Factors Influencing Smallholder Farmers' Access to Formal Financial Services in Morogoro Region, Tanzania

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Abstract

This study was conducted to evaluate smallholder farmers' inclusion to formal financial services in Mvomero, Morogoro Rural and Kilosa districts, in Morogoro region, Tanzania. Specifically, the paper was set to analyse the socio-economic factors that influence the access to formal financial services in the study area. A sample of 240 respondents was covered by the study, whereby multistage random sampling was employed to select respondents in the study area. The data were coded and analyzed with the aid of Statistical Package for Social Sciences (SPSS) computer software. A binary logistic regression model was used to test the effects or influence of socio-economic factors on inclusive formal financial services. Results showed that socio economic factors such as age, income, education, occupation and distance to formal financial institutions affect the access and use of formal financial services ($p<0.05$). The study has also revealed that savings services are popular therefore, used by the majority of adult population, followed by transaction services, credit, then insurance services Conversely, the study concludes that cost of services, ignorance, low income were among the reasons mentioned by the respondents as hindering inclusion to formal financial services in the research area. To this effect the study recommends effective linkages between financial institutions in order to increase the proportion of people with financial access, capacity building to financial institutions, improving infrastructure, improving condition and quality of financial services and to offer finance education to the people.

Keywords: Formal financial services, Socio-economic, smallholder farmers, inclusion

Introduction

Agriculture is a primary source of income to majority of rural people in low-income nations. Agricultural financing is regarded as an essential component of farming output, assisting underprivileged farmers in maintaining their standard of living, implementing cutting-edge technologies, and increasing their incomes (Mariam *et al,*. 2020, The Global Economy is warming up to create an ultimate solution for attaining financial access of people across the world. Besides, smallholder farmers in developing countries, especially in low-income African countries like Tanzania, are at the forefront of those who lacked access to formal credit Moreover, accessibility to high-quality financial services is one of the elements that contribute to economic development. Even though countries in Africa including Tanzania have official financial institutions, there is growing evidence that these institutions are underutilized in terms of agricultural finance. Agricultural finance is regarded as a decisive factor input in farming production, helping poor farmers to maintain consumption of basic necessities, adopt advanced technology and raise their incomes (Hoda &Terway, 2015).. Agricultural finance is used to support agribusiness and farm-related operations like input procurement, processing, wholesaling, and marketing. Savings, insurance, transfers, and loans are examples of financial services that may be needed to support and advance the agriculture industry. With the exception of large processing facilities, agribusinesses, and mostly subsistence-level smallholders located in urban and peri-urban areas, the majority of these activities are conducted in rural areas. The availability of agricultural equipment is improved and agricultural output is increased through increased access to financial services like credit (Abraham, 2018). Financial access is a crucial way for equitable development and the eradication of poverty. Rural poor communities can safeguard themselves from shocks to their income by having access to credit and other financial services, which can also improve the effectiveness and accessibility of remittances (Simatele & Maciko 2022).

The availability and use of formal financial services has been the subject of numerous studies. Khiev and Yuciy (2022) examined the impact of financial remittances in determining the usage of formal and informal financial services. They discovered that formal remittances encourage the use of formal financial services like credit and savings. Omojolaibi (2020) investigated if women in Nigeria are financially excluded from financial services. The findings showed that most women are economically disadvantaged due to their low levels of education. Binoy and Subhashree (2020), evaluated the behavioral and psychological aspects impacting the usage of formal financial services among low-income households. The findings reveal half of these accounts are either inactive or less active in accessing financial services. Colin and Alain (2020) conducted a study on the effect of financial services on monetary well-being in Uganda. The findings show adversely linked to the use of official banking services. Wabwire (2020) looked at the demographic variables affecting smallholder farmers in Kenya who use mobile phones to access formal financial services. The results showed that demographic variables were significant in predicting Kenyan smallholder farmers' use of mobile phones for formal financial services.

Ozili, (2021) analyzed how financially included adults might become unbanked again. The results reveal that constraints such as lack of access to modern information and communication, the ability of impoverished banked adults to utilize basic financial services to the greatest extent is limited by technology, a lack of financial services that cater to the needs of all customers, excessive debt, and inability to manage the existing debt. Yang *et al.* (2020) investigated how credit restrictions imposed by formal financial organizations affected the health of rural Chinese citizens. The findings demonstrate that credit restrictions imposed by conventional financial institutions have a significant negative effect on the self-rated health of rural residents in subgroups of men, women, married people, and single people. Furthermore, the findings show that formal financial institutions' loan restrictions have an impact on rural inhabitants' health through their income and economic vulnerability. Masinde (2019) conducted research on small-scale farmers in Kenya who use formal and informal banking services. The research shows that among small holder farmers, the use of formal financial services was not diluted by the use of informal financial services.

Faizan and Ambreen (2020) conducted a study on formal financial penetration and households ‘welfare in Pakstan. The study suggested that formal financial access along with other factors like annual income, family education level, the number of earners in the family, loans taken out by the family, ownership of land and buildings, and the head's employment, significantly and positively influence household welfare. Soedarmono (2017) studied on the relationship between financial literacy and the need for financial services in Indonesia's remote regions. The findings show that the demand for bank loans is more positively impacted by financial literacy in younger, better educated people. Djekonbe and Tidjan (2022) investigated into how Sub-Saharan Africa's human development is impacted by financial access. The results establish that higher financial access results from enhanced access to and usage of formal financial services, which in turn has a favorable and considerable impact on human development in sub-Saharan Africa. Tefera *et al.* (2022) studied on the elements influencing financial access in rural areas. The findings reveal that factors including accessibility to traditional financial institutions, financial literacy, age, and secondary education in rural areas, as well as the availability of Islamic banking services, have a beneficial effect on these factors. The incapacity of rural people to access formal financial institutions and their mistrust of traditional financial institutions are significant constraints.

