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The Influence of Financial Record Keeping on Small Scale Farmers Profitability: A Case of Kilolo District Council

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ABSTRACT
This paper assessed the Influence of Financial Records Keeping on Small Scale Farmers' Profitability from Kilolo District. Specifically, the study assessed the influence of frequency of record-keeping; number of financial records kept, and financial literacy training on the financial record-keeping practices on profitability of small-scale farmers. A quantitative research approach and cross-sectional design were used. Multiple regression model was used in data analysis. The population of the study was all small scale farmers in four wards namely; Kising'a; Ukwega; Isagwa and Lulanzi of the Kilolo district. Data were collected from the optimal sample size of 165 mall scale maize and beans farmers. Findings for the first objective showed that, 36.8% of the farmers keep financial records while the remaining 63.2% do not keep financial records. More results showed that, farmers who keep financial records likely have a more organized approach to managing their finances. Also, the finding show that, frequency of record-keeping is significant at 1% (p-value =0.000) and a one-unit increase in the frequency of record-keeping is associated with an increase of approximately 10% profitability. Also, number of financial records kept was found significant at 5% (p_value =0.02), one-unit increase in the number of financial records kept is associated with an increase of approximately 19.2% profitability. Finding on financial literacy training shows a significant at 1% (p_value =0.002), holding other variables constant, a one-unit increase in financial training is associated with an increase of approximately 9.5% profitability. The study concludes that, financial training, number of financial record kept and frequency of record-keeping positively associated with the profitability of small-scale farmers. By maintaining more regular and systematic financial records, these farmers are able to enhance their understanding of their financial operations, leading to more informed decisions that ultimately contribute to increased profitability. The study recommends further study in more crops other than maize and bean in Kilolo district. The study was limited by using cross-sectional research design therefore; Panel research is proposed to allow researchers to capture changes and trends in financial record-keeping practices and their effect on profitability over time.

Key words: *Financial Records Keeping; Small Scale Farmers; Profitability; Financial Literacy Training*

1.1 Introduction

Financial record keeping is an essential aspect of managing a business, together with small scale farming. Small scale farmers are individuals who operate on a small scale and depend on their farm produce as their primary source of income (Fanta et al., 2018). Keeping accurate and timely financial records is crucial for small scale farmers to understand their financial position, make informed decisions, and access financial services. The adoption of financial record keeping by small scale farmers has been found to positively affect their performance, productivity, profitability and flexibility (Bhunu, 2021; Fanta et al., 2018; Kizito et al., 2019).

The importance of financial record keeping for small scale farmers is recognized globally. In developing countries, small scale farmers make up a significant portion of the agricultural workforce and contribute much to the economy. For example, in Africa, small scale farmers account for 75% of the total agricultural workforce and produce 90% of the continent's food (Kizito et al., 2019). In Asia, small scale farmers are responsible for producing over 80% of the region's food (IFAD, 2020). The United Nations Sustainable Development Goals (SDGs) also recognize the importance of small scale farmers and aim to improve their productivity, income, and livelihoods by 2030 (UN, 2020).

In the United States, small farms account for approximately 90% of all farms and operate on less than 50 acres of land (USDA, 2019). Similarly, in Europe, small scale farmers make up a significant portion of the agricultural workforce, with over 70% of all farms being less than 5 hectares in size (Eurostat, 2020). Despite the importance of small scale farmers in the agricultural sector, they face various challenges, including limited access to finance, low productivity, and inadequate information management (Kizito et al., 2019). Financial record keeping is crucial for small scale farmers to monitor and evaluate their financial position, make informed decisions, and access financial services.

The extent of financial records keeping among small scale farmers in East Africa nations is low. For instance, in Kenya, a study by Ayieko et al. (2020) found that about 57% of small scale maize farmers kept financial records, while 43% did not keep any records. Similarly, a study by Gebrehiwot and Belay (2020) in Ethiopia found that only 29.8% of small scale farmers kept financial records. In Tanzania, a study by Bank of Tanzania (2018) found that only about 20% of small scale farmers kept financial records. Similarly, a study by Tusiime et al. (2018) in Uganda found that only about 28% of small scale farmers kept financial records. The low levels of financial records keeping among small scale farmers in East Africa can be attributed to various factors, including low levels of financial literacy, lack of access to financial services, and limited awareness of the benefits of financial records keeping (Bank of Tanzania, 2018; Tusiime et al., 2018). However, efforts are being made to improve financial records keeping among small scale farmers in the region. For instance, the Kenya Agricultural and Livestock Research Organization (KALRO) have developed a mobile-based financial management system to help small scale farmers keep financial records and access credit (Ayieko et al., 2020). Additionally, various NGOs and government agencies have been providing training and education on financial literacy and record keeping to small scale farmers in the region (Bank of Tanzania, 2018; Tusiime et al., 2018).

The low level of financial record keeping among farmers leads to various challenges. In West Africa, small scale farmers play a vital role in the agricultural sector and contribute significantly to the economy (Ouédraogo et al., 2019). However, they face numerous difficulties. First, small

scale farmers often lack access to formal financial services, such as credit and savings, which can limit their ability to invest in their farms and improve their productivity (World Bank, 2019). Second, small scale farmers often face limited market access, which can lead to low prices and reduced profitability. They may also struggle to access information on market prices and demand (Haggblade et al., 2019). Third, poor transportation networks and limited access to storage facilities can lead to high post-harvest losses and reduced profitability for small scale farmers (Reardon et al., 2014).

In East Africa, small scale farmers make up important portion of the agricultural workforce, accounting for over 70% of the total workforce in countries such as Uganda, Kenya, and Rwanda (IFAD, 2020). Small scale farmers in East Africa also face challenges similar to those faced in West Africa. Climate change, including droughts, floods, and pests and diseases affect crop yields and reduce profitability (FAO, 2020). Inadequate access to quality inputs such as seeds, fertilizers, and pesticides also reduce yields and limit profitability (Alene et al., 2018). Additionally, small scale farmers face challenges with land tenure, including insecure land rights and conflicts over land use, which limits their ability to invest in farms and improve their productivity (Chamberlin & Jayne, 2013).

In Tanzania, small scale farmers account for approximately 75% of the total agricultural workforce and contribute significantly to the economy (IFAD, 2020). They often lack access to formal financial services and struggle to access credit and savings (Mukashema & Bulte, 2017). Market access is also a challenge for small scale farmers, particularly in rural areas (IFPRI, 2019). Additionally, limited technical skills and knowledge among small scale farmers limits the ability to adopt new technologies and best practices, which could improve their productivity and profitability (Bashir et al., 2020).

