
FACTORS INFLUENCING ACCESS TO AGRICULTURAL CREDIT BY SMALL-SCALE DAIRY FARMERS IN GITHUNGURI SUB-LOCATION, KIAMBU COUNTY

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ABSTRACT: *Small-scale enterprises have often been ignored by financiers when issuing credit, merely for lack collateral and financial farm records. These enterprises are often overlooked because of the difficulties that are encountered in administering credit, the risk involved and the default rate among borrowers. Though Small Dairy Farmers contribute over 60% of all the milk that Kenya produces annually, they still continue to face challenges accessing agricultural credit compared to the larger, well-established dairy firms. This study, sought to evaluate how collateral availability, farm management skills of the farmer and the interest charged on credit influence small-scale dairy farmers (SDFs) access credit in Githunguri Sub-location, Kiambu County. The study design adopted was the descriptive one with Githunguri Sub-location being the specific location of the study. A sample size of 100 respondents were selected using simple random sampling. Personal interviews were used to collect primary data using personally administered questionnaires while the analysis was done using Multiple Linear Regression, and Statistical Package for Social Sciences (SPSS). The findings revealed that a unit increase in the farmers' management skills would increase access to agricultural credit by 0.265 and a unit increase in collateral availability would lead to 0.654 increase in the scores of accessing agricultural credit. This indicated a significant and positive relationship between the two factors and access to agricultural credit. Regarding, the relationship between access to agricultural credit and interest rates was significant but negative. This meant that an increase in interest rates by one unit would decrease the scores of accessing agricultural credit by 0.579 while holding other factors constant.*

KEY WORDS: Small-scale Farmers, Agricultural Credit, Small-scale Dairy Farmers (SDFs)

INTRODUCTION

Background Information

Dairy cows in the world today total to 264 million, producing an average of 600 million metric ton of milk every year. This production contributes to the current value of the global dairy industry which is worth USD 335.8 billion (Burris & Whitsett, 2015). By 2019, this industry is expected to generate revenues worth USD 442.32 billion and the worldwide milk production is projected to amount to 732 million metric ton because of increased demand (Uddin & Hemme, 2014). The United States is the global leader in milk production, and produces over 90 million metric ton annually with only 9 million dairy cows whose production is very high. India has the highest number of dairy cows totaling to over 40 million with an average milk production of 60 million metric ton annually. Africa continent contribute only 5% of the global milk production and has 49 million dairy cows which is five times that of the USA. Kenya is among leading countries in milk production in Africa, together with Ethiopia, South Africa, and Sudan. Among the four countries, only Ethiopia and Kenya are self-sufficient.

In Kenya, Dairy farming contributes 14% to the agricultural GDP and an average of 7% to country's GDP and hence an important sector in agriculture (Muriuki, 2011). Dairy is among the largest and most sophisticated industries in Africa. It has an estimated population of dairy cows as 4.3 million and produces an estimated 5 billion liters of milk annually. According to (USAID, 2017), the sector provides approximately 1 million jobs annually at the farm level and an additional 500,000 in direct wage employment and at least another 750,000 in support services. The sector is mainly dominated by small-scale farmers who own over 80% of dairy cows (Ogutu & Bosire, 2015). There are over 1.5 million households with one acre or less who keep dairy cows. This accounts for 60% of the total milk production in the country.

Some of the regions where most small-scale farmers are found include; Rift Valley, Central and coastal regions in the country (Ogutu & Bosire, 2015). Majority of the Small scale Dairy Farmers (SDFs) keep at least 5 dairy cows and are concentrated in the semi-urban areas. The farmers mostly rear Friesian, Guernsey, Ayrshire, Jersey and indigenous breeds like the East African Zebu cows under intensive and semi-intensive units systems of production. The small-scale farmers produce over 60% of the country's milk, the rest is produced by large dairy farms (USAID, 2017). Despite this, small-scale farmers cannot compete with the large well-established dairy producers since they face various constraints especially in accessing the required factors of production. Labor is mostly provided by household members and land can always be substituted by improved technology. However, capital as a constraint proves to be the most challenging since it can only be substituted by personal savings or credit. These farmers face challenges of poor access to credit to substitute their personal savings.

