DIGITAL FINANCIAL SERVICES INSIGHTS AND LOAN REPAYMENT IN MICROFINANCE INSTITUTIONS: A STUDY OF SMALL SCALE DAIRY FARMERS IN NAKURU MUNICIPALITY, KENYA.

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DECLARATION AND APPPROVAL

Declaration

I declare that is my original work and has not been presented in this or any other university for any award.

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Approval

This work has been submitted with our approval as the university supervisors.

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DEDICATION

This work is dedicated to my beloved family the late Dad Victor Barasa and Mum Ruth Barasa for their never ending support.

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ABSTRACT

The challenge of agricultural finance is to securely provide cost-effective financing to rural smallholder farmers with minimum risk of fraud and maximum accountability and transparency. Mobile money payments by farmers can provide the transactional volume economics for creating an ecosystem that can be subsequently leveraged on branchless banking distribution channel for mobile banking credit, savings and micro insurance products. Mobile money is simple, convenient, affordable and disruptively innovative. This study sought to fill the gap in the literature on financial inclusion insights by analysing the contribution of digital financial services among small scale dairy farmers in Nakuru County, Kenya. The study sample comprised of 165 dairy farmers borrowers from Micro Kenya, Focus group participants and key informants who were loan officers in MFIs, where purposive sampling methods was employed. Data was collected through questionnaire, focus groups, and key informant interviews and both qualitative and quantitative methods were used to analyse the data. The study findings made an attempt at predicting current and latent demand for the digital financial products through improve rural livelihoods of small scale dairy farmers by expanding and strengthening social networks; cut down travel costs; increase temporal accessibility; and amplify efficiency of activities. The study findings indicate that mobile phones have significantly changed the way rural businesses are being conducted. In addition to Chama's and banks, friends and family, as well as hiding places, remain common avenues for money storage for the dairy farmers, especially for temporary storage. M-Shwari is the best known value-added digital financial service in the Kenyan market. It is also a well-liked product, with nine in 10 farmers saying they will continue using it and will recommend it to other people with new products like KCB-Mpesa and Equitel yet to take root and be used by the small scale dairy farmers. The bulk of current users say they use digital finance to help them manage short-term ups and down in cash flow as well as to save for short-term goals .It is concluded that digital finance can contribute in improving livelihoods by providing rural households with fast and easy modes of payment, thereby increasing their ability to access livelihood assets, undertake diverse livelihoods strategies, and overcome their vulnerabilities.

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LIST OF ABBREVIATIONS

GOK-Government of Kenya

ICEG-International Centre for Economic Growth

LRR-loan Recovery Rate

M-banking –Mobile banking

MBR-Mobile banking Rate

MDG-Millennium Development Goals

MFIs- Micro Finance Institutions

MSEs- Medium and Small Enterprises

PRSP-Poverty Reduction Strategy Paper

SSDF- Small Scale Dairy Farmers

DFS- Digital financial services

SSMVs-small scale vendors

CHAPTER ONE

INTRODUCTION

1.1. Background

The biggest challenge facing Kenya today is high levels of poverty among its citizens. Poverty has been persistent in Kenya despite government's effort to combat it through national development programs. This is reflected in the rising number of people without access to food, and inadequate access to other necessities Mango et al., (2009). The success of provision of micro credits to poor people previously labelled as unbankable was seen as one way of enabling the low income people to improve their living standards through financial inclusion. Microfinance has been widely hailed as one of the most promising tools for fighting poverty in the developing world UN Department of Public Information, (2005). A common claim is that by allowing poor households to finance basic self-employment activities and/or whether shocks to household production, microfinance loans can act as an important catalyst of economic growth.

These have been paralleled by a significant expansion of this sector in recent years. For instance in 2007, Microfinance Institutions (MFIs) provided 150 million clients across the globe access to small-scale loans through group lending Daley-Harris, (2006).The focus of microfinance on "poor" clients is almost universal, with varying definitions of the word "poor". This issue has been made more important recently due to legislation from the United States Congress that requires USAID to restrict funding to programs that focus on the poor. Some argue that microfinance should focus on the "economically active poor", or those just at or below the poverty level Robinson, (2001). Others, on the other hand, suggest that microfinance institutions should try to reach the indigent Daley-Harris, (2005).

Kenya's current Poverty Reduction Strategy Paper (PRSP) perceives poverty as inadequacy of incomes and deprivation of basic needs and rights, and lack of access to productive assets, as well as social infrastructure and markets. Poverty is largely a rural phenomenon and prevalence of absolute poverty in rural Kenya is 49.1% GOK, (2007). It is noteworthy that two of the Millennium Development Goals (MDG) targets to reduce the proportion of people whose income is less than $1 a day and who suffer from hunger by halve by the year 2015 United Nations, (2006).

The dairy industry in Kenya contributes 14 percent of agricultural GDP and 3.5 percent of total GDP GOK, (2008). Milk production is predominantly by small scale farmers, who own one to three dairy animals, and produce about 80 percent of the milk in the country KDB, (2009). Small-scale dairy production systems range from stall-fed cut-and-carry systems, supplemented with purchased concentrate feed, to free grazing on unimproved natural pasture in the more marginal areas Scholtz and Grobler, (2009). Upgraded dairy breeds tend to be kept in stall-feeding units, crossbred cattle in semi-zero-grazing systems, and zebu cattle in free-grazing systems Techno Serve, (2008).

Kenya's dairy industry is a dynamic and plays an important economic and nutrition role in the lives of many people ranging from farmers to milk hawkers, processors, and consumers. Kenya has one of the largest dairy industries in sub-Saharan Africa. Though the last livestock census was conducted in 1966, the current official cattle population statistics come from the ministry of Livestock and development, through its field reports compiled by extension officers. The official statistics place the number of milking cattle at 3.8 million (Government of Kenya, 2008). A survey conducted by Smallholder Dairy project (SDP) asserts that there are approximately 6.7 million dairy cattle in Kenya (SDP, 2005). The Food Agricultural Organization (FAO) on the other hand estimates a figure of 5.5 million milking animals (Techno serve, 2008).

In Africa, Kenya is the only country, after South Africa that produces enough milk for both domestic consumption and export. Sudan on the other hand is the largest producer of milk in the common market for Eastern and Southern Africa (COMESA), but it does not produce enough to satisfy both domestic and export markets. The dairy industry is the single largest agricultural subsector in Kenya, larger even than tea (Muriuki et al., 2004). It contributes 14 percent of agricultural GDP and 3.5 percent of total GDP (Government of Kenya, 2008). The industry has grown tremendously since its liberalization in 1992. Liberalization led to a rapid growth of the informal milk trade that mainly consists of small scale operators dealing in marketing of raw milk. At that time, there was an emergence of new institutional arrangements in milk collection, 2 processing and marketing, which included hawkers, brokers' self-help groups, neighbours and business establishments like hotels (Karanja, 2003). The informal markets controls an estimated 70 percent of the total milk marketed in Kenya (KDB, 2009; Government of Kenya, 2006). This sector is important and is driven by

among other factors the traditional preferences for fresh raw milk and its relatively lower cost.

Raw milk markets offers both higher prices to producers and lower prices to consumers but with several challenges relating to quality control and standards, and the associated health and safety concerns. The informal milk market has in the past faced several challenges. This was because prior to policy change in 2004, informal vendors, including mobile milk traders and bar vendors, and milk transporters, were not recognized under the old dairy policy. As a result, they were frequently harassed as powerful dairy market players sought to protect their interests and increase market share. There were also concerns over food safety and quality of milk sold by the informal sector players. The dairy policy at the time focused on promoting value addition and increasing the market share of pasteurization milk while attempting to address potential public health risks of consuming raw milk. However, since 2004, there has been a major change in policy and practice towards the informal milk market (Leksmono, et al., 2006).

The dairy policy now clearly acknowledges the role of small scale milk vendors (SSMVs) and contains specific measures to support them. These include: development of low-cost appropriate technologies, training on safe milk handling, provision of incentives for improved milk collection and handling systems, and establishment of supportive certification system. While the Dairy Policy is still in progress, awaiting approval by parliament, there has been a proactive engagement by the Kenya Dairy Board in training and certification of SSMVs, in order to safeguard public health and assure quality of the raw milk (Leksmono, et al., 2006). Nakuru County had many districts. The area has been prone to clashes in the past between the different communities but has now settled down as a productive area with a high potential for dairy farming. The division has a total of 8925 cattle producing 7.5million litres annually (District livestock production annual report 2012). These administrative units: districts and divisions though not currently existent in the current constitution, was used for the purposes of this study.

Branchless banking through mobile phones (M-banking) is probably the most promising innovation in rural finance in the last few years. Using a network of retail agents and the existing mobile phone infrastructure, potentially even distant and sparsely populated areas can be reached with reliable banking services. The first wave of branchless banking efforts

focused on providing payment and money-transfer services. The next challenge is to link mobile money with a full range of banking services CGAP, 2010; Pickens, (2010). Safaricom, the Kenyan mobile network operator behind M-Pesa, allows its 13 million customers to transfer money via their mobile phones and through the countrywide network of more than 23 000 agents (Safaricom, 2010). Today, Safaricom, in partnership with a variety of operators (e.g. banks, non-profit organizations, insurance companies, health-service providers and microfinance.) is piloting innovative m-banking products. M-Kesho (Kesho means "future" in Kiswahili), is a savings account provided by Equity Bank that also gives flexible access to loan and insurance facilities Equity Bank, (2011).

Experience from Kenya, India, Bangladesh showed that small entrepreneurs are prone to default. Sometimes they make wilful default; managerial ability is poor, they do not keep accounts and it is therefore difficult to monitor their operation by the financial institutions Asrat, (1989). Solving the major financial constraint of this important sub-sector of the economy is an important step towards achieving the national development objective of a country. For this to succeed, the problem of high default risk associated with them, which made the financial institutes reluctant to extend loan, has to be solved. Since the late 1970s, development policy has increasingly taken recourse to microfinance to improve the access to financial services for poor households Morduch, (2000). In recent years; however, an increasing number of micro lenders find it hard to maintain high repayment rates.