Despite the importance of financial record keeping for small scale farmers, studies have shown that many small scale farmers lack the knowledge, skills, and resources required to implement effective financial record keeping practices (Kizito et al., 2019). Therefore, there is a need for more research to understand the effects of financial record keeping on small scale farmers' profitability and recommend effective strategies for promoting its adoption.

Financial record-keeping practices can play a crucial role in improving small scale farmers' profitability and productivity, as well as their ability to adapt to changing economic conditions. According to a study by the Food and Agriculture Organization of the United Nations, proper financial record-keeping practices among small scale farmers can enhance their decision-making processes, improve their access to credit and other financial services, and enable them invest in their farms and households (FAO, 2020).

Small scale farmers located in Kilolo District, Iringa, face numerous challenges that limit their profitability and productivity. One such challenge is poor financial records keeping, which leads to inefficiencies, losses, and missed opportunities for growth and investment. According to a study by the International Fund for Agricultural Development, small scale farmers in developing countries who keep proper financial records tend to have higher productivity, income, and flexible to economic shocks than those who do not (IFAD, 2016).

Despite the importance of financial records keeping for small scale farmers, there is limited research on the effect of this practice on profitability in Kilolo District. Moreover there is lack of understanding on the effect that poor financial management can have on small scale farmers. In

fact according to the World Bank, small scale farmers in developing countries who do not keep proper financial records are at risk of losing up to 25% of their income each year (World Bank, 2019).

Poor financial record-keeping practices among small scale farmers in Kilolo District have negative effect on their economic wellbeing. According to a study by the United Nations Development Programme, small scale farmers in Tanzania who do not keep proper financial records are more likely to experience income losses, financial distress, and difficulties in accessing credit and other financial services (UNDP, 2019). These challenges create a vicious cycle of poverty and underdevelopment, further hindering small scale farmers' potential to grow and succeed. This observation highlighted the potential effect of poor financial record-keeping practices on small scale farmers in Kilolo District and emphasized the need for research to investigate the effects of financial record-keeping on their profitability. Since there was inadequate research done on this topic in Kilolo district, it was crucial to investigate the influence of financial record-keeping practices on small scale farmers' profitability in the District in order to identify areas for improvement and ensure sustainable livelihoods.

2.1 Literature Review

Information asymmetry theory, also known as information economics, is a theory of economics that was established by George Akerlof, Michael Spence, and Joseph Stiglitz in the 1970s. This theory explains how information asymmetry affects economic transactions and market outcomes (Akerlof, 1970; Spence, 1973; Stiglitz, 1975). The main assumption of the information asymmetry theory is that there is unequal distribution of information between buyers and sellers in a market. The seller typically has more information about the product or service being sold than the buyer does. This creates a potential for market failure because the buyer cannot fully evaluate the product's quality, and the seller may take advantage of this information asymmetry (Akerlof, 1970; Spence, 1973; Stiglitz, 1975).

To mitigate this problem, the information asymmetry theory suggests that various mechanisms can be used to reduce the information asymmetry between the buyer and seller. These mechanisms include warranties, signaling, screening, and reputation. Through these mechanisms, the seller can convey information about the quality of the product or service being sold to the buyer, reducing the potential for market failure (Akerlof, 1970; Spence, 1973; Stiglitz, 1975).

One of the strengths of the information asymmetry theory is that, it provides a useful framework for understanding how markets function and why they sometimes fail. It also provides insights into how market outcomes can be improved by reducing information asymmetry through the use of various mechanisms. However, the theory also has some weaknesses. For example, it assumes that all buyers and sellers act rationally and that all information is fully disclosed. In reality, buyers and sellers may not always act rationally, and some information may be intentionally concealed or unavailable.

The information asymmetry theory provides a useful framework for understanding the relationship between financial record keeping and small scale farmers' profitability in Kilolo District. Financial record keeping can be seen as a way of reducing information asymmetry between farmers and stakeholders, thus improving market outcomes. According to the information asymmetry theory, there is a potential for market failure when one party has more information than

the other party in a transaction. In the context of small scale farmers in Kilolo district, this could mean that farmers may not have all the information they need to make informed decisions regarding resource allocation and investment, which could negatively impact their profitability.

Financial record keeping can help mitigate this problem by providing farmers with the information they need to make more informed decisions. For example, farmers who keep financial records are better able to track their expenses, revenues, and profits, which can help them to identify profitable farming activities and make informed decisions regarding resource allocation and investment.

Several studies have examined the relationship between financial record keeping and small scale farmers' profitability in developing countries, including Tanzania. For example, a study by Kangalawe and Lyimo (2017) in Tanzania found that financial record keeping positively affected farmers' income and profitability. The study suggests that farmers who kept financial records were more likely to engage in profitable farming activities and make informed decisions regarding resource allocation. Further, Kaale and Rubanza (2016) in Tanzania found that farmers who kept financial records were able to better manage their resources and make more informed decisions regarding investment and diversification. The study suggests that financial record keeping can help reduce information asymmetry between farmers and stakeholders, thus improving market outcomes.

General, the information asymmetry theory provides a useful framework for understanding the relationship between financial record keeping and small scale farmers' profitability in district. By recognizing the potential of information asymmetry and market failure, stakeholders can promote financial record keeping as a way of reducing information asymmetry and improving market outcomes.

2.2 Empirical Literature Review

2.2.1 Frequency of Record-Keeping and Profitability among Small scale Farmers

Kariuki et al (2018) studied on “the Influence of Record Keeping on the Financial Performance of Small scale Farmers in Nyeri County, Kenya”. The researchers used primary data collected from 120 small scale farmers in 2017 at Nyeri County. The study analyzed the data using descriptive statistics. The findings revealed that farmers who kept records on a weekly or monthly basis had significantly higher profits than those who kept records less frequently. The study recommended that small scale farmers should be encouraged to keep regular financial records to improve their financial performance.

Kironde et al (2017) studied on “The Impact of Record Keeping on Financial Performance of Small Scale Farmers in Iringa Region” in Tanzania. Their study used data of 2016 that were collected from 200 small scale farmers in Iringa Region. The study employed regression analysis to analyze the data. The findings showed that frequent record-keeping among small scale farmers led to improved financial management and increased yields. The study recommended that small scale farmers should be encouraged to keep regular financial records to improve their agricultural productivity.

Falola et al (2019) studied on “The Effects of Record-keeping Frequency on the Productivity of Small Scale Farmers in Kwara State” in Nigeria. Their study used data of the year 2018 that collected from 300 small scale farmers in Kwara State. The study analyzed the data using

descriptive statistics and regression analysis. The findings revealed that small scale farmers who kept records on a daily basis had significantly higher yields than those who kept records less frequently. The study recommended that small scale farmers should be encouraged to keep regular financial records to improve their agricultural productivity.