Small-scale farmers only get a third of the total credit provided to the Kenyan agricultural sector which is estimated to a little over 10% of the total credit provided by financial institutions, the government included. The lack of credit availability especially to small-scale industry continues to curtail its performance (Smale & Mathenge, 2015). Of all the milk produced, only 87% of this is consumed on average. The remaining milk is lost through spoilage especially due to poor or no storage facilities such as coolers and refrigerators. These facilities are expensive and most small-scale farmers cannot afford them. With adequate access to performing agricultural credit, such farmers have the capacity to afford storage facilities and avoid milk wastage.

When issuing credit, small-scale enterprises have always been overlooked because of the cost of processing and providing small unsecured loans. Although SDFs require the credit more, large-scale dairy firms have improved access to agricultural credit (USAID, 2017). While Small-scale farmers, continue to face challenges accessing agricultural credit which would enable them to improve dairy farming techniques and increase their overall output. This study, therefore, sought to establish the influence of farmers' management skills, availability of collateral and interest rates on access to agricultural credit by SDFs in Githunguri Sub-location, Kiambu County.

Justification of the Study

Kenya is fast becoming a middle-class country which means that more and more people will demand dairy products like milk, cheese and ghee. Therefore, SDFs should be able to attain high

economic levels in order to meet this increasing demand for dairy products. To achieve these high levels of economic and financial competencies, most SDFs have to rely on agricultural credit to be able to finance their operations. In general, the findings of this study will be useful to small-scale dairy cow farmers within and without Githunguri Sub-county, agricultural credit lenders like banks, government lenders like Agricultural Finance Corporation (AFC), policy makers, extension workers and other researchers in future as material for reference.

LITERATURE REVIEW

Agricultural Credit

Agricultural credit is a type of financing that exclusively provides funding for agricultural producers and is mostly used to provide finances for agricultural purposes. This credit can be sourced from both the informal and formal sectors. The informal sector includes borrowings from rotating savings relatives, credit associations, friends, credit associations and in rare cases, shylocks. Formal sectors refer to the financial systems which observe regulatory measures and guidelines of the Central Bank. They include commercial banks e.g. Co-operative Bank, government banks and funds like the Women and Youth Fund and organizations like Agricultural Finance Corporation (AFC), and non-bank institutions such as Sacco and microfinance institutions. Tobias and Ndungo, (2016), observed that although banks were legally required to direct 20% of all their loans to agriculture, credit to agriculture is estimated to be less than 10% of the total credit issued through the domestic financial system. Out of this, 90%, goes to large-scale farmers leaving the small-scale farmers with only 10% of the issued national agricultural credit.

THEORETICAL FRAMEWORK

Financial Inclusion Theory

According to this theory, there is a process that is outlined to ensure every section of the society, including the sections that earn low income, have access to financial services at an affordable cost in a transparent way by formal lenders. Financial inclusion allows everyone to have equal eligibility for financial services (Muriuki, 2011). However, this is not the case especially among unemployed people and low income households as they are mostly excluded from most financial services. Unfortunately, agro-based enterprises face the same demise. Farmers requiring credit are usually classified as financially ineligible because of the risk that is associated with the sector. Most financial institutions shy away from giving loans to farmers since the success of most agricultural businesses is dependent on uncontrollable elements like rainfall.

Risk and Uncertainty Theory

Risk is defined as a potential loss and it involves exposure to loss or danger. It can also be described as an unplanned event which occurs and can jeopardize a project. Risk can also mean potential threats whose probability of occurrence may be known. Uncertainty, on the other hand, can be explained as a situation where the outcomes of a project are completely unknown (Luhmann, 2017). Agriculture is characterized by uncertainties and risks which in most cases can lead to losses. Compared to other commercial businesses, farming is exposed to many threats that may hinder its success. Agriculture is prone to losses through fire, theft and minimal or excess rainfall which are very uncontrollable elements.

Due to these risks and uncertainties, financial institutions are very skeptical about lending loans to farmers. Due to the unpredictability of farming enterprises, farmers might fail to get any produce and hence default on their loan payments which makes financiers demand collateral specifically from them, making it even more challenging to access credit.