Product innovation in microfinance is aimed at responding to the variety of poor clients' needs, like to develop and sustain the offer of a range of client-led products. A more market-oriented approach would help the industry both to increase its social impact and to improve long-term institutional sustainability. Indeed, product design can serve as a powerful targeting mechanism for microfinance institutions, because it determines the type of clients attracted and the extent of the benefits clients receives from financial services Woller, 2002; Johnson, 2005; Copestake, (2007). Assessing the needs of a target market segment and designing appropriate products, might help microfinance institution to attain its social mission – for example, avoiding perverse phenomenon known as mission drift (Armendariz and Szafarz, 2010) and guarantee that larger portion of productivity surpluses are attributed to poor clients Labie, (2009); Hudon and Perilleux, (2010). This study focuses on innovative market-oriented products that combine two important features: flexibility and M-banking.

The poor need flexible products that allow transactions adapted to their cash flow. Such products help the poor to smooth consumption, when income is irregular and unpredictable, and to cover unexpected expenditures. Financial products designed for poor clients should also include sanctions or other enforcement mechanisms to mitigate behavioural anomalies, such as lack of self-control, intra-household disagreement, and attention failure. Enforcement mechanisms enhance control over client's budget and assure that payments – savings, loan repayments and insurance contributions – are duly made Collins et al., (2009). Typically, flexibility – for example, in the form of allowance for ex post contract renegotiation – increases the client's temptation to renege on his or her commitment, discouraging financial discipline. Conversely, enforcement mechanisms – for example, social sanctions, or the requirement for the client to provide financial collateral – encourage discipline in the client.

Recent microfinance studies have focused on understanding why rigid enforcement mechanisms in loans contracts are effective. The most discussed mechanism is the regular and frequent repayment schedule ubiquitous in microcredit contracts with repayment starting right after the loan is disbursed Jain and Mansuri, (2003); Field and Pande, (2008); McIntosh, (2008); Field et al., (2011); Fisher and Ghatak, (2010). On the savings side, Ashraf et al., (2003) explore different enforcement mechanisms set in commitment savings contracts in developing countries, and Ashraf et al., (2006) and Karlan et al., (2010) examine their impact on clients' behaviour.

1.2. Statement of the Problem

Dairy farming remains a major concern in rural households especially in Kenya. Most dairy farmers face seasonal income due to agricultural activities; especially dairy farming. However, innovative market-oriented products that combine flexibility features with digital financial services may enhance small scale dairy farmer's repayment by smoothening their income flow to the flexible repayment schedule. However, there is no empirical evidence on the effects of flexible repayment digital financial services in MFIs. Thus, this study seeked to fill the gap in the literature on financial inclusion insights by analysing the contribution of digital financial services among small scale dairy farmers in Nakuru County

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1.3 General objective of the study

To determine the contribution of digital financial services, to loan repayment among small scale dairy farmers.

1.4 Specific objectives

i. To establish how farmers awareness and knowledge on digital financial services affects its usage and repayment
ii. To determine the general financial attitudes and behaviours of small scale dairy who are users of digital financial services
iii. To determine patterns of digital financial services use, particularly in relation to saving ,borrowing and repayment by dairy farmers

1.5 Research questions

i. To what extent knowledge and awareness of digital finance services affect its usage among small scale dairy farmers.
ii. What are the general financial attitudes and behaviours of small scale dairy who are users of digital financial services
iii. Are there patterns of digital financial services use, particularly in relation to saving ,borrowing and repayment by dairy farmers

1.6 Justification of the study

The dairy industry is the single largest agricultural sub-sector in Kenya, larger even than tea Muriuki et al., (2004). Economic growth cannot be attempted without the active involvement, promotion and development of this sector of the economy. One of the most crucial and leading factors is limited access to financial capital and credit especially from the formal lending agents. MFIs have been reluctant to provide loans to Small Scale farmers because; they consider them as involving high risk factor, not dependable and involve excessive administrative costs.

Therefore, an analysis of factors affecting loan repayment performance and effects of flexible repayment schedules on loan default of small-scale dairy farmers would help policy makers to formulate successful credit policies and programs that enable them to allocate scarce financial resources to the development of basic sectors of the economy. Revision of its criteria in favour of credit worthy borrowers could also alleviate the financial constraint of small-scale farmers which are potentially efficient but could not be able to fulfil the MFIs lending requirements.

1.7. Scope and Limitations of the Study

The study focused on small-scale dairy farmers in Nakuru municipality. This study was limited to one product of MFIs that is the dairy loan. Furthermore, the data did not capture information on sales income or amount of profit/loss of projects since they did not have proper financial recording system. However, the results that were obtained taking case of this specific area could reflect the situation of the small-scale dairy farmers all over the country under normal circumstance.

CHAPTER TWO

LITERATURE REVIEW

2.1 Theoretical Literature on loan repayment

There is little empirical evidence on the effects of flexible repayment contracts in microfinance. First evidence on different features of credit contracts indicates possible benefits of flexible repayment schedules. Shoji, (2010) found that allowing borrowers to reschedule their repayments during natural disasters limits the burden on borrowers with strict repayment schedules. With the rescheduling possibility less microfinance, clients are forced to borrow in the informal credit market and more clients are able to maintain their consumption level. Flexibility seems to be an asset in times of income shocks. Most, but not all, microfinance programs focus on women. It has been argued that women repay their loans more often and direct a higher share of enterprise proceeds to their families. Early replicators of the Grameen Bank have spoken of their operations nearly failing until they shifted their lending practices to focus on female clients UNDP, (2008).

Although Kenya's dairy sector has a significant contribution to the national economy, household incomes and food security, the industry faces a number of technical, economic and institutional problems in milk production, processing and marketing Karanja, (2003). These constraints affect the ability of the sector to participate and compete in the domestic and regional markets. Specifically, some of the main constraints to increased milk production in Kenya have been identified as seasonality in production, inadequate quantity and quality of feed, including limited use of manufactured cattle feeds lack of good quality animal husbandry and farming practices, Poor access to credit services and high cost of artificial insemination (AI) service SDP, (2005).

Field and Pande (2008) compared clients who are randomly assigned with a weekly or monthly repayment schedule. They cannot find any significant effect of the type of the repayment schedule on client delinquency or default. In a follow-up study, however, Feigen-berg et al., (2011) found that clients who meet weekly instead of monthly are three and a half times less likely to default on their subsequent loan. They attribute this to increased social

interactions among group members by more frequent meetings which in turn improve informal risk-sharing. Field et al.,(2011) studied the effects of a two months grace period on business and loan repayment performance of micro entrepreneurs. They found that postponing repayment by the grace period increases short-run business investments and long-run profits, but also increases the variance of profits and defaults. The grace period hence implies benefits for the borrowers but at the costs of higher defaults for the financier. Glennon and Nigro, (2005) documents default rates between 13-15% for typical small business loans in the US, which often have a significant grace period between loan disbursement and the start of repayment, these rates are much higher than typical MFI default rates (2-5%).

It has also been noted that micro enterprise development is an effective means of assisting the poor in developing countries Zeller and Sharma, (2000). They have the potential to create employment, especially given that in Africa, the agricultural sector, which is the main sector, has a limited ability to absorb new job seekers Pretes, (2002). There are however, profound cases of coexistence of access to credit and poor welfare, which is a paradox and limited effort have been put to identify the underlying factors. Diagne and Zeller,(2001) established that poor households whose assets consists mostly of land and livestock but who wish to diversify into nonfarm income-generating activities may be constrained by a lack of capital, as both sectors of the market do not grant them access to credit.

2.2 Services of M-banking

Safaricom, the Kenyan mobile network operator behind M-Pesa, allows its 13 million customers to transfer money via their mobile phones and through the countrywide network of more than 23 000 agents Safaricom, (2010). Today, Safaricom, in partnership with a variety of operators (such as Banks, non-profit organizations, insurance companies, health-service providers, among others) is piloting innovative m-banking products. Among those, we selected two innovative services for their relevance to the paper's focus and a third product for its rural application

Branchless banking through mobile phones (M-banking) is probably the most promising innovation in rural finance in the last few years. Using a network of retail agents and the

existing mobile phone M-Kesho is a bank account linked to a client's M-Pesa account. This permits holders to store money (M-Kesho has no maximum savings balance, unlike an M-Pesa account) and to tap into loan and insurance facilities. Only electronic transactions are allowed to and from M-Kesho Safaricom, (2010).Flexibility features include: no fee for opening an account, no minimum balance and no monthly fee (like an M-Pesa account); and fees for withdrawals but not for deposits. To evaluate a client's creditworthiness, Equity Bank uses a credit scoring system based on the balance and transactional history of the customer on their M-Pesa, M-Kesho and normal Equity accounts (if any) over the previous 6 months. M-Kesho was launched in May 2010 and after only 3 months 455 000 people had opened accounts, though activity on these accounts remains low Radcliffe, (2010).

2.3 Trends in Mobile Banking

According to a study by financial consultancy Celent, 35% of online banking households will be using mobile banking by 2012, up from less than 1% today. Upwards of 70% of bank centre call volume is projected to come from mobile phones. Mobile banking will eventually allow users to make payments at the physical point of sale. "Mobile contact less payments" will make up 10% of the contact less market by 2012. Many believe that mobile users have just started to fully utilize the data capabilities in their mobile phones. In Asian countries like India, China, Bangladesh, Indonesia and Philippines, where mobile infrastructure is comparatively better than the fixed-line infrastructure, and in European countries, where mobile phone penetration is very high (at least 80% of consumers use a mobile phone), mobile banking is likely to appeal even more Chogi, (2006).