Kiggundu and Otim (2018) studied on "The relationship of Financial Record Keeping and Small Scale Farmers' Access to Credit in Lira District" in Uganda. Their study used data collected from 400 small scale farmers in Lira District. The study employed regression analysis to analyze the data. The findings showed that frequent record-keeping among small scale farmers led to increased access to credit and improved agricultural productivity. The study recommended that small scale farmers should be encouraged to keep regular financial records to improve their creditworthiness and access to financial services.

Ntow and Donkoh (2012) studied on "The Effect of Financial Record-Keeping on Access to Credit and Productivity of Small Scale Farmers in Ejura-Sekyedumase District in Ghana". Their study used data of the year 2011. The data collected from 300 small scale farmers in the Ejura-Sekyedumase District. The study analyzed the data using descriptive statistics and regression analysis. The findings revealed that increased frequency of financial record-keeping among small scale farmers led to improved access to credit and increased productivity. The study recommended that small scale farmers should be encouraged to keep regular financial records to improve their access to credit and financial performance.

Mwebesa (2018) studied on "Determining the Effects of Financial Record Keeping on Financial Performance of Development Groups in Rubirizi, kasese and Rukungiri" in Western Uganda. The study used data of the year 2018. Data were collected from the total of 103 respondents in the rural districts of Rubirizi, kasese and Rukungiri in western Uganda. The study analyzed the data using descriptive statistics and regression analysis. The findings revealed that financial record keeping contributed greatly to the performance of development groups.

Beatha, (2020) studied on "Financial Record Keeping Practices in Micro and Small Businesses in Tanzania". The study investigated financial record keeping practices in MSBs in Iringa and Kinondoni Municipalities employing a sample of 245 owner managers. Data used was of the year 2020 and were collected using a questionnaire. The study was analyzed the data using descriptive statistics and regression analysis. Findings indicated that financial record keeping in MSBs remains a big challenge. Some MSBs occasionally kept records while others did not keep records at all. The most kept records were inventories and purchases rather than sales. Recommendation on the study was to provide knowledge on the value of record keeping, improve skills, provision of funds to hire skilled personnel and of facilities such as tables/desks and cabinets to store records.

Demissie et al (2021) studied on Effect of Financial Record Keeping on Agricultural Productivity of Small Scale Farmers; A Case of Jeldu District" Ethiopia. Their study used data collected in 2020 from 384 small scale farmers in the Jeldu District. The study employed regression analysis to analyze the data. The findings showed that frequent record-keeping among small scale farmers led to improved financial management and increased agricultural productivity. The study recommended that small scale farmers should be encouraged to keep regular financial records to improve their financial performance and agricultural productivity.

2.2.2 Number of Financial Records kept and Profitability of Small scale Farmers

Agyekum et al (2019) studied on "Effect of Financial Record Keeping on Small Scale Farmers' Productivity in Atwima Mponua District" in Ghana using data collected in 2018 from 150 small scale farmers. The study used a cross-sectional survey design and analyzed the data using descriptive statistics and regression analysis. The findings revealed that completeness of financial records had a significant positive effect on small scale farmers' agricultural productivity. The study recommended that small scale farmers should be encouraged to keep complete financial records to improve their financial performance.

Ngowi and Masanja (2017) studied on "Completeness of Financial Records and Its Implications on Access to Credit and Performance of Small Scale Farmers" in Tanzania. Their study used data of 2015 collected from 100 small scale farmers in Kilolo District. The study employed a survey research design and analyzed the data using descriptive statistics. The findings showed that completeness of financial records had a significant positive effect on small scale farmers' access to credit and agricultural productivity. The study recommended that small scale farmers should be encouraged to keep complete financial records to improve their access to credit and financial performance.

Aliyu et al (2020), studied on "The Effect of Completeness of Financial Records on the Profitability and Credit Access of Small Scale Farmers in Kano State" in Nigeria. Their investigation used data of the year 2019 collected from 200 small scale farmers in Kano State. The study used a cross-sectional survey design and analyzed the data using descriptive statistics and regression analysis. The findings revealed that completeness of financial records had a significant positive effect on small scale farmers' profitability and access to credit. The study recommended that small scale farmers should be encouraged to keep complete financial records to improve their financial performance.

Mwangi and Njagi (2019) studied on "The Influence of Financial Record Keeping on Small Scale Farmers' Access to Credit and Productivity in Murang'a County" in Kenya. Their study used data of 2018 collected from 120 small scale farmers in Murang'a County. The study employed a survey research design and analyzed the data using descriptive statistics and regression analysis. The findings revealed that completeness of financial records had a significant positive effect on small scale farmers' access to credit and agricultural productivity. The study recommended that small scale farmers should be encouraged to keep complete financial records to improve their access to credit and financial performance.

Madafu, 2015 studied on "Influence of access to bank credit on the performance of small scale farmers in Mvomero Districts in Tanzania. The researchers used data in 2015 that collected from 162 small scale farmers in Mvomero District. Both qualitative and quantitative research approaches were utilized in the study and employed descriptive statistics to analyze the data. The findings revealed that the value of assets invested in farming activities and education were significant factors affecting smallholder farmers‟ access to bank credit and; lack of collaterals, vital bank information, proximity to banks and high interest rates were some among the major obstacles hindering smallholder farmers‟ accessibility to bank credit. Further, access to bank credit was found to have a significant influence on the performance of smallholder farmers as it influenced both output and increase in annual returns.

Mlay et al (2018), studied on "The Effect of Completeness of Financial Records on Financial Performance of Small Scale Farmers; A Case of Mbarali District" in Tanzania. The researchers used data in 2017 that collected from 200 small scale farmers in Mbarali District. The study employed descriptive statistics and regression analysis to analyze the data. The findings showed that completeness of financial records significantly influenced the financial performance of small scale farmers. The study recommended that small scale farmers should be encouraged to keep complete financial records to improve their financial performance.

Kanyingi and Obere (2019) studied on "Influence of Completeness of Financial Records on the Financial Performance of Small Scale Farmers in Meru County" in Kenya. Their study used data of 2018 which collected from 100 small scale farmers in Meru County. The study employed regression analysis to analyze the data. The findings showed that completeness of financial records significantly influenced the financial performance of small scale farmers. The study recommended that small scale farmers should be encouraged to keep complete financial records to improve their financial performance.

Agyei et al (2015) studied on "The Effect of Completeness of Financial Records on Financial Performance of Small Scale Farmers in Ejura-Sekyedumase District" in Ghana. Their study used data collected in 2014 from 200 small scale farmers in the Ejura-Sekyedumase District. The study employed regression analysis to analyze the data. The findings showed that completeness of financial records significantly influenced the financial performance of small scale farmers. The study recommended that small scale farmers should be encouraged to keep complete financial records to improve their financial performance.