FACTORS INFLUENCING ACCESS TO AGRICULTURAL CREDIT

Farmer's Management Skills and Competencies

Managerial skills have been known to enable individuals to manage a business competently by being able to process relevant information and appropriately adapting to changes in the market environment. These skills and competencies depend mainly on the farmer's level of education and any other form of training on dairy management. However, most small-scale farmers practice agriculture with neither any education-based knowledge nor skills and competencies that may have been acquired through training (Onyango & Kunyanga, 2018)

Collateral Availability

Collateral is issued to guarantee that the borrower does not default on their loan payments. When there is a default in payment, the lender gets a fallback and can dispose of the asset to recover their money (Manvatkar & Babu, 2016). Formal lenders, especially commercial banks, require collateral to secure loans since this lowers the risk of default among borrowers. Most small scale farmers lack properties which they can offer as collateral so as to secure a loan.

Interest Rates On Credit

Commercial lenders require borrowers to pay certain amounts in exchange for the loans or credits issued to them over a certain period of time. These extra amounts charged are known as interest (Turvey & Woodard, 2015). These amounts are considered the cost of credit and the Central Bank determines them autonomously. Other financial institutions price their loans based on the relationship you have with them as a consumer. Interest rates on agricultural credit are decided upon outside the agricultural sector and in most cases end up being too expensive for small-scale farmers to afford.

Empirical Studies

Several studies have been conducted to assess the factors which affect access to credit by small-scale farmers. One of such studies is by (Ladman & Miller, 1983) conducted in Bolivia using a

sample survey which involved 699 randomly selected peasant farmers. To determine the psychological and socio-economic factors which impact credit use among small-scale farmers, the study used discriminate analysis. The study also sought to distinguish non-borrowers from borrowers. The study recognized that borrowers were identified through their educational level, number of cattle, resource base, and their farm size. Non-borrowers were identified with low levels of market integration, long distances from the market, and fewer number of cattle. Non-borrowers, on the other hand, were categorized by lower education levels, shortage of labor, limited use of improved technology among others. Another study by (CD Agom, 2009) investigated the performance of agricultural enterprises in Cross River State in Nigeria are affected by access to credit. The study used the ordinary least square (OLS) multiple regression, discriminative analysis and used simple statistical tools such as ANOVA. The results from the study indicated that loan amount had a positive contribution towards agricultural performance but users failed to use the loans to the optimum.

A study by (Bäckman & Anang, 2016) also explored the factors that affect access to credit by small-scale farmers in Northern Ghana. The study selected 300 small-scale rice farmers from three irrigation schemes using a multi-stage stratified random sampling method. The data collection method used was a semi-structured questionnaire. The study revealed that factors impelling access to agricultural credit in Northern Ghana included; gender, collateral, adoption of modern technology, the location of the farm from lending facilities, cattle ownership among others. The study recommended that extension services to small-scale farmers should be improved to improve their access to micro-credit lending facilities. In Kenya, several studies have also been conducted including, (Nyairo & Njuguna, 2010) who investigated how formal lending conditions affect the supply of agricultural credit. These conditions included; collateral requirements and interest rates. The study adopted a descriptive research design with a target sample population of loan officers and credit managers of banks in Gatundu South. A simple regression model to determine whether collateral requirement and interest rates affected credit access was applied. Recommendations from the study lay an emphasis on public education to show the impact of interest rates on credit. Another study by (Mbugua, 2013) acknowledged that collateral requirements, interest rates charged on loans, and elementary loan requirements affect the access of agricultural credit by farmers.

Another study was conducted on the awareness on access to credit and financial knowledge to informal residents of Nairobi (Mwangi, 2011). The main objective of the study was to assess the impact of financial literacy on access to credit by informal settlements in Nairobi. The study focused on four slums in Nairobi which were; Kibra, Mukuru Kwa Njenga, Korogocho and Mathare. The study used the survey method as the research design and the households willing to participate were sampled at convenience. Data was examined through descriptive statistics and presented in forms of graphs and tables. The study's results indicated that homes in the informal settlements of Nairobi had low literacy levels which largely hindered their access to formal governmental and non-governmental lending institutions.

Majority of the studies that exist on credit have focused on accessibility and impact of credit on farmers in general without narrowing it down to agriculture and especially to SDFs. The nature of these studies show there is a gap in examining the influences of access to credit by SDFs.