This opens up huge markets for financial institutions interested in offering value added services. With mobile technology, banks can offer a wide range of services to their customers such as doing funds transfer while travelling, receiving online updates of stock price or even performing stock trading while being stuck in traffic. According to the German mobile operator Mobilcom, mobile banking will be the "killer application" for the next generation of mobile technology Donner, (2005).

2.4 Mobile Transactions

One view is that mobile technology is just another, although highly innovative, access channel; an alternative is that mobile telecommunications networks are becoming the "front office" for financial services leaving the existing banks as providers of back office functions. But there is also another view which seeks to define the competitive advantages of the banking and mobile finance business models and then explore the ways in which these could give rise to new market structures within which the existing portfolio of financial services (savings, credits and transactions) can be unbundled. There are a number of mobile transaction initiatives in the developed and developing world Chogi, (2006). Most are bank-led and largely provide an information and transaction channel which complements existing bank access channels such as branches, telephone banking and online services.

There are, however, significant examples of innovative mobile transaction schemes that hint at a radical transformation of the financial market landscape in that the business model addresses those without existing bank accounts. Examples, which are often cited, include Wizzit in South Africa, Globe in the Philippines and M-PESA in Kenya. In addition, there are mobile financial transaction models which make innovative use of existing widely-diffused financial service platforms, such as Visa, in order to deliver transaction services to under-served market segments. Interestingly, the most innovative of these mobile banking models, and those with the greatest potential to bring significant benefits to consumers, are those addressing the needs of developing markets, which hitherto have been the most complex in which to increase access to finance Donner, (2005).

In both types of approach mobile transactions as a brand new access channel and as an innovative alternative banking system the rapidly-growing mobile communications infrastructure and its associated support services (for example, air time agents) provide the possibility of outreach vastly beyond traditional banking networks and at significantly lower costs. In order to explore the nature of mobile financial transaction systems in more detail, three examples are described below.

Each attempts to provide a system that allows a customer to put cash in and take it out, and make money transfers to other individuals and entities. Each system, however, is „optimized" for particular purposes and thus there are significant practical differences between the systems and the user experience. At their core, each of the schemes described offers four basic services Fafchamps, (2001). Open or closed system – the extent to which a specific

mobile scheme allows transactions and/or payments to any account in any other network. The ability to effectively interconnect with the existing bank clearing systems and money transfer networks (such as Visa), and the terms and conditions of this interconnection regime, is a critical aspect of the design and operation of a mobile banking scheme Haans, (2001).

In effect this interconnection regime defines the nature and extent of the network externalities, and their distribution. Interoperability - the technological design of the system and its functionality. The key issue is whether or not the mobile scheme is essentially a proprietary system embedded in the network, equipment and operations of an existing mobile operator or instead stands free of any particular network. Is the service tied to one mobile network operator or is it network-independent? Mechanisms for deposit making, transfers and cash withdrawal – the effectiveness of these operations is vital in turning a mobile payment system into a transformational mobile system. Without a convenient way to deposit and withdraw cash, any mobile system is bound to fail in mostly cash-based societies. This makes ensuring the trustworthiness of collection agents pivotal in establishing the integrity of the mobile banking product. The integrity and the efficacy of agents in managing the deposit taking process, transfers and cash distribution is critical to managing some of the range of risks inherent in a mobile banking product, including reputational risk (Hughes and Lonie, 2007).

Regulatory compliance – there is a variety of ways to comply with both know your customer (KYC) and anti-money laundering (AML) regulations. For example, AML tools might be applied only when transactions exceed specific limits in terms of both frequency and amount. The migration from mobile customer to mobile bank customer offers significant potential to reduce the costly information asymmetries between customer and bank, as mobile operators of payments schemes hold useful information about customers" usage patterns.   Tariff structures for consumers – are customers charged account fees or fees per transaction? The user experience of the various mobile systems depends on how well specific products correspond to customer needs in different countries Ondieki, (2007).

2.5 Use of mobile money by microfinance

Evidence shows that expanding access among the poor to financial services is effective in reducing poverty. Poor individuals without access to banking services are forced to rely on

the informal cash economy, leaving them vulnerable to risks and lacking means to efficiently save or borrow money. A study in Ethiopia based on household surveys from 1994 to 2000 demonstrated that access to financial services caused a statistically significant reduction in five of seventeen determinants of poverty. A similar multi-country study demonstrated how access to financial services encourages social mobility across generations, thereby leading to poverty reduction in the long run Taylor and Harper, (2001).

Microfinance has proven to be a successful strategy to expand access to financial services in developing countries. In the 1970s, Muhammad Yunus of Grameen Bank pioneered the idea that microfinance small loans to poor, high-risk individuals could enable people to pursue activities that would not only sustain their livelihood but also bring their families out of poverty. Since then, the notion of microfinance has expanded beyond lending. Many MFIs now offer additional services such as savings and insurance. In 2005, the World Bank estimated that less than 5 percent of world demand for microfinance loans was being met. With only 26 percent of the global population connected to formal banking institutions, MFIs, which penetrate rural areas where no conventional banks exist, are in a good position to meet the large demand for credit among the world's poor Varshney and Ron. (2002).

In the last five years, mobile money has proven to be another scalable method to expand the poor's access to financial services in developing countries. According to a recent study by the Consultative Group to Assist the Poor (CGAP), many poor people who do not currently have access to financial services may first gain access to those services through electronic payment tools like mobile money. In South Africa, a CGAP study estimates that 10 percent of current mobile banking customers fall below South Africa's poverty line and did not previously holds a bank account Hughes and Lonie, (2007).

2.6 The importance of flexibility

Product flexibility refers to the ease with which financial transactions are adapted to clients' cash flow Collins et al., (2009). Contrary to the typical enforcement mechanisms used in microcredit products, flexible products allow for grace periods in loan repayment; provide for adaptable instalment schedules to avoid burdening clients with high repayments in difficult times; and allow for loan prepayment, loan renegotiation in the case of an income shock, and loan refreshing at some point during the loan cycle Collins et al., (2009). In the case of

savings services, flexibility corresponds to the absence of a minimum balance requirement, the voluntary nature of savings and, generally, to the possibility of making deposits and withdrawals of variable amounts at any time. Flexibility is important for the poor because it helps them to manage money, e.g. smoothing consumption, coping with emergencies, and taking advantage of business opportunities. For example, ad hoc payment schedules permit households to save cash as soon as it is available, avoiding the temptation to spend it on miscellaneous expenses (Ravi, 2006).

Allowing for a grace period in loan repayment would expand the range of investment opportunities that loans could be used to finance, including projects that require a lengthy gestation period before realizing consistent profits Field et al., (2011). Allowing ex post contract renegotiation, earlier withdrawals in a fixed savings plan or providing for emergency loans, for example, would help poor clients to deal with income shocks or unexpected expenditure needs. Permitting prepayment of loans or offering passbook savings accounts with no restriction on deposits would give the poor a means of investing unexpected small financial surpluses Shoji, (2010).For MFIs, flexibility is good because it would increase clients' satisfaction, reduce client dropout and encourage new clients to take up the products. Moreover, helping the poor manage their money should also reduce problems of delinquency and over-indebtedness Schicks, (2011).

According to the GSMA (Penicaud and Katakam, 2014), the hub organisation for 850+ MNOs worldwide, there are more than 219 mobile money platforms worldwide. Most of these platforms are primarily in developing countries and are confined to the urban city centres. Private-sector players in this space (i.e. mobile network operators, third-party providers, financial institutions) are seeking to expand into rural areas in pursuit of nationwide penetration and new market segments that will actively transact over the mobile channel. This presents a potential alignment between the agricultural and mobile money sectors; smallholder farmers will benefit by having convenience and safety, a 'financial identity' and the ability to participate in an open and transparent formal economic activity.

The roll-out of mobile finance to rural areas inevitably encounters certain barriers such as illiteracy, financial illiteracy, digital illiteracy and lack of trust and limited agent/network coverage. This report has been produced through primary research on agriculture mobile payments initiatives in Ghana, Uganda and Zambia with the aim of understanding the

potential of mobile finance for the agricultural sector and how these barriers might be overcome. The primary and secondary audiences for this report are agricultural stakeholders and mobile financial service providers, respectively.

2.7 The Nature and Role of Credit Market

Bank credit is among the most useful sources of finance for business in Kenya GoK (2005). Bank credit refers to loans and overdrafts extended to enterprises by formal banking institutions. Only 1.5 percent of MSEs receive loans from commercial banks in Kenya International Centre for Economic Growth (1999). It is unclear, how the rest, who form the majority, meet their working and investment needs Kimuyu` and Omiti (2000). Perhaps this is not surprising in light of the magnitude of barriers that they face in accessing credit. Lack of tangible security by MSEs, the limited capacity, outreach and linkages by financial intermediaries and a hostile legal and regulatory framework for financial services are the main constraints GoK, (2005). Yet there is little information as to how the few MSEs that access formal credit manage to do so in light of this very difficult environment. Finance is central to establish and operate productive activity. Sufficient finance is a prerequisite to proper organization of production, acquiring of investment assets and/or raw materials and development of marketing outlets etc. Credit is a device for facilitating transfer of purchasing power from one individual or organization to another. As indicated by Oyatoya (1983) credit provides the basis for increased production efficiency through specialization of functions thus bringing together in a more productive union the skilled labour force with small financial and those who have substantial resources but lack entrepreneurial ability.

The link between credit and economic development has captured the attention of economists since long Schumpeter, (2003). With improved financial intermediation, the proportion of financial savings that is diverted by the financial system into non-productive uses fails, and the rate of capital accumulation increases for a given saving rate Mensah, (1999). He further elaborates the importance of financial intermediation as it enhances saving mobilization by providing a variety of safe financial instruments to savers and ensuring tangible returns on savings. The financial sector contributes to the efficiency of the entire economy by spreading information about expectations and allocation of resources to investors.