Okeke and Urama (2016) studied on "The Influence of Completeness of Financial Record Keeping to the Performance of Small Scale Farmers in Enugu District" in Nigeria. The study used data collected in 2016 from 300 small scale farmers in Enugu State. The study employed descriptive statistics and regression analysis to analyze the data. The findings showed that completeness of financial records significantly influenced the financial performance of small scale farmers. The study recommended that small scale farmers should be encouraged to keep complete financial records to improve their financial performance.

2.2.3 Financial Literacy Training of Financial Record-Keeping and Profitability

Kasasa et al (2018) studied on "The Impact of Financial Literacy Training on Financial Record-keeping Practices and Agricultural Productivity among Small Scale Farmers in Uganda". Their study used primary data of 2018 collected from 150 small scale farmers. The study employed a randomized controlled trial design to evaluate the impact of financial literacy training on financial record-keeping practices and agricultural productivity. The findings showed that the farmers who received financial literacy training had significantly better financial record-keeping practices and higher agricultural productivity than those in the control group. The study recommended that financial literacy training programs should be incorporated into small scale farmer support programs to improve financial record-keeping practices.

Kariuki and Ngugi (2019) studied on "The Influence of Record-Keeping on the Financial Performance of Small Scale Farmers in Nyeri County" in Kenya. Their investigation used primary data collected from 200 small scale farmers in Nyeri County in 2018. The study employed a pre-test post-test experimental design to evaluate the impact of financial literacy training on financial record-keeping practices and profitability. The findings showed that the farmers who received

financial literacy training had significantly better financial record-keeping practices and higher profitability than those in the control group. The study recommended that financial literacy training should be provided to small scale farmers to improve their financial record-keeping practices and profitability.

Tesfaye and Assefa (2018) studied on "The computer-based financial record-keeping and performance of small Scale farmers; A Case of Amhara region" in Ethiopia. They used primary data of 2017 collected from 250 small scale farmers in the Amhara region. The study employed a quasi-experimental design to evaluate the impact of financial literacy training on financial record-keeping practices and access to credit. The findings showed that the farmers who received financial literacy training had significantly better financial record-keeping practices and greater access to credit than those in the control group. The study recommended that financial literacy training should be provided to small scale farmers to improve their financial record-keeping practices and access to credit.

Kifaro and Kappel (2015) studied on "The Impact of Financial Literacy Training on Financial Record-keeping Practices and Income of Small Scale Farmers in Morogoro region" in Tanzania. Their study used primary data collected in 2014 from 300 small scale farmers in Morogoro region. The study employed a randomized controlled trial design to evaluate the impact of financial literacy training on financial record-keeping practices and income. The findings showed that the farmers who received financial literacy training had significantly better financial record-keeping practices and higher income than those in the control group. The study recommended that financial literacy training should be provided to small scale farmers to improve their financial record-keeping practices and income.

Stephen et al. (2022). Studied on "The effects of financial literacy on financial inclusion; A case of Rungwe-Mbeya, Tanzania. Data used were of the year 2022 with a sample size of 400 respondents. Data from the sample frame were obtained using questionnaire. The collected data were subjected for pilot survey, cleaning, factor analysis, reliability and validity testing. Data analysis used structural equation modeling (SEM). From the analysis it was found that effective sourcing, efficient allocation of financial resources and proper projections of financial risks literacy capabilities had a positive and significant effect on sustaining financial inclusion. Thus, it is from these impressing results revealed this study recommend to financial needy customers being acquainted with necessary financial management skills for realization of financial inclusion. Financial user customers should acquire appropriate trainings for them efficiently allocate the acquired financial resources. On the other hand, financial institutions should invest on training and if not, enough the financial credit counseling centers are to be installed just near homes of customers.

Abdulai and Owusu (2018) studied on "The Impact of Financial Literacy Training on Financial Record-keeping Practices and Access to Credit among Small Scale Farmers in the Upper East region" in Ghana. Their study used primary data collected from 200 small scale farmers in the Upper East region. The primary data collected in 2017. The study employed a quasi-experimental design to evaluate the impact of financial literacy training on financial record-keeping practices and access to credit. The findings showed that the farmers who received financial literacy training had significantly better financial record-keeping practices and greater access to credit than those

in the control group. The study recommended that financial literacy training should be provided to small scale farmers to improve their financial record-keeping practices and access to credit.

Adesope et al (2020) studied on "The Impact of Financial Literacy Training on Financial Record-keeping Practices and Agricultural Productivity among Small Scale Farmers in Ogun State" in Nigeria. They used primary data from 150 small scale farmers that collected for the year 2019. The study employed a quasi-experimental design to evaluate the impact of financial literacy training on financial record-keeping practices and agricultural productivity. The findings showed that the farmers who received financial literacy training had significantly better financial record-keeping practices and higher agricultural productivity than those in the control group. The study recommended that financial literacy training should be provided to small scale farmers to improve their financial record-keeping practices and agricultural productivity.

Kalunda E. (2017), studied on "The Impact of Financial Inclusion on Financial Literacy of the Small Scale Tea Farmers in Nyeri County" in Kenya. The study was a survey and descriptive in nature. A sample size of 165 respondents was used. Data used were collected in 2017 through questionnaires. The findings reveal that the level of inclusion is high and usage in terms of credit access is also high. In terms of financial literacy the farmers are not receiving adequate financial education which is a component of financial inclusion. The study recommends that financial counseling and education should be offered to the farmers to enable them to appropriately use the financial products and services offered through financial inclusion initiatives.

Ntawuruhunga et al (2019) studied "The Impact of Financial Literacy Training on Financial Record-keeping Practices and Performance of Small Scale Farmers; Evidence from Rwanda". Their investigation used primary data of 2018 collected from 120 small scale farmers in the Northern Province. The study employed a quasi-experimental design to evaluate the impact of financial literacy training on financial record -keeping practices and performance of small scale farmers. The data were analyzed using descriptive statistics and regression analysis. The findings showed that the financial literacy training had a positive impact on the financial record-keeping practices of small scale farmers, which subsequently led to improved financial performance. The study recommended that small scale farmers should be provided with financial literacy training to improve their financial management skills and overall performance..

3.0 Methods

The study adopted a quantitative research approach and cross-sectional design were used. Multiple regression model was used in data analysis. The population of the study was all small scale farmers in four wards namely; Kising'a; Ukwega; Isagwa and Lulanzi of the Kilolo district. Data were collected from the optimal sample size of 165 mall scale maize and beans farmers.