MATERIALS AND METHODS

Study area

This study was conducted in Kiambu County, Githunguri Sub-location referred to as ward Number 0577. Githunguri has 3670 hectares and more than half of it is arable making it have very high agricultural potential (COG Kiambu, 2018). Almost two-thirds of the total arable land is occupied by small-scale farmers while the remaining third is occupied by large farms which are mainly coffee or tea plantations. Land in the Sub-location is mainly under freehold tenure. The area receives an average rainfall of 1,200 millimeters. The area is a highland and has very good agricultural soils. Owing to good climate conditions, good soils, most people here are farmers. The economic activity of this area, therefore, revolves around agricultural activities ranging from mixed farming, growing of horticultural crops especially coffee, tea farming, vegetables, maize farming and also small-scale dairy farming. This study targeted small-scale dairy cow farmers in Githunguri Sub-location which approximately has 1,008 small-scale dairy cow farmers (COG Kiambu, 2018), from this a sample of 100 farmers using Cochran formula was chosen but only 81 responded.

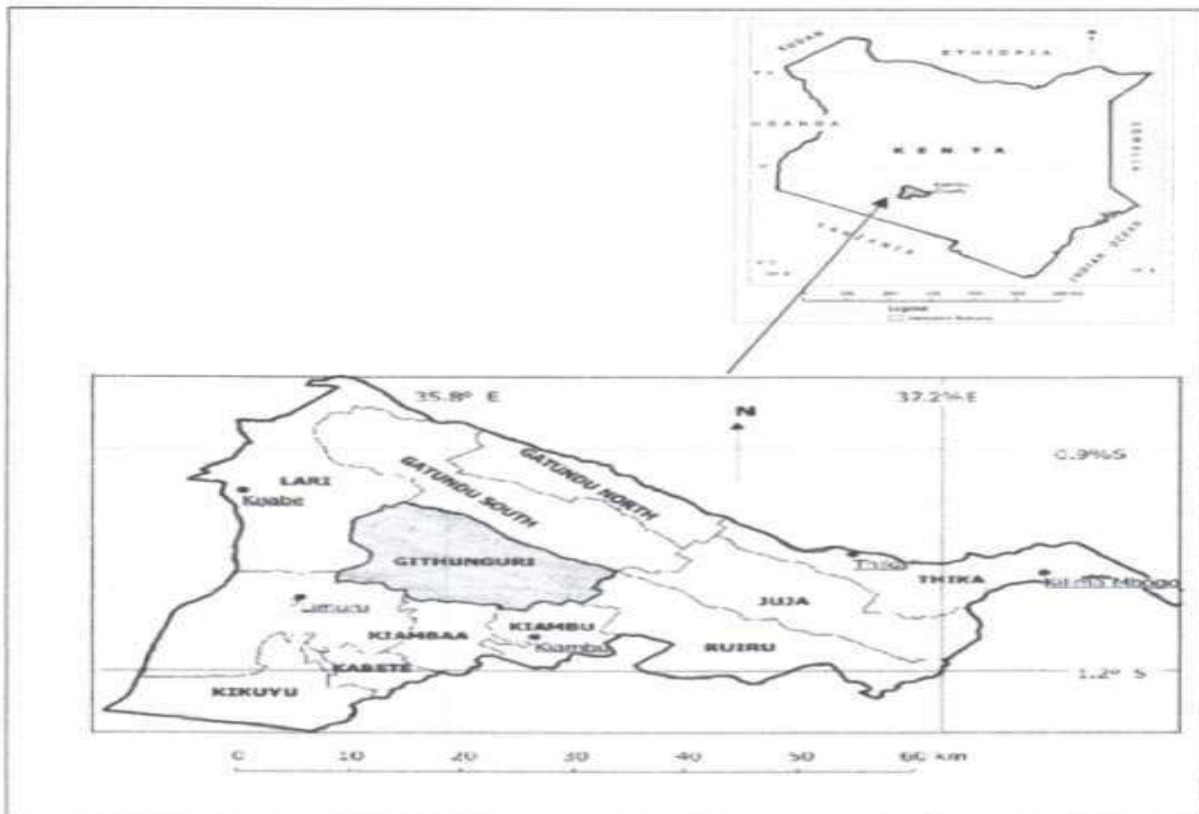


Figure 1: Kiambu Map

Data Collection, analysis and Presentation

Both open-ended and close-ended questions were used to collect both primary and secondary data. Secondary data was got from the local Agricultural Officers and farmers' farm records through face to face interviews. The data analysis process used descriptive statistics. Data analysis was done with the use of SPSS. Study objectives were measured using mean, mode and standard deviation. The multiple linear regression model was used when there are two or more predictor or independent variables. The regression model used was where:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \mu$$