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In more explicit analysis of the association between finance and economic development, Schumpeter, (2003) treated the banking system and entrepreneurship as the two key enabling agents of development. Schumpeter argues that the banking system's capacity to supply initiative and entrepreneurship in addition to credit creation enabled it to transfer resources from less productive uses to more economically rewarding uses because those who control existing resource or have claims on current wealth are not necessarily those best suited to use these resources.

The MFIs system credit creation equipped entrepreneurs with purchasing power with which they were able to express overriding command over real productive resources. Financial theorists argue that if economic units relied completely on self-finance, investment will be constrained by the ability and willingness of each unit to save, as well as by its capacity and readiness to invest Mensah, (1999). In his contribution to the role of financial institutions, Piscke, (1991) admitted that even though finance is a catalyst for investment, it is also a catalyst for poor investment, political patronage, corruption and other types of opportunism.

A credit market differs from standard markets (for goods and services) in two important respects. First standard markets, which are the focus of classical competitive theory, involve a number of agents who are buying and selling a homogeneous commodity. Second in standard markets, the delivery of a commodity by a seller and payment for the commodity by a buyer occur simultaneously. In contrast, credit received today by an individual or firm in exchange for a promise of repayment in the future. But one person's promise is not as good as another. Promises are frequently broken and there may be no objective way to determine the likelihood that promise will be kept Jaffee and Stiglitz, (1990).

MFIs in many developing countries hold a truly alarming volume in non-performing assets. Differences between promised and actual repayments on loans are the result of uncertainty concerning the borrower's ability or willingness to make the repayments when they are due which creates the risk of borrowers default Vigano, (1993). The inapplicability of the standard demand and supply model for credit market give rise to credit rationing phenomena. Credit rationing as defined by Jaffee, (1997) is the difference between the quantity of loans demanded and loans supplied at the ruling interest rate. In this case, lending institutions make use of their own screening criteria to identify credit worthy borrowers to decrease the probability of default.

2.7 Cost of transactions and risks.

In the past decades, there have been major advances in theoretical understanding of the workings of credit markets. These advances have evolved from a paradigm that emphasis the problems of imperfect information and imperfect enforcement Hoff and Stiglitz, (1990). They pointed out that borrowers and lenders may have differential access to information concerning a projects risk, they may form different appraisal of the risk. What is clearly observed in credit market is asymmetric information where the borrower knows the expected return and risk of this project, whereas the lender knows only the expected return and risk of the average project in the economy.

Lending institutions are faced with four major problems in the course of undertaking credit activity to ascertain what kind of risk the potential borrower is adverse selection and to make sure the borrower will utilize the loan properly once made, so that he will be able to repay it moral hazard. To learn how the project really did in case the borrower declares his inability to repay and to find methods to force the borrower to repay the loan if the borrower is reluctant to do so enforcement Ghatak and Guinnane, (1999). This problem of imperfect information and enforcement leads to inefficiency of credit market which in turn leads to default. Thorough credit assessment that takes into account the borrowers character, collateral, capacity, capital and condition what is normally referred to in the banking circles as the 5C`s should be conducted if they are to minimize credit risk.

Although fixed repayment schedules bear major benefits for the microfinance institutions they are imposing significant drawbacks at the same time. Firstly, regular repayment in small amounts increases the number of transactions and hence the transaction costs for both the borrower and the microfinance institution alike Shankar, (2006). Secondly, microcredit clients do not typically have smooth income throughout the year. Seasonal production and seasonal income streams generate a cash flow disconnect, and given the presumed liquidity

constraints of the typical microcredit client, this is resolved either through underinvestment, sale of productive assets, failure to smooth consumption, or default on loan repayments.

Thirdly, fixed repayment schedules limit the types of activities and investments that can be financed by micro loans. Long gestation projects need time to realize returns and do not yield sufficient returns immediately allowing the borrower to start regular repayment directly after credit disbursement Field et al.(2011) even claims that fixed repayment schedules deter potential borrower from joining microfinance programs or existing clients from repeated borrowing. Karlan and Mullainathan, (2007) and showed that informal borrowing from moneylenders is a source of financing regular repayment instalments. They argue that microfinance institutions can harness local information from the moneylenders by designing repayment schedules that impose the necessity to cross finance repayments when incomes are fluctuating. Hence, only clients who passed the screening process of a moneylender will apply for a microfinance loan with regular repayments.

One of the main obstacles to the expansion of microfinance, according to the CGAP, is the high interest rates that MFIs charge on loans: the industry average is 28 percent annually, with standard rates varying from 25 to 100 percent. MFI interest rates are a function of four primary costs: the cost of money, the cost of loan default, administrative costs, and return on investment Bowers, (2007).MFIs are increasingly interested in ways to capitalize on the reliability and cost savings mobile money provides to both institutions and clients. Since MFIs lend out small increments of money to people in rural areas, they face high transaction and labour costs. A member of the CGAP recently identified administrative costs, especially transaction costs, as the primary cause of high MFI interest rates, particularly in rural and disconnected markets. Mobile money presents an opportunity to reduce transaction costs by replacing costly labour with less expensive, automated technology and decreasing transportation costs associated with disbursing loans and collecting payments. For example, mobile money helped Peru's BancoCredito reduce its per-transaction cost from eighty-five cents to thirty-two cents Nicholson, (2007). Similarly, Pakistan's Tameer Bank estimates that set-up costs for a mobile agent are thirty times lower than for a branch and those monthly operations costs are ninety times lower Bowers, (2007).

Beyond reducing costs for MFIs, mobile money may also decrease default rates and credit risks as clients reallocate the time formerly spent travelling to banks to income-generating

activities. According to World Bank research, mobile money's ability to grow and ease of use could foster wider penetration of MFIs, decrease defaults on loans (by providing people with the flexibility to repay loans at any time), and decrease transaction costs associated with repaying loans. Mobile phones can also allow clients to easily send updates regarding their progress either to MFIs or to MFI donors. Mobile money will help MFI clients accumulate wealth from productive activities, purchase insurance to smooth income during a crisis, and make payments when necessary. While mobile money is a poverty reduction tool in itself, it is also a tool for MFIs to expand at a faster rate and attract a greater share of the world's population into the formal banking sector CGAP, (2010).

2.8 Theoretical framework

Consumers' behaviour in terms of loan repayment and flexibility: Credible commitments are important for poor households who have difficulty in repayment. Such difficulty can be due to poor self-control, inattention to planning or family members asking for money insistently. The proliferation of informal financial devices, such as rotating savings and credit associations (ROSCAs) and deposit collectors, shows that the poor feel the need for commitments Rutherford, (2000); Johnson, (2004); Guerin, (2011). In addition, rigid microcredit contracts with a weekly repayment schedule are popular among people with self-control problems Bauer et al., (2008). Product flexibility refers to the ease with which financial transactions are adapted to clients' cash flow Collins et al., (2009). Contrary to the typical enforcement mechanisms used in microcredit products, flexible products allow for grace periods in loan repayment; provide for adaptable instalment schedules to avoid burdening clients with high repayments in difficult times; and allow for loan prepayment, loan renegotiation in the case of an income shock, and loan refreshing at some point during the loan cycle Collins et al., (2009).

2.9 Conceptual framework.

The conceptual framework in Figure 1 presents the interrelationship in the study, the key variable involved and how they are interrelated, the decision to be awarded loan to a small scale dairy farmer will depend on the social economic factors of the farmer (age, farm size, gender, farmer experience, educational level) the MFI decision to disburse the loan will

depend on the disbursement factors like the (client screening, collateral, rationing and efficiency of the MFIs),the repayment of loan by the dairy farmer will depend among various variables flexibility of the loan schedule , outcome is for the small scale dairy farmer to get repeat loans, increased productivity and reduction of poverty

Demographic characteristics

- Age
- Gender
- Education level
- Farming

Independent variables

Farmer's awareness

- Farmer trainings
- Information access
- Collaboration and linkages
- Farmer's experience

Digital financial services

Banking

Efficiency

Time saving
No hidden charges

No limit of maximum and minimum

Improved repayment due to the use of digital financial services

Schedule is adjusted to the income flow

Intervening variables   Dependent

Patterns of DFS, particularly in relation to saving, borrowing and repayment

- Disbursement factors
- Vulnerability factors
- Social economic

Figure 1 : The conceptual framework

CHAPTER THREE

METHODOLOGY

3.1 The Study Area

The study area is Nakuru Municipality. It is located in the Great Rift Valley, latitude $0^o8'$, $11.16''$S longitude $36^o4'48.09''E$ 160 km Northwest of Nairobi. The total area of the municipality is 300 km2. Major economic activities in the municipality include grain mill, crop marketing, woodwork, metalwork, crop production, store construction, livestock rearing, clinic, hotel, dairy, supermarket, and transport among others (Nakuru municipal council). We have three major dairy processors which are KCC, Brookside, Happy Cow and several milk bars, the area under natural grass is 15 hacters, 5 hacters under improved pastures and legumes 0.5 hacters.In terms of loan distribution, the lion's share of the total loan portfolio was with in agriculture during the years under consideration ranging from 47% in 2005/2009 to 63% in 2010/12. The loan balance among industrial projects was higher than that of service sector.