Quantitative data from questionnaire were analyzed using inferential statistics. Study used multiple linear regression models. In linear regression analysis, the estimates of the regression coefficients (slope or intercept) are obtained using the method of Ordinary Least Squares (OLS) (Gujarati, 2003; Wooldridge, 2015). The OLS method estimates regression coefficients that minimize the sum of the squared differences between the observed values and the predicted values.

3.1 Theoretical Model Specification

i) Econometric Model

The dependent variable is profitability of small scale farmers while independent variables are frequency of record-keeping, completeness of financial records and financial literacy training. The regression model is presented in the following equation.

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

Where: Y is the dependent variable (profitability of small scale farmers), β_0 is the intercept, β_1, β_2& β_3 are the slopes of the regression equation.

X_1 Frequency of record-keeping

X_2 Number of financial records kept

X_3 Financial literacy training

ii) Algebraic Signs of Parameters

The algebraic sign of parameters in a regression model is important for understanding the nature and strength of the relationship between the independent variable(s) and the dependent variable. Exactly, the algebraic sign of the parameter can be used to determine whether the relationship is positive or negative. A positive parameter indicates that there is a positive relationship between the independent variable(s) and the dependent variable. This means that as the value of the independent variable(s) increases, the value of the dependent variable also increases. A negative parameter indicates that there is a negative relationship between the independent variable(s) and the dependent variable. This means that as the value of the independent variable(s) increases, the value of the dependent variable decreases.

A positive slope indicates that the dependent variable increases as the independent variable increases, while a negative slope indicates that the dependent variable decreases as the independent variable increases. Regression model aims to show causality among variables. Also, the magnitude of the parameter is also important for understanding the strength of the relationship between the variables, as a larger magnitude indicates a stronger relationship.;

4.0 Findings and Discussion

4.1 Econometric analysis of data

$Y= f(X_1, X_2, X_3)$

Where Y= Dependent variable (profitability)

X_1=Frequency of financial record keeping

X_2= Number of financial record kept

X_3= Financial literacy training

The model was specified as linear

$Y_i= \alpha_0 +\alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3+U_i$

Where

$\alpha_1 >0$

$\alpha_2 > 0$

$\alpha_3 > 0$

The estimated model is

$\bar{Y} = 14.445+0.1(X_1) +0.192(X_2) +0.095(X_3)$

Where

$X_1=2.372$

$X_2=2.552$

$X_3=2.185$

$\bar{Y}= 15.38$

4.1.1 Model Summary

Table 1 present model summaries that provide information about a linear regression model that was used to predict the dependent variable profitability of small scale farmers based on the independent variables of frequency of record-keeping, completeness of financial records and financial literacy training. The value of adjusted R Square is 0.734, indicating that 73.4% of the variance in the dependent variable is explained by the independent variables (i.e. frequency of record-keeping, completeness of financial records and financial literacy training). A higher Adjusted R-squared of 73.4% indicates that a larger proportion of the variance in the dependent variable is being explained by the independent variables in the model. It suggests a better fit of the model to the data.

Table 1 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.860[a]	.739	.734	.33985

a. Predictors: (Constant), Frequency of record-keeping, number of financial records kept, Financial Training

b. Dependent Variable: ln_profit

4.1.2 ANOVA Table

The table number 2 presents ANOVA table which summarizes the analysis of variance for the regression model. Results of the mean square for the regression model are 17.322 and the mean square for the residuals is 0.115. The F statistic tests the null hypothesis that all the regression coefficients are equal to zero, which means that the independent variables have no significant influence on the dependent variable. The p-value of .000 indicates that the regression model is highly significant and the null hypothesis can be rejected. This implies there is at least one independent variable that statistically significant and influences the profitability of small scale farmers.

Table 2 ANOVA Table

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	51.967	3	17.322	149.982	.000[b]
	Residual	18.364	159	.115		
	Total	70.331	162			

a. Dependent Variable: ln_profit

b. Predictors: (Constant), Frequency of record-keeping, Completeness of financial records, Financial Training

4.1.3 Multicollinearity

Table 3 shows the variance inflation factor (VIF) and tolerance values for the independent variables of frequency of record-keeping, number of financial records kept and financial literacy training. The VIF measures the extent to which the variance of the estimated regression coefficients is inflated due to multicollinearity, which occurs when the independent variables are highly correlated with each other. A VIF of 1 indicates no multicollinearity, while a VIF greater than 5 indicates some degree of multicollinearity. Generally, a VIF value of less than 5 indicates that multicollinearity is not a problem. In this case, the VIF values for frequency of record-keeping, number of financial records kept and financial literacy training are 2.496, 2.312, and 3.559 respectively. These values for three independent variables VIF value less than 5, indicating that there is no severe multicollinearity among the independent variables.

Table 3 Multicollinearity

Variables	Tolerance	VIF
Number of financial records kept	.433	2.312
Financial Training	.281	3.559
Frequency of record-keeping	.401	2.496

4.1.4 Heteroscedasticity

The scatter plot of regression standardized predicted values against regression standardized residuals are a diagnostic tool used to identify potential problems with the linear regression model, particularly the assumptions of linearity and homoscedasticity. The scatter plot shows the standardized residuals on the y-axis and the standardized predicted values on the x-axis. Ideally, the scatter plot should show no pattern, and the residuals should be randomly scattered around zero with a constant spread, indicating that the model is properly specified and the assumptions of linearity and homoscedasticity are met.

Decision criteria revealed, if the scatter plot displays a pattern, for example a curve or a funnel shape, it indicates that the model may be miss specified or there may be a violation of the assumptions of homoscedasticity. Also, if the scatter plot shows a funnel shape, with the spread of the residuals increasing or decreasing as the predicted values increase, it indicates a violation of the assumption of homoscedasticity. This means that the variance of the residuals is not constant

across the range of the independent variables. Figure 4.1 indicate irregular pattern, thus there is no problem of heteroscedasticity. Thus, assumption of homoscedasticity is met and concludes there is variance of residual is constant.