Where:

Y = Access to Agricultural Credit

β_0 = Constant

β_i = Measure how sensitive the dependent variable is to a unit change in independent variables X_1 , X_2 and X_3

X_1 = Farmers' Management Skills and Competencies

X_2 = Collateral Availability

X_3 = Interest charged on Credit

μ = Error term which caters for unexplained variations

DATA ANALYSIS, RESULTS AND DISCUSSION**Demographic Characteristics**

On demographic information the response rate of respondent was 81% out of the 100 questionnaires sent and according to (Kothari, 2004) a response rate that is 50% and above is considered adequate for analysis and hence an 81% response rate was adequate for analysis and reporting. In matters regarding gender, 56% were male and 44% were females, an indication of good representation of both genders in dairy farming activities. This is inline with (Upadhyay & Desai, 2011), who found that women in rural areas play an important role in engaging in small-scale dairy farming. They are equipped with the potential for achieving sustainable improvement and development because of their proactive participation in the farming activities.

With only 4% of the respondents being below 30 years, this study indicated that youths below 30 years are not open to farming. This implied that young individuals have not fully embraced small-scale dairy farming. A study by (Mutua & Bukachi, 2017), points to the fact that the youth are less involved in the dairy sector than the elderly despite agriculture being a leading source of employment. This can mainly be attributed to negative attitude they have towards agriculture because of low returns, white collar jobs preference and limited access to credit (Korir, Afande, & Maina, 2015). Failure of the young people is not good as they are more likely to embrace the modern technology compared to the aged. Furthermore results indicated that majority (45%) of those involved were ages 51 years and above (51-60 (40%) and above 61 years (5%). This implied that most farmers were not very old and had not reached the government retirement age in Kenya which is normally 60 years.

Educational levels of the respondents, showed that 33% had secondary education, 30%, with tertiary education and 12% had no formal education, while the remaining 25% had only gone up to primary school. Majority of the respondents had attained education up to secondary level. The study indicated that most of the respondents from the rural area had access to education because only 12% of the respondents lacked an education background. Education in this study was an important indicator of management skills and competencies of the farmer.

Results on where the respondents got agricultural credit indicated that they farmers got credits from four sources namely; Agricultural Finance Corporation (AFC), Cooperatives, Commercial Banks and Savings and Credit Cooperatives (Sacco). In addition out of 81 respondents, 68 (84%) indicated that they borrowed agricultural credit to finance their activities, implying that credit availability played a vital role in the production practices. Cooperatives had the highest frequency with 28 (41%) out of 68 respondents. The least favored institutions were Commercial Banks with only 12% had borrowed from banks. This was attributed to fact that the banks had higher interest rates compared to Saccos and Cooperatives (Turvey & Woodard, 2015). Farmers also indicated that agricultural credit could not fully cater for their businesses and they therefore had to supplement with their personal savings from loans from friends and families, employment and money from 'chamas' and merry-go-rounds. An average of (57%) of the respondents, favored the informal loans since they were less demanding. The credit providers are shown in Table 1 below.

Table:1 Credit Institutions

| Institution | Frequency | Percentage |
|--------------------|------------------|-------------------|
| AFC | 14 | 21 |
| Commercial Banks | 8 | 12 |
| Cooperatives | 28 | 41 |
| Sacco | 18 | 26 |

When the study sought to determine the influence of the farm management skills and competence of the farmer on access to credit, the result showed that 46% of the farmers, had been practicing dairy farming for less than 5 years, 43% for between 5-15 years and only 22 (27%) out of the 81 farmers had an educational background which they felt had an impact on their farm management skills and competencies. The results further revealed that even without an educational background, 75% of the farmers had received some form of training on dairy farming from various sources. Of these, 57% of all the farmers had received the training from Dairy Cooperatives, 30% from Government Extension Officers, and 13% from NGOs and other institutions and other organizations, mainly personal sources. Farmers were mostly trained on animal husbandry, animal feeds and how to increase dairy milk production. Farmers felt that training increased dairy production and also improved their management skills and competencies.