Figure 2 : Map of Nakuru Municipality

3.2 Research Design

This is the framework that assisted the researcher to structure the collection of data, analysis and the interpretation of data. The study adopted a qualitative case study research design. According to Yin (2003) a case study design should be considered when: (a) the focus of the study is to answer "how" and "why" questions; (b) you cannot manipulate the behavior of those involved in the study; (c) you want to cover contextual conditions because you believe they are relevant to the phenomenon under study; or (d) the boundaries are not clear between the phenomenon and context. This approach has the potential to deal with simple through complex situations. It enables the researcher to answer "how" and "why" type questions, while taking into consideration how a phenomenon is influenced by the context within which it is situated. A case study is an excellent opportunity to gain tremendous insight into a case. It is argued that a case study provides a more realistic response than a purely statistical survey and it enables the researcher to gather data from a variety of sources and bring together the data to illuminate the case. This study will use primary data which will be gotten by conducting a household survey. The survey strategy is appropriate when the researcher wishes to use the findings to infer on the whole population. Survey allows the collection of large amount of data from sizeable population in a highly economical way. The primary data was collected from a sample of small scale dairy farmers through structured questionnaires prepared for the study. Information pertaining to the respondent household demographic and socio-economic characteristics was obtained directly through the microfinance loan application forms that were held at the branch office of Nakuru.

3.3 Target population

The target population was all small scale dairy farmers who obtain loan from micro finance - Micro Kenya limited (MKL) Nakuru branch in the study area formed target population. We have approximately 1418 borrowers in MKL within municipality with an average of 281 small scale dairy farmers as borrowers (Micro Kenya loan book). The focus was analysis of the questionnaire which was used to guide the interviewer of the sampled respondents. A part from this 5 key informant from MKL; 4 ministry of livestock officials and 1officials from Kenya dairy board were included in the study population.

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3.4 Sample Design

The sampling plan describes how the sampling unit, sampling frame, sampling procedures and the sample size for the study. The sampling frame describes the list of all population units from which the sample will be selected using the formula

$$\mathbf{n} = \frac{\mathbf{N}}{\mathbf{1+Ne^2}}.$$ (Pagoso, et al, .2008 p.46)…………………….. i)

Where:

n = sample size

N = the size of the population

e = margin of error

Margin of error was 5%

A total of 165 borrowers were selected from MKL's who are dairy farmers.

3.5 Sampling procedure

Multistage sampling procedure was used in which first Nakuru Municipality was selected purposively because it has large number of farmers and the region proportionally large part of the country. Then using the stratified sampling method borrowers who were dairy farmers in MKL were identified sub grouped according to the age of the loan with proportional representation and randomly selected a total of 165 borrowers were listed on the branch's chart of loan account out of which the repayment date for 14 borrowers was not matured, and hence are excluded from the list. Of the rest 151 borrowers whose maturity period has reached, 109 (72.5%) are credit worthy borrowers while the rest 42 (27.5%) are defaulters. A sample of 100 borrowers out of which 68 credit worthy ones and the rest 34 defaulters were interviewed. The proportion of the loan repayment status groups of the population was kept in selection of the sample except a slight round off error. Possible effort was exerted to keep the loan by dairy economic activity.

3.6 Method of data collection

The primary data was sourced through interviews using semi-structured questionnaire that was administered to small scale dairy farmers. This survey includes information that is obtained from borrowers as well as concerned MKL officials and documents that was obtained from MKL Nakuru branch. Furthermore, information that was obtained from, discussion that was held with some beneficiaries of the program and through direct observation from site visit was employed to have a general idea of the lending procedure from group formation to loan recovery.

3.7 Data Analysis Technique

Both qualitative and quantitative methods were used to analyse the data. Qualitative analysis was used to analyse the general financial attitudes and behaviours of small scale dairy who are users of digital financial services and to establish how farmer's awareness and knowledge on digital financial services affects its usage and repayment .Where notes were taken, they were organized to manageable forms to enable summarized interpretations to be made. The final conclusions were arrived at after careful verification of the data collected and interpreted.

Quantitatively, data from the structured questionnaires was edited and processed. It was then coded to enable categorization into groups and entered into SPSS. Descriptive statistics was then used for the frequencies and percentages as per the results obtained.

3.8 Operationalization of Variables

The Operationalization of a variables means manipulating both the independent and dependent variables in such a way that they and end up having a few levels thus becoming measurable.

Table 1 Operationalization of Variables

General objective	Type of variable	Indicator	Measure	Measuring scale	Type of analysis
Establish awareness and knowledge on digital financial services	Independent *Farmers awareness*	Farmers Trainings. Dairy farming experience Information access. Chamas	Number No of years List of source No of tours	ratio	Mean
general financial attitudes and behaviors of small scale dairy farmers	Independent *Demographic*	Gender involvements in DFS Marital status Age	Type Type Number	Nominal Nominal ratio	mean - mean
patterns of digital financial services use	Independent *In terms of saving ,borrowing and repayments*	Deposits Borrowing Repayments Withdrawals	Numbers	Ratio	Mean

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION, INTERPRETATION AND DISCUSSION OF

# FINDINGS

4.1 Introduction

This chapter presents and discusses findings of the study which have been discussed under thematic areas and subsections in line with the objectives of the study. Much of data in this study is quantitative and therefore quantitative methods of analysis are used where by descriptive statistics have been used to analyze the quantitative data. Specifically, frequencies distribution tables are used to summarize and present data in relation to the study objectives. This chapter explores the demographic characteristics, occupational profile and financial behaviours of the small scale dairy farmers in Nakuru County who are service users of the digital finance services.

4.2 To determine the general financial attitudes and behaviours of small scale dairy who are

users of digital financial services using the demographics

This section provides a description of the sample of the respondents interviewed during this study. The survey sample of 168 people comprised of 102 customers and 19 non-customers. The focus group discussions involved a 47 people comprise 25 customers and 22 non-customers. The respondent's profiles provides a background against which we contextualise the respondent's current payment of loans situations, use of the digital finance loans and repayment capacity. The study findings make attempt at predicting current and latent demand for the digital financial products. The next sub-sections explore such key variables as age at the time of the survey, marital status, level of education, and how these factors related to respondents current digital financial services and repayment rates.

The demographic profile of M-Shwari users was used as the profiles of mobile money users, as well as active mobile money account holders. Compared with the general small scale dairy farmers population in Nakuru County.

Table 2 Dairy farmers who use the digital financial services

Dairy farmers who use digital finacial services
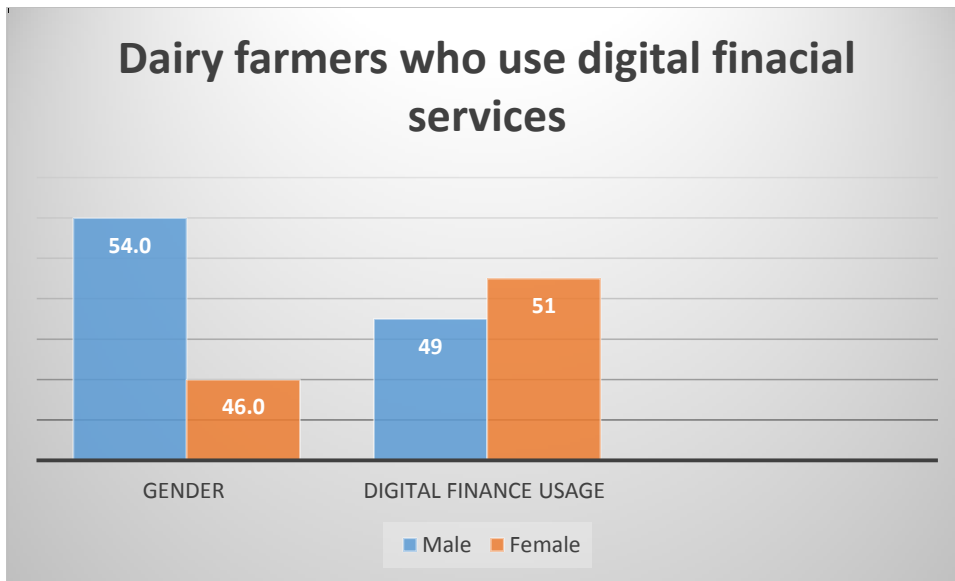
From the sample 54% were male and 46% female Compared to the general adult population 10 percent of the farmers indicated that they have used the digital finance which is the M-Shwari during the study. From the figure above the female dairy farmers tend to use the mobile services more than the male counter parts farmers.

Table 3 Digital financial services users and dairy farmers by age

DIGITAL FINANCIAL USERS AND ALL DAIRY FARMERS BY AGE
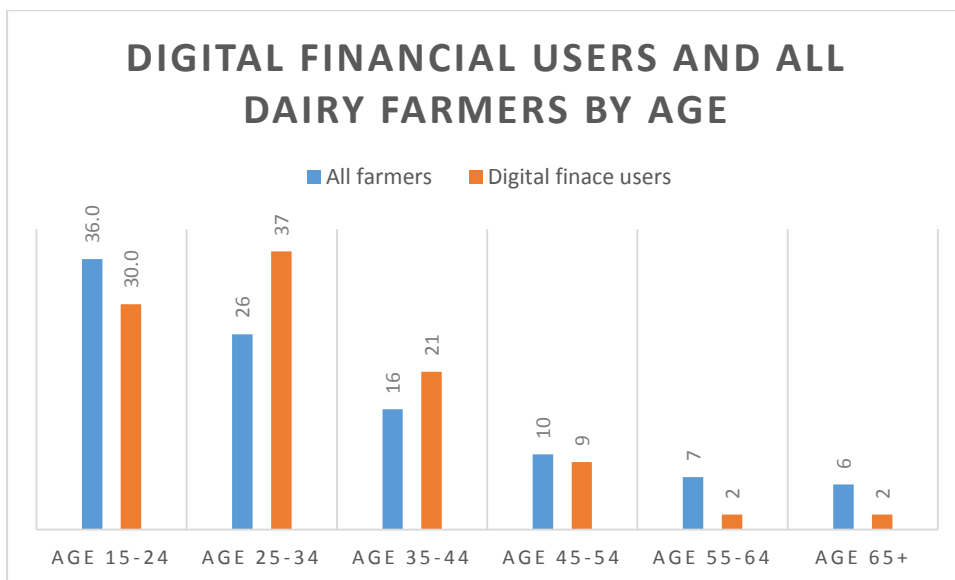
The digital financial farmers users tended to be very young: 67 percent of users are between 15 and 34 years old (Figure 3). They also tended to be more educated with much higher education achievements .This section explored factors that enhance repayment capacity and

demand for mobile loan products loans. The factors included level of education. An analysis of these variables provided the socioeconomic context

