study used secondary data obtained from PAFS. The sample size was determined using Raosoft online sample calculator. Logit model was used to analyse the data and predict the chances of success or failure regarding loan repayments. The study found that age, gender and education were not significant in determining loan repayment. These findings are corroborated by studies such as Isitor et al. (2016), Oladeebo and Oladeebo (2008), Wamalwa (2016) and Kiliswa and Bayat (2014). The findings however disagree with Bat and Tang (2002). On the other hand, land size, loan amount and loan cycle were significant in influencing loan repayment with a prediction accuracy of 71.5%. The significant factors all conform with previous findings such as Darroch (1999) Nanayakkara and Steward (2015) and Onyeagocha and Chidebula (2012). These studies indicate that (i) the larger the loan amount, the higher the chances of default; (ii) the larger the land size which the borrowed amount will be used for, the higher the chances of repayment and (iii) the more frequent a farmer borrows (more and more loan cycles), the more likely he/she is to repay the loan. Lastly, an analysis of the Nagelkerke R Squared and Hosmer & Lemeshow test showed that the model was sound and had high predictive power.

5.3 Policy recommendations

The results of the empirical analysis have three main policy implications for the government and the microfinance institutions. Firstly, government should assist smallholder farmers to obtain more hectares of land so that they can plant more crops and increase their sales. This will enable them to improve their repayment rate. This is based on the finding that farmers with large land sizes have better repayment records than those with smaller land sizes.

Secondly, microfinance institutions should initially provide farmers with smaller loan amounts as it leads to good repayment. This will help to improve the scheme's loan book. This recommendation is supported by the finding that farmers with a small loan amount repay their loans better than those farmers with large loan amounts.

Thirdly, microfinance institutions should provide more loans to lenders on a second or more loan cycle as this leads to good repayment. This may lead to an improved loan book and the sustainability of the microfinance institutions. This recommendation is supported by the finding that farmers with a second or more loan cycle have a better repayment record than those farmers with only one loan cycle.

5.4 Avenues for future research

Future research may include other district municipalities and other variables (that were not included in this study due to time and cost constraints). The variables are family size; amount of credit borrowed from other sources; off-farm and non-farm income; natural calamities e.g. drought; access to training; appropriateness of the repayment period; frequency of capital and interest repayments; time to approve and disburse the loan; amount approved compared to amount applied; and, visiting frequency by loan officers. Other factors that may affect loan repayment are availability of transport, distance to the MFI as well as the attitude of the borrower regarding loan repayment.

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Appendix 1

Figure 1: Proposed sample size with a population of 300 farmers

What margin of error can you accept? 5% is a common choice	<input type="text" value="5"/> %
What confidence level do you need? Typical choices are 90%, 95%, or 99%	<input type="text" value="95"/> %
What is the population size? If you don't know, use 20000	<input type="text" value="300"/>
What is the response distribution? Leave this as 50%	<input type="text" value="50"/> %
Your recommended sample size is	169

Source: Raosoft inc [2004]