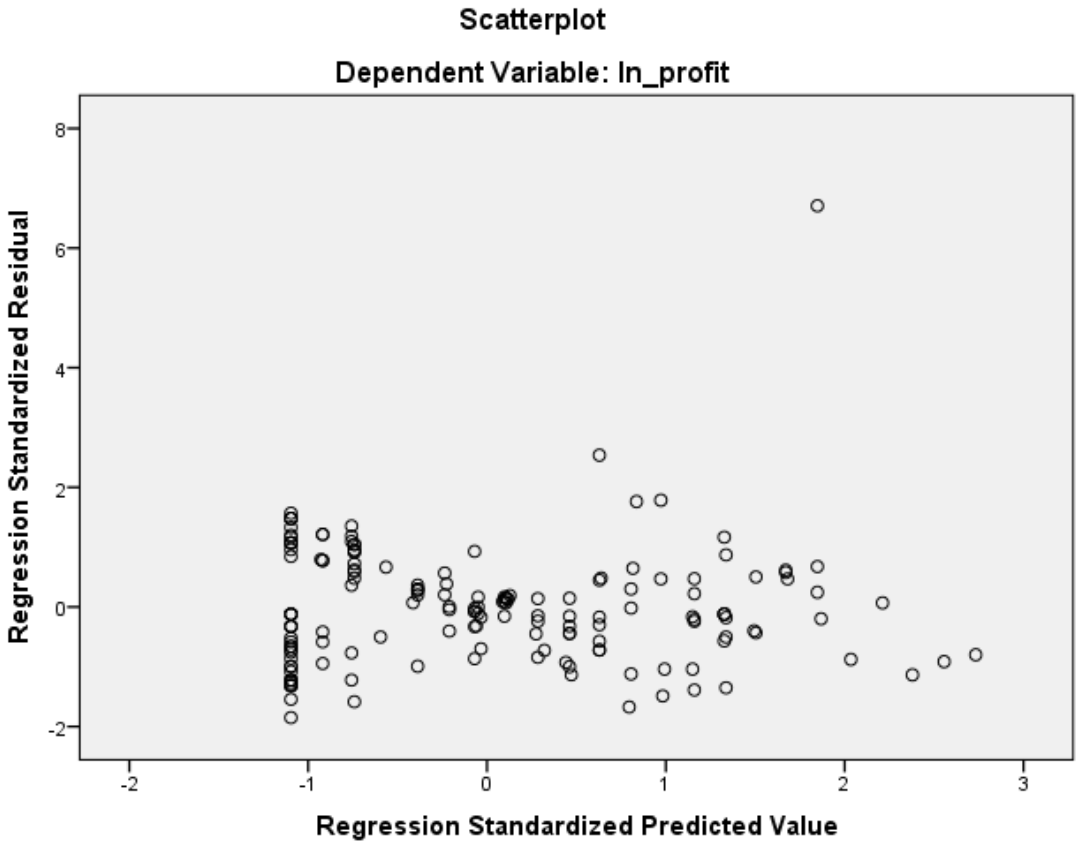

Figure 1: Scatter Plot

4.1.5 Residuals Normality

4.1.5.1 Normal Q-Q plot

Moreover, normal probability plot, also known as the normal q-q plot, is a diagnostic tool used to assess the normality assumption of the residuals in a linear regression model. The normal q-q plot is a scatterplot that compares the observed standardized residuals with the expected values of the corresponding percentiles of a standard normal distribution. If a normal q-q plot that deviates from a straight line indicates that the residuals are not normally distributed. If the plot is skewed or curved, it suggests that the distribution of the residuals deviates from normality. Likewise, if the normal p-p plot shows "S" shape or an "inverted S" shape, it indicates that the residuals are not normally distributed and there may be some nonlinearities in the relationship between the dependent variable and the independent variables. Findings from Figure 4.2 shows the ideal normal q-q plot show the observed residuals closely following a straight line, indicating that the residuals are normally distributed.

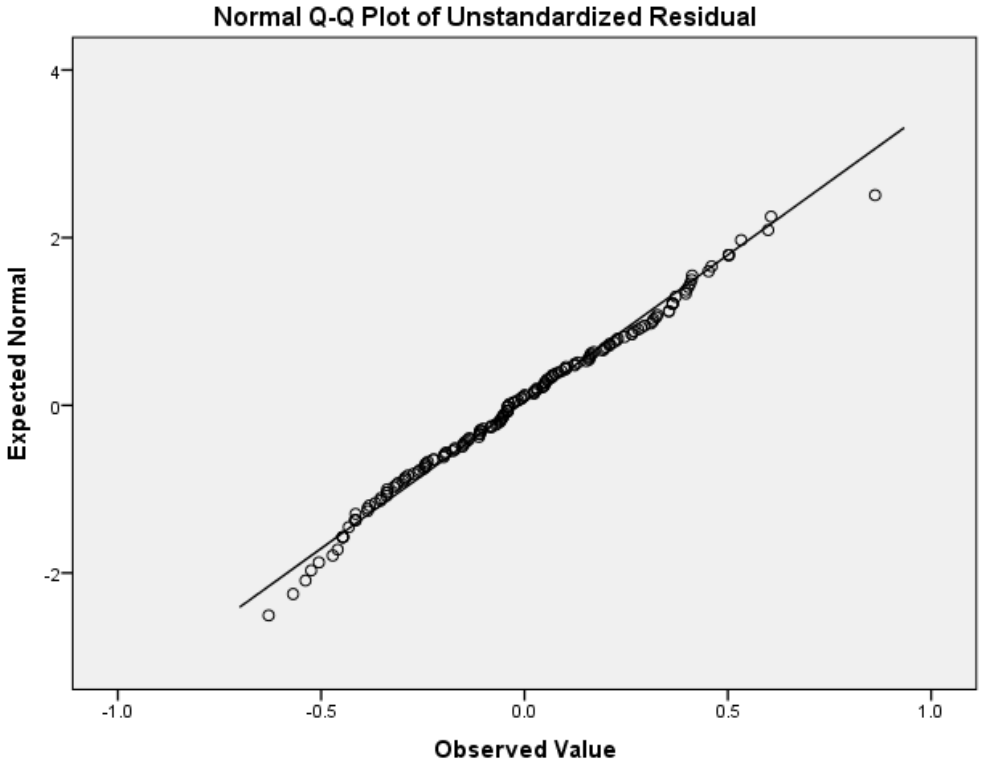

Figure 2: Normal Q-Q plot

4.1.5.2 Test for Normality

Table number 4 shows the results of two normality tests (Kolmogorov-Smirnova and Shapiro-Wilk) conducted on the standardized residuals of the regression model. The results show, the p-value for the Kolmogorov-Smirnova test is 0.200 and the p-value for the Shapiro-Wilk test is 0.239 generally, a p-value greater than 0.05 suggests that the data/residual is normally distributed. However, in this case, the p-values are greater than 0.05, indicating that we cannot reject the null hypothesis of normality at the 5% of significance. Therefore, we can conclude that the standardized residuals of the regression model are normally distributed.

Table 4 ***Test for Normality***

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statisti c	Df	Sig.	Statisti c	Df	Sig.
Standardized Residual	.044	163	.200*	.989	163	.239

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

4.1.5.3 Correlation

Correlation measures the strength and direction of a linear relationship between two variables. Table 5 values range from -1 to 1, with -1 indicating a perfect negative correlation, 1 indicating a perfect positive correlation, and 0 indicating no correlation.