Table 4 Level of Education

of the respondents and potential customers of the usage of the mobile banking products
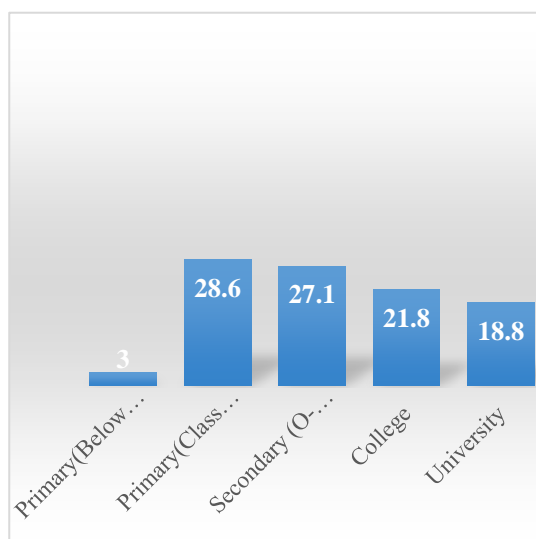
Level of education

Level of education affects the person's attitudes and outlook on decisions about technology and repayment. This is viewed as important with regards to the loan facilities component of the MKL loan product.

The study showed that majority (70%) of the respondents had attained secondary and college level of education. Only about one third (31.6%) had primary school education. As shown in Table 4, one in five respondents had university education. This is because most of MKL clients dealing with dairy farming were in the peri urban settlements of Nakuru municipality.

Table 5 percentage of digital financial users by level of education
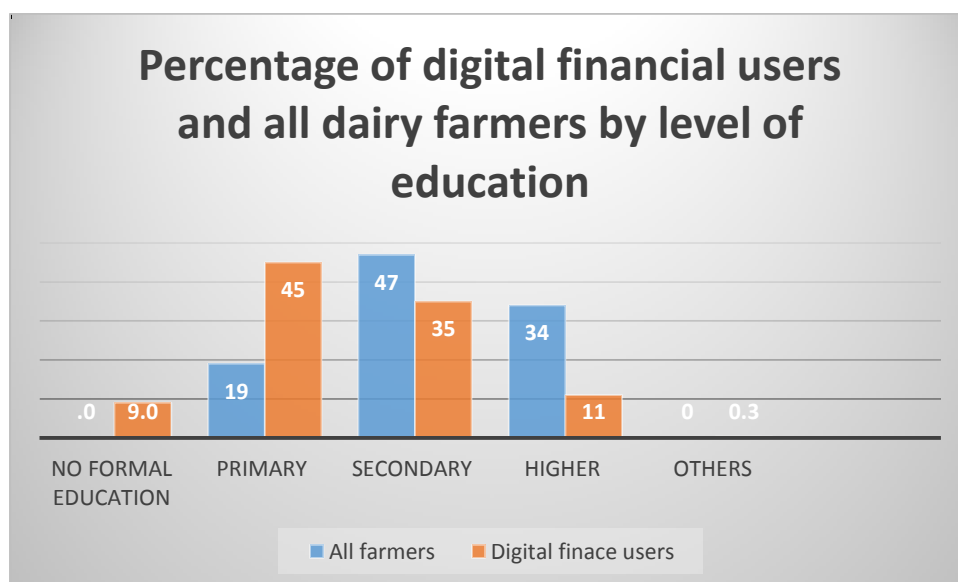
It is important to note that the potential clients who were willing to adapt the mobile money technology were highly educated hence have better understanding of financial services and mobile money matters. Focus group discussion sessions revealed that both customer and non-

customers were very much aware of the competing financial institutions in study locations. This level of general education and awareness of financial services is positive for digital finance services since it will lead to quick product uptake by the dairy farmers. However, it may also pose a challenge when customers critically compare the product with competitor's offerings and /or products offered by MKL. With one third of respondents having relatively low level of education, there is also high likelihood that some customer will require some level of product education / awareness for mobile banking services.

Type of Household's Livelihoods

With regards to household source of income and livelihoods, the respondents were asked about the main source of income of the head of the household. We found that business / trade was a dominant source of livelihood in both study locations with 50% of respondents Table 7 Types of household livelihoods

Table 6 Type of household livelihoods
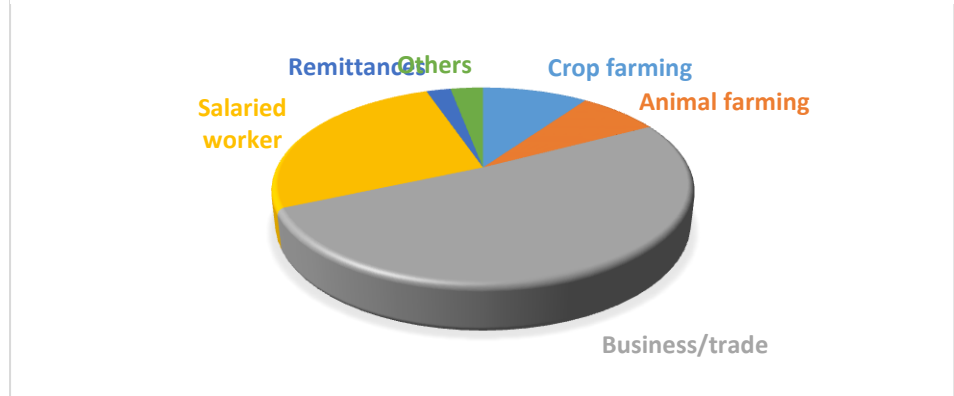
reporting this as the main source of income for the family. Slightly more than one quarter (26.3) of the heads of households were employees. Overall less than one on five households in the study locations depend solely on agriculture with 17.3% dependent on animal production and 9.8% on crop production. Dependence on agriculture was frequently reported in rural areas where more than 60% of households reportedly have dairy animals and supply milk to the local dairy companies. From the foregoing, as expect business / small trades was the main source of income in urban and peri-urban settlements. Agriculture is the main source of income in more rural and farming locations. There were multiple sources of income among the target customers and this assures quick and positive loan performance in terms of repayment.

Source and Level of Individual Income

Levels of income is directly related to an individual's capacity to secure and pay loan facilities either through sale of milk, salaries or business income. Income plays an important role in decisions around borrowing and shaping repayment pattern situation. All the respondents that were interviewed had a regular source of income in the past 12 months. Majority (75%) of them either earned income from businesses / trader (45%) or employment (30%) followed by crop farming (8.3%) and remittances (5).Further analysis showed that the income varied by gender and type of occupation.

4.3 To establish how farmers awareness and knowledge on digital financial services affects its usage and repayment

This section of the study discusses the current status and situation of the respondents. Based on the findings of the study , there was a significant increase in reported M-Shwari use among the general dairy small scale dairy farmers and mobile money users, although awareness of the product remains a challenge among the farmers .

Table 8 Farmers that have ever used M-Shwari
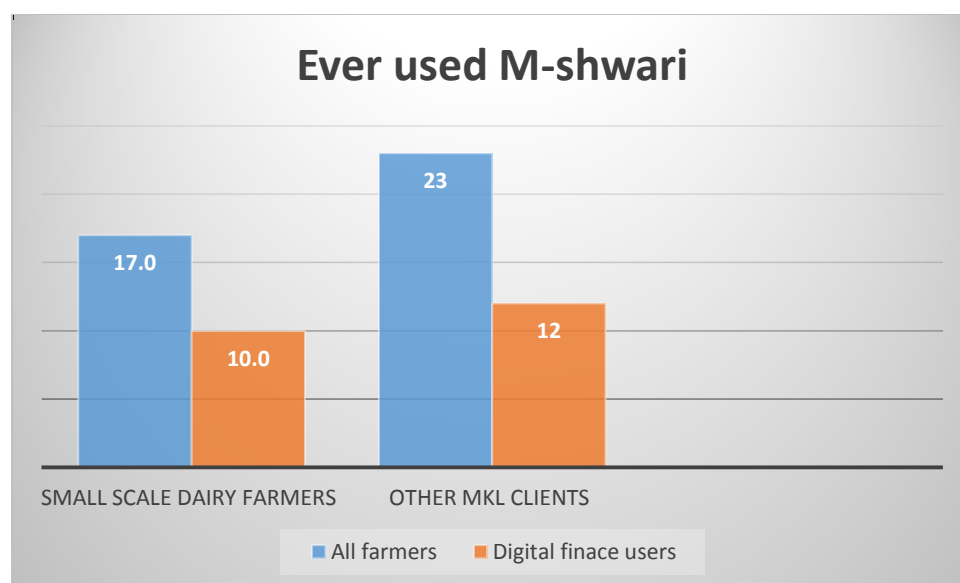
The overview of the demographic profile of m-Shwari demonstrates that there is a higher number of MKL clients who are using the digital financial services than the dairy farmers. While more than 60 percent of mobile money users who are clients of MKL were able to recall M-Shwari spontaneously or when prompted, only 12 percent said they were using the service. The group of farmers who are aware of M-Shwari but do not use the service are very

different in their characteristics from those who use M-Shwari (Figure 10). The farmers were somewhat dominated by the traditionally disadvantaged populations: farmers, those living in rural areas and those below the poverty line. The farmers were also older than the group of M-Shwari users. They are not as educated as M-Shwari users, with only half reporting secondary education or above compared with 81 percent for M-Shwari users. Finally, their ownership of mobile equipment and financial services (a bank account or a mobile money account) are lower than those of M-Shwari users

4.4 Mobile ownership

Slightly more than one half of the respondents had their own mobile (78%) or family owned (5%) mobile. In either case, qualitative discussions indicated that there was demand and aspiration to either acquire the phone from dependants or buy new ones. However, the many focus group discussants asked about the requirement of mobile banking products /or the procedure of how to use the mobile technology in Micro Kenya limited (MKL). It was apparent that many discussants did not have knowledge and trust in the mobile technology .farmers and the family owned dairy farms were not aware of where of the digital finance and the products that was offered in the mobile banking. There is likelihood that trust /or mobile ownership is likely to be a game changer in the mobile banking space and there will be need to develop innovative means educating famers on the use of the technology.