In evaluating the influence management skills and competence towards access to agricultural credit, the results showed that, 31%, felt that their farm management skills and competencies influenced access to agricultural credit to a very great extent, 26% to great extent, and 26% felt that their management skills did not influence their access to agricultural credit. This implied that

on the overall scale, farm management skills and competencies of the farmers influenced how farmers accessed agricultural credit in Githunguri Sub-location. This agrees with (Manvatkar & Babu, 2016) whose findings noted that the ability to respond efficiently to changing economic conditions is proportional to their resource allocation ability which is linked to their human capital endowment. This implied that the skills of the farmers directly determine their ability to access relevant information, process it, understand and adapt to demand and ultimately manage a business. This analyzed information is tabulated below in table 2 below:

Table 2: Extent of Influence of Management Skills on Access to Agricultural Credit

| | Frequency | Percent |
|-------------------|------------------|----------------|
| No Extent | 21 | 26 |
| Very Great Extent | 25 | 31 |
| Great Extent | 21 | 26 |
| Moderate Extent | 14 | 17 |
| Total | 81 | 100.0 |

Moreover, a study by (Mwangi, 2011) established that the major factor that influences access to small and medium informal businesses in Nairobi, is lack of information that resulted from low literacy levels. The study recommended training for business owners so that they are trained with skills required in running a business. The respondents noted that their management skills were significantly improved through constant training which helped them increase their productivity and keep production records successfully. Training also exposed them to information on accessing agricultural credit and enabled them to efficiently use and manage resources and by extension the credit they borrow. These findings of the study showed that the skills and abilities of the farmers are directly proportional to his performance. This skills influence how he will use the resources available to him like land, information and even knowledge. SDFs should be trained on how to manage their entrepreneurial activities in terms of production, access to information, financial or credit management. Farmers should be imparted with such skills to increase how they manage the resources available to them and in turn increase their potential of accessing agricultural credit facilities.

The study's findings on collateral requirement indicated that from five provided choices (land and title deed, shares in Sacco, shares in Cooperative, machinery, and others) majority of the respondents, 65% (53), owned at least one of the above-named property while 35% (28) owned no form of property. Only 58% (47) of the respondents had at least used any form of property as collateral, which showed that majority of the respondent were required to provide collateral in exchange of agricultural credit. The other 42% indicated that they had never used their property as collateral due to risk of losing the property, low production capacity hence low returns and lack of property to use as collateral. The findings further indicated that 58% of the respondents chose non-formal lenders like self-help groups or friends and families to borrow from because they did not ask for collateral. Results on evaluation of influence of collateral by lenders, indicated that 47 out of 81, influenced to a very great extent, 21 out of 81, to great extent, and 13 to moderate extent. This implied that financiers have adopted a risk-averse attitude towards small borrowers without necessarily evaluating their income generating potential. The findings indicated that 58% of the farmers stated that most lenders were reluctant to avail agricultural credit to them because their activities were not only informal but very risky hence their earnings were unreliable which minimized their likelihood of loan repayments.

A study by (Yehuala, 2008) conducted in Ethiopia established that access to credit is still limited to SDFs. A study of similar nature in Northern Ghana by (Bäckman & Anang, 2016) revealed that collateral, gender and lack of modern technology were the influencing access to credit by SDFs. The results of this study support these studies in Ethiopia and Northern Ghana by indicating that collateral availability by SDFs influenced the accessibility of agricultural credit. The respondents indicated that the assets they owned (especially that of land and machine) influenced their access to agricultural credit lending facilities. Similar study by (Mbugua, 2013) confirmed that collateral availability is stringent in developing countries thus farmers cannot access agricultural credit because most lenders request significant collateral/security before giving loans. Most lenders require borrowers to provide collateral prior to lending as a way of reducing the risk exposure which concurs with the risk and uncertainty theory that states that most financiers will ask for collateral especially from riskier borrowers (Mwega, 2016). The respondent indicated that they preferred to finance their activities using personal savings or other informal lenders like chamas or friends. This was mostly attributed to the informal nature of these loans, the lack of strict requirements like collateral and favorable terms of payment.