There is negative and moderate correlation among financial training and number of financial records kept of -0.551. There is a moderate negative correlation between financial training and the number of financial records kept. This suggests that as the level of financial training increases, the number of financial records kept tends to decrease. However, the correlation is not very strong, meaning that other factors could also be influencing the number of records.

Likewise results show the correlation coefficient of -0.596 between financial training and frequency of record-keeping. There is a moderate negative correlation between financial training and the frequency of record-keeping. This implies that individuals with higher levels of financial training tend to keep financial records less frequently. Again, this correlation is not extremely strong, specifying that other factors might play a role as well.

There is a weak negative correlation between the number of financial records kept and the frequency of record-keeping of -0.084. This suggests that those who maintain more complete financial records may not necessarily do so more frequently. The correlation is quite weak, indicating that these two factors are not strongly related.

Table 5 Correlation

	Financial Training	Number of financial records kept	Frequency of record-keeping
Financial Training	1.000	-.551	-.596
Number of financial records kept	-.551	1.000	-.084
Frequency of record-keeping	-.596	-.084	1.000

4.2 Regression Findings

The regression co-efficient results show that there is significant correlation between financial records and profitability among small scale farmers in Kilolo district. As shown beta = 0.1, 0.192 and 0.095 (See Table 6).Finding of all three variables from each of specific objective are positive This implies all three variables are positively influence profitability among small scale farmers.

Table 6 Regression Coefficient

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	14.445	.042		341.649	.000
Frequency of record-keeping	.100	.012	.549	2.372	.000
Number of financial records kept	.192	.082	.145	2.552	.020

Financial Training	.095	.030	.243	2.185	.002

a. Dependent variable: In profit

4.2.1 Frequency of Record-Keeping

This section present results of first specific research objective that aim to examine the effects of frequency of record-keeping on profitability among small scale farmers. Result shows the coefficient of 0.100, standardized Coefficient (Beta) of 0.549 and significance (Sig.) of 0.000. Holding other variables constant, a one-unit increase in the frequency of record-keeping is associated with an increase of approximately 0.100 in the natural logarithm of profitability. (Profitability among small scale farmers). The standardized coefficient (Beta) of 0.549 suggests that this variable has a moderate positive effect on profitability (profitability among small scale farmers). The low p-value (Sig. = 0.000) indicates that this effect is statistically significant at 1%. Therefore, frequency of record-keeping positively associated with increase the profitability among small scale farmers.

Therefore, results align with formulated hypothesis and conclude that frequency of record-keeping positively influence the profitability among small scale farmers. Findings are consistent with Kariuki et al (2018) from Kenya investigated the influence of record-keeping on the financial performance of small scale farmers in Nyeri County, Kenya. The findings revealed that farmers who kept records on a weekly or monthly basis had significantly higher profits than those who kept records less frequently. Similarly, Kironde et al (2017) from Tanzania showed that frequent record-keeping among small scale farmers led to improved financial management and increased yields. Likewise, Falola et al (2019) from Kenya also exposed similar results where small scale farmers who kept records on a daily basis had significantly higher yields than those who kept records less frequently. In addition, Kiggundu and Otim (2018) from Uganda revealed similar which showed that frequent record-keeping among small scale farmers led to increased access to credit and improved agricultural productivity. In addition, Ntow and Donkoh (2012) revealed that increased frequency of financial record-keeping among small scale farmers led to improved access to credit and increased productivity.

4.2.2 Number of Financial Records Kept

This section presents the results of third specific objective that aim to examine the influence of completeness of financial records on profitability among small scale farmers. The variable is statistically significant at 5% (p_value =0.020). The variable of completeness of financial records associated with coefficient of 0.192 and standardized coefficient (Beta) of 0.145. Holding other variables constant, a one-unit increase in the completeness of financial records is associated with an increase of approximately 0.192 in the natural logarithm of profitability. The standardized coefficient (Beta) of 0.145 suggests that this variable has a relatively smaller positive impact on profitability compared to the others. The p-value of 0.020 indicates that this effect is statistically significant at 5%.

Consequently, results align with formulated hypothesis and conclude that completeness of financial records positively affect the profitability among small scale farmers. Findings consistence with Agyekum et al (2019) from Ghana where their findings revealed that completeness of financial records had a significant positive effect on small scale farmers'

agricultural productivity. Simialry, Ngowi and Masanja (2017) and Mlay, Nziku, and Malisa (2018), from Tanzania showed that completeness of financial records had a significant positive effect on small scale farmers' access to credit and agricultural productivity. In a study conducted in Nigeria by Aliyu et al (2020), revealed that completeness of financial records had a significant positive effect on small scale farmers' profitability and access to credit.

Findings are consistent with those of Kanyingi and Obere (2019) conducted a study based on influence of completeness of financial records on the financial performance of small scale farmers in Meru county, Kenya. The findings showed that completeness of financial records significantly influenced the financial performance of small scale farmers. In Ghana, Agyei et al (2015) showed that completeness of financial records significantly affected the financial profitability of small scale farmers.

In addition, results are consistent with Information asymmetry theory established by George Akerlof, Michael Spence, and Joseph Stiglitz in the 1970s. This theory explains how information asymmetry affects economic transactions and market outcomes. Financial record keeping can be seen as a way of reducing information asymmetry between farmers and stakeholders, thus improving market outcomes. According to the information asymmetry theory, there is a potential for market failure when one party has more information than the other party in a transaction. In the context of small scale farmers in Kilolo district found at Iringa Region, this could mean that farmers may not have all the information they need to make informed decisions regarding resource allocation and investment, which could negatively affect their profitability.

4.2.3 Financial Literacy Training

This subsection presents the results of last specific objective that aim to evaluate the influence of financial literacy training on the financial record-keeping practices on profitability of small scale farmers. Financial literacy training shows a significant at 1% (p_value =0.002). Finding show that, holding other variables constant, a one-unit increase in financial training is associated with an increase of approximately 0.095 in the natural logarithm of profitability (profitability of small scale farmers). The standardized coefficient (Beta) of 0.243 indicates that this variable has a moderate positive effect on profitability. The p-value (Sig. = 0.002) suggests that this effect is statistically significant.