4.5 Econometric analysis: of dairy farmers using mobile banking

Table 9: Percentage of farmers who are using mobile banking

Mobile banking rate	Y codes	Percentage frequency
Yes	1	39%
No	0	61%

The research with 109 farmers looked at smallholders' use of cash and their levels of savings, spending, borrowing and financial literacy. It revealed that 34% of the survey participants received between 1 to 12 cash transactions per year for their dairy milk and 62% of the participants received between 13 to 24 cash transactions per year. This was a hugely

important quantification of the digital finance market opportunity for the MKL. It was also learned that 67% of the farmers were interested in mobile money and that 46% and 36% already save and borrow, respectively. Finally, the insight gained about precisely where and how they pay their loans money can help to identify and subsequently develop flexible payment modes aligned along the dairy farmers—that essential space where the farmers live and work. According to this study future investment will have to be made to reach out to more rural agents and that carefully identifying the right areas to put mobile money agents is critical. In each case, farmers perceived four barriers to rolling out digital dairy income and loan payment schemes in rural areas. These barriers were: illiteracy, financial illiteracy, digital illiteracy and lack of trust. In the case of illiteracy, financial illiteracy and lack of trust, agriculture developers have many decades of experience successfully dealing with these barriers in order to transfer knowledge about good agriculture and agriculture finance practices.

Overall, those farmers who were aware of M-Shwari but choose not to use the service are less well-off and do not have the same experience with/exposure to financial services as M-Shwari users. While individually, these characteristics were not barriers to taking up M-Shwari, in combination, they can make the M-Shwari nonusers less open to new products as they have limited funds and limited knowledge of financial institutions/products. Thus, they might have less trust for M-Shwari as a place to store their funds.

Nevertheless, dairy farmers of this group had the potential to become M-Shwari users. Most of them already had a mobile money account (92 percent). A few had already tried using mobile money services for savings (8 percent) and loans (1 percent). A promotional campaign offering a small financial incentive for trying the product, with no risk to their own funds, might stimulate trial use of digital financial services among nonusers.

4.6 Patterns of digital financial services use, particularly in relation to borrowing and repayment by dairy farmers in MFIs

The study further sought to understand the extent to which mobile banking services form part of the finance process and whether these services could be enhanced and if so, how. The study examined the kind of loan support services accompanying dairy finance and sought the views of the respondents on these services. Many respondents recommended that MKL

should put in place clear guidelines on how to access and use the mobile banking services. The potential customers agreed that there was need for training and provision of technical services to help them make informed choices during loan application, processing and disbursement. A large proportion (64.7%) of the respondents would pay professional advice due to the risks involved in using the technology.

In addition to Chama's and banks, friends and family, as well as hiding places, remain common avenues for money storage for the dairy farmers, especially for temporary storage. These two resources for money storage share two characteristics. They are well-known and trusted and there are no fees associated with depositing/storing money. While M-Shwari has been in the market for more than two years, it is still a new product for many and most of the financial activities available with M-Shwari have a cost or fee attached to them.

4.7 Benefits and Challenges When Borrowing from digital financial services

Among all farmer respondents (N=168), 24 M-Shwari users (22 percent) answered the following question: "How did the cost of your last M-Shwari loan (i.e., the 7.5 percent loan facilitation fee or interest rate) compare with the cost of other loans you have taken out in the MKL?" Only one person felt M-Shwari was much more expensive and two thought it was about the same. Twenty-one users said the cost of their last M-Shwari loan was cheaper or much cheaper compared with the cost of loans from other formal and informal institutions.

- **Low level of understanding of the product:** Many farmer respondents did not know how to check their loan limit prior to submitting an application
- **Technical issues when accessing the M-Shwari account:** A small number of farmers who are M-Shwari users reported experiencing problems accessing their M-Shwari accounts.
- **Loan limit is perceived as insufficient/low:** Of those who had successfully borrowed money with M-Shwari, approximately a third were unable to borrow as much as they needed.

4.8 Major distinguishing features characterizing defaulters and credit worthy farmers

Products and Services in Micro Kenya -Group Lending Loans: These are loans extended to dairy farmers who lack traditional collaterals. They form groups with a membership

ranging from five (5) to thirty (30) individuals. All potential clients should be operating small and micro enterprises. Members self-select each other and during the period, members are inducted on the best practices of group lending and the co-guarantee mechanism. Once the induction sessions are complete to the satisfaction of MKL, the group is able to access loans. Neither formal collateral nor a credit history is required to qualify for a loan, but the co-guarantee mechanism and peer pressure must function for each lending structure to mitigate on lending risks. The key requirements to qualify for the group product are: Have a national Identification Card, Be a member of a group with an average of 10 members and each member should have been operating a dairy farm business for a minimum of 6 months.

Loan terms range from one (1) to Eighteen (18) months, while loan amounts range from Ksh10, 000 to 1,000,000. Clients are required to maintain a loan guarantee fund, equivalent to 15% of the loan disbursed. Most of the dairy farmers had taken this product to purchase the animal feeds and working capital.

4.9 Main advantages of digital financial services

The following three key features allow digital financial services to provide farmers with a "banking experience" that is perceived superior to that of a traditional bank and the MFIs:

- **Digital finance is a one-stop shop for several financial activities.** Mobile money allows farmers to consolidate their activities by providing savings and borrowing tools. Interactions/transactions between M-PESA are mostly smooth, which means small scale farmers can benefit from an extended range of financial services

- **Digital finance is available whenever and wherever you need it;** this is especially important in emergency cases -- even those stranded in remote areas in the middle of the night can get access to a loan or their saved funds. Users do not need to go to a MFI branch, wait until they open and stand in a queue to be served.

- **Digital platform is a safe place to store money; saving activity is confidential.** Several respondents mentioned that the security of their funds is the most important feature. Neither outsiders nor family members or friends can find out whether and how much a farmer saves with, even if they gain access to their mobile phone.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter therefore contains a summary of the findings, discusses these findings and furnishes conclusions based on the objectives of the research study. The chapter also contains some recommendations for consideration based on the study findings. The tail end section deliberates on the contributions of the study to the general body of knowledge..

5.2 Summary of the Findings

The study findings indicate that mobile phones have significantly changed the way rural businesses are being conducted. Of 109 respondents who answered the question on the contribution of mobile phones to their businesses, nearly three quarters (72.6%) reported that their business activities were positively (improved or greatly improved), instead of travelling to Nakuru town city to buy goods, farmers could check goods and prices with different shops, make orders by using mobile phones, and arrange payments through Mpesa. The findings therefore suggest that mobile phones are improving business activities by helping rural farmers to find better market and price information, making advance arrangements with suppliers and customers, as well as saving time and money by avoiding unnecessary travel. Since, business is an information-rich activity, the main value of mobile phones in improving rural businesses lies in the ability to promptly communicate business information, reduce costs, and speeding up transaction processes.

Of 109 respondents who answered the question on the contribution of mobile phones to market information for agriculture and dairy produce, more than half (45%) said that mobile

phones had enhanced (improved or greatly improved) their ability to access such market information. Additionally, dairy farmer's participants reported that they had been using mobile phones to directly discuss prices with buyers and crosscheck prices for their milk produce, instead of relying on middlemen or a few buyers. Mobile phones were also reported as being of great help when making decisions on the best time to sell milk and animals as farmers could have instant information about prices. These findings suggest that mobile usage enables rural farmers to access to better markets and prices for their produce and were able to overcome the problem of being cheated by middlemen. Previous studies (Molony, 2008) have indicated that farmers have often complained about the low prices for their produce. They often felt that they are being cheated by the middlemen, who rarely reveal market prices. On the loan repayment the farmers 61% said that they only receive the loan through the mobile phone and are yet to make payment through phones the microfinance allowed clients to make deposit through groups and no individual deposits, the microfinance officials said that if they allowed the individual deposit then they would kill the group guarantee mechanism and weaken the attendance of the meeting so they only allowed individual borrowers to use the Mpesa on the loan repayment. On the other hand Of 109 respondents who responded to the question about sending and receiving money through mobile phones, more than (87.1%) of them reported that mobile usage had enhanced

5.3 Conclusion

M-Shwari is the best known value-added digital financial service in the Kenyan market. It is also a well-liked product, with nine in 10 farmers saying they will continue using it and will recommend it to other people. Despite high awareness and high user engagement, M-Shwari has been experiencing a low conversion rate with about one in six of those aware of M-Shwari actually using the service. M-Shwari users also have better exposure to formal financial institutions, including borrowing money from and saving money with banks, other than CBA. The M-Shwari user group includes only a small number of adults who have limited access to formal financial services and to formal and informal credit; most of these individuals are rural females and rural males.

Digital finance farmers do not have a clear understanding of the savings offer and mostly turn to the service for easy/fast and relatively cheap loans. Even in the case of loans, few have a

clear understanding of how the loan limit is calculated and end up testing the system before they actually start borrowing and/or saving money.