On whether the respondent were aware of interest rate was a factor that influenced access to agricultural credit by SDFs, the result indicated, 82% (66) were conscious of the cost of agricultural credit and 52% of them felt that the interest rates were high. Only 18% felt the rates were relative and the remaining 30% described the rates as slightly high. Only 19 out of 81 respondents claimed that interest rates do not influence whether they ask for credit or not while the 72 respondents claimed that interest rates do influence their decisions to ask for a loan. The respondents were asked to what extent interest rates influence their decision to ask for loans. Their responses are tabulated below in table 4.5 as follows:

Table 4.5 Influence of Interest Rates on Agricultural Credit

| | Frequency | Percent |
|-------------------|-----------|--------------|
| No Extent | 19 | 23.5 |
| Very Great Extent | 40 | 49.4 |
| Great Extent | 15 | 18.5 |
| Moderate Extent | 7 | 8.6 |
| Total | 81 | 100.0 |

It was noted that farmers are also skeptical of securing loans with their property to avoid the property being auctioned. Instead of auctioning the property used as collateral in cases of default, they could try refinancing the farmers to be able to get back the money they have already invested in the farming business.

To test for reliability, the study used the Cronbach's Alpha which is a common reliability coefficient that estimates the internal consistency by determining how the different variables relate with each other. Cronbach's Alpha for the study was greater than 0.7 hence the findings of this study are considered consistent and reliable.

Table 4.7 Inter-Item Correlation Matrix

| | Access to Credit | Collateral Requirement | Farm Management Skills | Interest Rates |
|------------------------|------------------|------------------------|------------------------|----------------|
| Access to Credit | 1.000 | .728 | .679 | .384 |
| Collateral Requirement | .728 | 1.000 | .531 | .304 |
| Farm Management Skills | .679 | .531 | 1.000 | .269 |
| Interest Rates | .384 | .304 | .269 | 1.000 |

Regression Analysis

This analysis is done to show how the independent variables influence the dependent variable.

Table 4.1 Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1 | .808 ^a | .652 | .639 | .16995 |

a. Predictors: (Constant), interest rates, collateral requirement, farm management skills

Table 4.8 above is a model fit which determines how the model equation fits the data. The adjusted R^2 (0.639) was used to establish the predictive power of the study model and it implied that 63.9% of the variations on access to agricultural credit among SDFs in Githunguri Sub-County can be explained by farm management skills and competencies of the farmer, collateral requirement and interest rates, leaving 36.1% of the variations unexplained.

Table 4.9 ANOVA Results

| Model | Sum of Squares | df | Mean Square | F | Sig. |
|--------------|----------------|-----------|-------------|--------|-------------------|
| Regression | 4.171 | 3 | 1.390 | 48.134 | .000 ^b |
| Residual | 2.224 | 77 | .029 | | |
| Total | 6.395 | 80 | | | |

a. Dependent Variable: Access to credit

b. Predictors: (Constant), interest rates, collateral requirement, farm management skills

The p-value (0.000) indicated that the regression relationship was significant in determining how farmers' management skills, collateral requirement and interest rates influence access to agricultural credit by SDFs in Githunguri Sub-location. The F value 48.134 is greater than the F critical value 1.390 and therefore the overall model is considered significant.

Table 4.10 Coefficients of Determination

| Model | Unstandardized Coefficients | | Standardized Coefficients | | Sig. |
|-------------------------|-----------------------------|------------|---------------------------|--------|------|
| | B | Std. Error | Beta | T | |
| (Constant) | 0.063 | 0.04 | | 1.592 | .001 |
| Farm Management Skills | 0.265 | 0.039 | 0.286 | 6.991 | .002 |
| Collateral Availability | 0.654 | 0.196 | 0.584 | 3.337 | .000 |
| Interest rates | -0.579 | 0.032 | -0.738 | -18.30 | .000 |

The regression model to be used will be:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \mu$$

Where:

Y = Access to Agricultural Credit

B₀ = Constant

β_i = Measure how sensitive the dependent variable is to a unit change in independent variables X_1 , X_2 and X_3

X_1 = Farmers' Management Skills and Competencies

X_2 = Collateral Availability

X_3 = Interest charged on Credit

μ = Error term which caters for unexplained variations

The resultant regression model was:

$$Y = 0.063 + 0.265X_1 + 0.654X_2 + -0.579X_3 + \mu$$

This indicated that the relationship between farmers' management skills and access to agricultural credit was positive and significant. If all the other factors were held constant, the study revealed that a unit increase in the farmers' management skills would increase access to agricultural credit by 0.265. With all other factors were held constant, a 0.654 increase in the ratings of accessing agricultural credit if there is a unit increase in collateral availability. This also indicated a significant and a positive relationship between access to agricultural credit and the two

independent factors. On the other hand, the relationship between access to agricultural credit and interest rates was significant but negative. This meant that an increase in interest rates by one unit would decrease the scores of accessing agricultural credit by 0.579 while holding other factors constant.