Consequently, results align with formulated hypothesis and conclude that financial literacy training positively affect the profitability among small scale farmers. Findings align with Kasasa et al (2018) look into the impact of financial literacy training on financial record-keeping practices and agricultural productivity among small scale farmers in Uganda. Their findings showed that the farmers who received financial literacy training had significantly better financial record-keeping practices and higher agricultural productivity than those in the control group. Similarly, results consistence with Kariuki and Ngugi (2019) from Kenya, Tesfaye and Assefa (2018) from Ethiopia, Kifaro and Kappel (2015) from Tanzania. Their findings showed that the farmers who received financial literacy training had significantly better financial record-keeping practices and higher agricultural productivity and income than those in the control group which subsequently led to improved financial performance.

Likewise, results align with human capital theory established by economist Gary Becker in the 1960s. It is an economic theory that explains how individuals and organizations invest in education and training to increase their productivity and overall human capital (Becker, 1962). Training on

improved farming techniques and technologies could increase farmers' human capital, leading to higher productivity and increased income. The theory suggests that investments in education and training can increase individuals' productivity and earnings potential. In the context of small scale farmers in Kilolo district, keeping financial records could be seen as an investment in their human capital. By keeping track of their financial activities, farmers can better understand the profitability of their operations and make informed decisions on how to allocate their resources.

5.0 Conclusion and Recommendation

5.1 Conclusion

Based on the findings from the first objective, it is evident that financial record-keeping practices among small-scale farmers play a crucial role in their overall financial management strategies. The survey revealed that 36.8% of the farmers surveyed indicated that they maintain financial records, while the majority comprising 63.2% does not engage in this practice. The farmers who do engage in financial record-keeping are likely to benefit from a more structured and informed approach to managing their finances. By systematically tracking income, expenses, profits, and losses, these individuals are better positioned to make informed decisions regarding their farming operations.

Analyzing the frequency of record-keeping among the subset of farmers who engage in this practice further reveals interesting insights. A relatively small proportion of respondents (2.5%) keep records on a daily basis, while others choose to update their records weekly (5.5%), monthly (7.4%), quarterly (16.0%), or annually (5.5%). The higher percentage of farmers engaging in quarterly record-keeping could be attributed to the cyclical nature of agricultural activities. Quarterly intervals align with crucial stages such as planting, harvesting, and selling, making it a logical time frame for comprehensive financial tracking.

In accordance with the findings of the second specific research objective, the analysis of the relationship between the frequency of record-keeping and the profitability of small-scale farmers has provided valuable insights. The statistical results underscore a meaningful and positive association between the frequency of record-keeping and the profitability of these farmers. In conclusion, based on the evidence provided by the coefficients and statistical analysis, it is evident that the frequency of record-keeping is a crucial factor positively associated with the profitability of small-scale farmers. By maintaining more regular and systematic financial records, these farmers are able to enhance their understanding of their financial operations, leading to more informed decisions that ultimately contribute to increased profitability. The findings highlight the practical significance of effective record-keeping practices in optimizing the profitability of small-scale farming activities.

The findings from the third specific research objective provide significant insights into the influence of the number of financial records kept on the profitability of small-scale farmers. The statistical analysis has illuminated a noteworthy relationship between these two variables, shedding light on the effect of financial record completeness on overall profitability. In conclusion, the findings underscore the importance of maintaining comprehensive, observed positive relationship between the number of financial records kept and profitability implies that those who accurately document their financial transactions and activities tend to achieve higher levels of profitability.

In conclusion of last objective, the findings affirm the significant role of financial training in enhancing the profitability of small-scale farmers. The observed moderate positive effect suggests that farmers who receive financial training are better equipped to manage their financial aspects effectively, leading to improved profitability. The statistical significance of this relationship further solidifies the notion that investing in financial training can yield tangible benefits for small-scale farmers, ultimately contributing to the sustainability and success of their agricultural enterprises.

5.2 Recommendations for Actions

Based on the findings that emphasize the crucial role of financial record-keeping practices among small-scale farmers, several recommendations are made to enhance their financial management strategies and overall success:

5.2.1 Recommendation for Action

5.2.1.1 Frequency of financial record keeping

First study recommends in promote financial record-keeping education. Since financial record-keeping has been shown to positively affect the financial management of small-scale farmers, it's important to promote education and awareness about the benefits of maintaining accurate records. Agricultural extension programs, workshops, and training sessions could be organized to help farmers understand the significance of record-keeping and how it contributes to informed decision-making. The education should focus on basic accounting and preparation of farm accounts, budgeting and cost control, negotiation skills, consumer protection (insurance) and how to identify suitable financial products. This is more comprehensive as compared to what is recommended by AgriProFocus, (2011) which does not include negotiation skills, consumer protection and how to identify suitable financial products especially at this era of multiple products from formal, semi-formal and informal sources. Financial inclusion should be noted comprises of several items namely basic banking services, remittances, savings, loans, financial counseling and insurance (Sahrawat, 2010).

5.2.1.2 Number of financial record kept

Second required to encourage farmers to form peer groups where they can learn and discuss their financial record-keeping experience and completeness. Collaborative learning can help address common challenges and share practical solutions. Also, partner with local agricultural cooperatives, NGOs, and government agencies to disseminate information and provide resources for effective financial record-keeping. These institutions can serve as channels for valuable information and support.

5.2.1.3 Financial literacy training

Study also recommend in provision of practical training. Offering practical training on how to effectively maintain financial records can be highly beneficial. This can include guidance on different methods, tools, and software available for record-keeping. Providing hands-on training sessions can empower farmers to adopt systematic practices that suit their specific needs. Likewise, study required to introducing user-friendly digital tools and mobile applications can simplify the record-keeping process for farmers. These tools can make it easier to input and organize financial data, reducing the perceived complexity of record-keeping and encouraging wider adoption.

Findings on financial literacy revealed that the farmers had adequate skills but on further engagement the farmers expressed the need for more education. This high level of education is not in tandem with the application of the knowledge by the farmers. Follow up of trained farmers should be encouraged to ensure maximum benefits from the training are achieved.

Highlight Success Stories: Sharing success stories of farmers who have benefited from diligent record-keeping can inspire others to adopt similar practices. These success stories can be shared through workshops, seminars, newsletters, and community gatherings.

5.2.2 Recommendation for Further Studies

This study was limited only in maize and bean small scale farmers located at Kilolo district found in Iringa Region, with a cross-sectional research design being used. Thus, recommendations is made for the future study to assess the effects of financial records keeping on small scale farmers' profitability by using panel data to allow researchers to capture changes and trends in financial record-keeping practices and their effect on profitability over time. The panel design allows for better establishment of causality between financial record-keeping and profitability. By observing changes in both variables within the same farmers over time, researchers can more confidently conclude that changes in record-keeping practices affects changes in profitability. Panel designs help mitigate endogeneity issues that can arise in cross-sectional studies, where unobserved variables may affect both the independent and dependent variables..

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