Finally, the combination of small loan amounts and a short repayment period limits the use cases for M-Shwari, even as a source for emergency loans. The bulk of current users say they use digital finance to help them manage short-term ups and down in cash flow as well as to save for short-term goals. M-Shwari is a complementary product to other formal and informal financial institutions that are used, and is responsible for a relatively modest portion of farmers borrowing and savings activities.

Overall, from the makeup of the small scale farmers and the pattern of product use, digital finance is just moving up from the user trial stage. While M-Shwari is well liked by the users, they still are not completely clear about all of the features and rules about use (e.g., loan limits, repayment periods). Comprehensive educational efforts combined with a promotional campaign to encourage small scale farmers be aware of M-Shwari to try it can help resolve confusion about its services and use, and encourage both users and potential users (those aware but not currently using M-Shwari) to further explore this service.

5.4 Recommendation.

Very few farmer respondents had suggestions for improving their experiences with digital finance beyond addressing existing disadvantages. However, among those who did provide suggestions for improving the user experience, at least half were expecting more comprehensive and more frequent engagement between users and the digital finance provider like the M-Shwari provider.

In particular, small scale dairy farmers suggested the providers of digital finance services organize promotional campaigns to explain how digital finance works. They also wanted to see an active customer service effort to work with borrowers to help them develop a repayment plan and to initiate reminder calls about repayment deadlines.

Another group of M-Shwari users who were dairy farmers recommended the service separate itself from M-PESA to ensure better security of the money deposited by users. In particular, they wanted to have separate PIN codes for M-Shwari and M-PESA, and also be able to deposit money directly to M-Shwari, without having to transfer funds from M-PESA.

However, none of these farmer respondents said they want to lose the convenience of transferring money.

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APPENDIX

Questionnaire

This survey questionnaire seeks to determine loan repayment performance and evaluate the effects of a flexible repayment and using m-banking on loan default among small-scale dairy farmers in Nakuru municipality. Thus, your response to this questionnaire will serve as source of information to the research paper to be done for thesis purpose. Any response you provide here is strictly confidential and will be used exclusively for the research purpose. Your honesty in responding the right answer is vital for the research outcome to be reliable.

Enumerator's Name: _____

Questionnaire No.: _____

Date: _____

Please complete the section by ticking the options applicable to your statement.

Section A: Demographic details

	User Demographics	Categories	Mark applicable with cross (X)
Q1	Where do you stay? (Provide area & province)	Division………………… Location… Sub location………………	
Q2	Gender	Male	
		Female	
Q3	. Household Size (Number of dependents in		

	the household)		
Q4	What is your age?	………………YEARS	
Q5	Work Status	Working	1
		Housewife	2
		Student	3
		Self- Employed	4
		Unemployed	5
		Pensioner/Retired	6
Q6	Income Level	No income	1
		Between: 1,000 –5,000	2
		Between: 5,001- 7,500	3
		Between: 7,501 – 10,000	4
		Between: I0,001 – 20,000	5
		KSH 20,000 and higher	
Q7	years of experience	Less than a year	1
		1-5 years	2
		6-10 years	3
		More than ten years	4
Q8	Education Level	No Formal or Some primary school	1
		Primary school completed	2

		Some high school	3
		Technical/apprenticeship	
		College / University	4
Q9	Do you have or use a cell phone?	Yes	1
		No	2
Q10	Do you have a bank account?	Yes	1
		No	2
Q10	Time to get the nearest bank (branch)	Less than 20 Minutes	1
		Less than 45 Minutes	2
		More than 1 hour	3
Q11	Do you use mobile banking?	Yes	1
		No, but I will use if affordable, convenient , other reasons.	2
			3
		No, not interested	4

Q12	If yes, What do you use mobile banking for? (Tick whatever is applicable)	Buy airtime	1
		Check account balance	2
		Transfer money	3
		Pay loan accounts	4
		Pay electricity	5
		Cash withdrawal	6
		Others	6
		Not Applicable	7

Q13	Do you have any of the following at home? (Tick applicable)	Electricity	1
		Tap water	2

Section B: Five-point Likert Scale Questionnaire

Please complete the following questionnaire on a scale of 1 to 5. 1-strongly disagree and 5-strongly agree

Item	Construct	Strongly disagree	Disagree	Not Sure	Agree	Strongly agree
Q14	I think that using mobile banking would enable me to accomplish my loan more quickly.	1	2	3	4	5
Q15	I think that using mobile banking would make it easier for me to carry out my tasks. (loan repayment)	1	2	3	4	5
Q16	I think that mobile banking is useful.	1	2	3	4	5
Q17	Overall, I think that using mobile banking is advantageous	1	2	3	4	5
Q18	I think that learning to use mobile banking would be easy.	1	2	3	4	5
Q19	I think that interaction with mobile banking does not require a lot of mental effort.	1	2	3	4	5
Q20	I think that it is easy to use mobile banking to accomplish my banking tasks.	1	2	3	4	5
Q21	Mobile banking services may not perform well because of network problems.	1	2	3	4	5
Q22	Mobile banking services may not perform well and process payments	1	2	3	4	5

	incorrectly.					
Q23	When transferring money through mobile banking, I am afraid that I will lose money due to careless mistakes such as wrong input of account number and wrong input of the amount of money.	1	2	3	4	5
Q24	When transaction errors occur, I worry that I cannot get compensation from banks	1	2	3	4	5
Q25	I'm sure that if I decided to use mobile banking and something went wrong with the transactions, my friends, family and colleagues would think less of me.	1	2	3	4	5
Q26	Using mobile banking services would lead to a loss of convenience for me because I would have to waste time fixing payments errors.	1	2	3	4	5
Q26	It would take me lots of time to learn how to use mobile banking services	1	2	3	4	5
Q27	I would not feel totally safe providing personal privacy information over mobile banking.	1	2	3	4	5
Q28	I'm worried about using mobile banking because other people may be able to access my account.	1	2	3	4	5
Q29	I think the equipment cost is	1	2	3	4	5

	expensive to use				
Q30	I think the access cost is expensive to use	1	2	3	4	5
Q31	I think the transaction fee is expensive to use	1	2	3	4	5
Q32	Mobile banking service providers have the skills and expertise to perform transactions in an expected	1	2	3	4	5
Q33	Mobile banking service providers have access to the information needed to handle transactions appropriately	1	2	3	4	5
Q34	Mobile banking service providers are fair in their conduct of customer transactions.	1	2	3	4	5
Q35	Mobile banking service providers are open and receptive to customer needs.	1	2	3	4	5
Q36	Mobile banking service providers make good-faith efforts to address most farmers concerns	1	2	3	4	5
Q37	I believe banks are trustworthy.	1	2	3	4	5
Q38	I believe mobile network providers are trustworthy.	1	2	3	4	5

Section c. LOAN UTILIZATION

Q39	What was the purpose of the loan?	for working capital	1
		for fixed investment	2
Q40	Was the loan released in cash, cheque or mpesa ?	Cash	1
		Cheque	2
		Mpesa	3
Q41	Did you use the entire loan for the intended purpose?	Yes	1
		No	2
Q42	Did you get the loan at the right time?	Yes	1
		No	2
Q43	. If your answer to Q. 43. is No, what is the reason for delay?	Lengthy period the MFI took in processing……………	1
		Failures to timely provide the necessary documents by the guarantor ………..	2
		Failure of the guarantor to timely fulfill the preconditions stipulated on the loan contract……………..	3
		Delay in settlement of the previous loan………………….	4
		Others………………………………………….. (specify)	5
Q44	Did the MFIs visit the dairy farm site before approval of the loan?	Yes	1
		No	2
Q45	When do MFIs officers visit the project after it	1 regularly…………..	1
		2 only when default occurs…………….	2

	started operation?	3 others (specify) _____	3
Q46	Have you ever gone to the MFI after you took the loan?	Yes No	1 2
Q47	Were you well briefed about the loan contract before you sign it?	Yes No	1 2
Q48	How many times have you taken loan?		
Q49	. Was the loan you took recently (i.e. this active loan) enough for the intended purpose?	Yes No	1 2
Q50	What was the amount you requested?		
Q51	Do you believe that the loan has to be repaid to the MFI?	Yes No	1 2
Q52	Which of the following is the most important one in motivating you to repay your loan on time?	Not to loss collateral……………. To keep social status………………. In expectation of getting another loan………………… knowing that paying MFI loan is my obligation	1 2 3 4

		Easier mobile banking services	5
		Others ……………………specify	6
Q53	Is the repayment period scheduled enough?	Yes No	
Q54	How do you get the method of disbursement of the loan?	Suitable Not suitable	1 2
Q55	If your answer to Q54 is not suitable, what do you think is the suitable form of disbursement?		
Q56	Have you ever failed to repay according to the schedule?	Yes No	1 2
Q57	If your answer to Q 60. Is yes, how many times?	Once Twice Thrice More times	1 2 3 4
Q58	If your answer to Q 61 is yes, what was the reason for failure?	1 market problem………….. 2 technical problem…………………… 3 working capital shortage……………………..	1 2 3

		4 others (specify)	4
Q59	What mechanism you designed to pay the overdue loan balance?	1 change of the project site………………….	1
		2 loan diversion…………………………..	2
		3 sell of property…………………………..	3
		4 others (specify)	4
Q60	What alternative measures were taken on the side of the MFIs to improve the repayment situation?	1 loan rescheduling……………………….	1
		2 additional loan……………………………	2
		3 frequently insisting the promoter…………………………	3
		Prepayment	4
		4 others (specify)	5
Q61	How was the loan enforcement mechanism?	Effective	1
		Not effective	2

THANK YOU FOR YOUR HELP!

Please return to Oliver Barasa, Msc Agriculture and Applied economics (Egerton University)