When ANOVA testing was done, the results indicated that the F statistics or Mean Square was 1.390 while the F value was 48.134. The group variables had a p value of 0.000 which is less than 0.005. This showed that the independent variables were statistically significant and influenced access to agricultural credit for SDFs.

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary

This study was based on the realization that although SDFs contributed well over 60% of all the milk that Kenya produces annually, they continue to face problems accessing agricultural credit, which they can use to not only increase their production but to get better storage facilities, reduce spoilage, increase their efficiency and commercialize their activities. With only 4% of the respondents being below the age of 30 years, this study indicated that youths below 30 years have not embraced farming. An average of 40% of the farmers, who engaged in small-scale dairy farming were aged between 51-60 years old while only 5% of the respondents were over 60 years old. Majority of the farmers engaging in small-scale dairy farming had attained education up to secondary level. The respondents who had completely no education were only 12%. Categorized by gender 56% of the respondents were male while 44% of those practicing small-scale dairy farming were female gender. On overall in Githunguri Sub-location, the farmers' management skills, collateral availability and interest rates had an influence on access to agricultural credit for SDFs up to 63.9% while only 36.1% was explained by other factors which were excluded from the model. Regression analysis revealed that there was a significant and positive relationship between farmers' management skills, collateral availability and access to agricultural credit by SDFs in Githunguri Sub-location. This calls for increased extension and training services to increase farmers' managerial skills and competencies which will not only improve the overall management of their activities but will also increase financial awareness and consequently trigger credit uptake which will improve their performance. The analysis also revealed a significant but negative relationship between interest charged on credit and access to agricultural credit, which indicated that lending institutions need to evaluate their lending policies so as to encourage more SDFs to borrow agricultural credit.

CONCLUSION

From the findings, the study concludes that the farmers' management skills and competencies, collateral availability and interest rates had an influence on the access to agricultural credit by SDFs in Githunguri Sub-location and hence need for increased extension and training services to increase farmers' managerial skills and competencies which will not only improve the overall management of their activities but will also increase financial awareness and consequently trigger credit uptake which will improve their performance. Extension services for SDFs can be increased

by the government, who should increase the number of training activities that the government extension officers hold annually for these farmers.

Most lenders require borrowers to provide collateral prior to lending as a way of minimizing the level of risk exposure. Financial lenders can also opt to use alternative lending methods based on the risk level and creditworthiness of borrowers. The findings also draw the conclusion that interest rates administered to SDFs by lenders should be considered. Although the interest rates charged by most lending institutions like commercial banks are regulated, farmers still prefer to borrow from informal lenders like friends and family and 'chamas' because of the favorable terms of payment. Although there is an inverse relationship between interest charged and access to agricultural credit, the pros and cons of charging lower interest rates on economic development should be evaluated. Small-scale dairy farming is unarguably as risky as any farming business, charging higher interest rates not only discourages farmers from borrowing agricultural credit but they also burden farmers with huge amounts they need to pay and increases the number of defaults among farmers.

Recommendations

Based on the research findings and conclusions, the study suggests that the government with the help of other institutions like the NGOs should increase the number of trainings they provide for the SDFs. Management trainings for farmers will enhance their knowledge and skills hence improve their chances of accessing agricultural credit. Moreover the government should try and diversify the trainings so that they are able to cover other pertinent issues requires for successful dairy farming other than trainings on farm management and animal husbandry. Additional trainings to cover credit or financial management, preparation of business plans awareness on where to get affordable agricultural credit need to be enhanced to benefit the farmers. There is a need to seek alternative forms of securing agricultural credit to accommodate farmers who lack property that can be used as collateral. Group lending to farmers in self-help groups be encouraged as it SDF an advantage of economies and Government get involved through formulation of favourable policies that will ensure interests charged to the SDF are not exploitive.

Suggestions for Further Studies

The research covered the factors that influence access to agricultural credit by SDFs in Githunguri Sub-location and the study can be used as a base for more research on the issue of financial constraints that are faced in the dairy industry. Other studies can also be conducted to determine how the dairy sector is improved and developed by the financial sector. Further studies can also be conducted to investigate how the productivity of SDFs is influenced by agricultural credit and to investigate whether there is a link between credit and production.

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