Using household data from Peru, Jacoby (1994) found that lack of access to finance reduce the likelihood that poor household send their children to school. Similarly, Jacoby and Skoufias (1991) show that household from India villages without access to finance such as credit market tend to reduce their children's schooling when they suffer transitory shocks than households with greater access to financial services. Beegle, (2000) use a household panel survey in Tanzania to show that transitory shocks (Crop shocks) lead to greater increase in child labour in household with fewer assets (which are used both as buffer stocks and collateral for borrowing). Guarcello and Rosati (2013) used data from Guatemala and show that child labour increases in response to broadly defined income shocks and self-reported credit rationing. The importance of access to finance in innovation and technology diffusions is shown by Guarcello and Rosati (2005) in southern India. They found that investment in the absence of credit market can only be afforded by wealthier people.

In Tanzania, access to financial services has remained constrained, despite all of the policy and strategic initiatives that have been made over the past ten years and the rise in the number of financial institutions. Just 11% of Tanzania's population has access to official financial institutions, according to statistics from the national study on demand for and barriers to obtaining financial services, which found that 89% of respondents did not have a formal bank account. This rate is very low and cannot accelerate Tanzania's economy's growth in order to achieve the Sustainable Development Goals. Majority of Tanzanians still are not able to access banking services. Instead, many are compelled to depend on a small number of informal financial service providers, which are frequently very costly and risky. This limits smallholder farmers' ability to participate fully in financial markets, which would raise their income and support agricultural production. Due to their frequent problems raising money on a large scale and spreading risks across many people, independent microfinance institutions cannot by themselves cover the gap in the provision of financial services (Anne *et al.,* 2005).

The mentioned arguments above are the motivation and justification for this study. The purpose of the study is therefore to determine if smallholder farmers in the study area have sufficient access to formal financial services. In particular, the study provides information on the factors that influence smallholder farmers' access to formal financial services and the key challenges those smallholder farmers in Morogoro region.

Research Methodology

The study area

The study was conducted in Morogoro region which is located in the eastern part of Tanzania Mainland. The study was conducted in Morogoro due to the fact that the region is one among those that harbor many different cropping and livestock activities. The Region lies between latitudes 35025" and 1000" south of the equator and between the longitudes 35025" and 380 30" east of Greenwich. Seven neighboring regions border it: to the north are Tanga and Arusha, to the east Coast Region. On the western border are Dodoma and Iringa while Ruvuma boarders it to the south. The southeastern border is bounded by Lindi Region. Administratively the region has six districts namely Morogoro urban, Morogoro rural, Kilosa, Kilombero, Ulanga, Mvomero and Gairo.

Sampling procedure and sample size

A multistage random sampling technique was employed to select the study areas as it covers large area. Three districts out of seven were selected from the region, namely; Mvomero, Morogoro rural and Kilosa. These locations are within the same livelihood zones within which people share broadly the same pattern of livelihood, that is, the same production system (agriculture and livestock keeping) The study selected six wards from the selected districts (ie two wards from each district). The wards selected were Mtibwa and Mkindo (Mvomero), Mikese and Fulwe (Morogoro rural) and Kasiki and Mbumi (Kilosa). Simple random sampling was used to select respondents for interview from the selected wards in each ward depending on the location.

The sample size n was calculated using equation for unknown population specified below (1)

$$n = \frac{Z^2 pq}{d^2} \quad \text{..........(1)}$$

Where;
Z^2 = Standard normal deviation, set at 1.96 corresponding to 95% confidence level
p = proportion in the target population estimated to have a particular characteristic;
q = 1.0 – P
d = degree of accuracy desired, set at 0.05 and
n = Sample size
From the equation n is approximately 240. Then the systematic random sampling technique was used to select respondents from the three districts.

The model and its techniques

The probability of having access to formal financial services was estimated using the binary logistic regression model and maximum likelihood techniques. The aim of choosing this model is to ascertain the likelihood that a person with a particular trait will choose one option over one or more alternatives (Gujarati, 1995). Choice models forecast the likelihood that a person would select a sequence of action that is related to their personal characteristics and socioeconomic factors. As coefficients of the logistic model are usually difficult to interpret directly, marginal effects are also reported in order to measure the discrete change of the outcome (dependent variable) when an explanatory variable (independent variable) changes, if other variables remain unchanged. The binary logistic qualitative choice model is based on the cumulative distribution and is specified as;

$$P_i = E\left(Y_i = {}^{1}/_{X_i}\right) = \frac{1}{1 + e^{zi}} \quad \text{..........(2)}$$

Where
e is the base of nature logarithms, for choice 1 (success and Y=0 (otherwise) P is the probability that an individual will make a certain choice when faced with two choices: given x; individual characteristics (Brown, 1991)

$$1 - P_i = \frac{1}{1 + e^{zi}} \quad \text{..........(3)}$$

The probability of making one choice relative to the other is calculated by;

$$\frac{P_i}{1 - P_i} = \frac{1 + e^{zi}}{1 + e^{zi}} = e^{zi} \quad \text{..........(4)}$$

Taking the natural log of equation (3) will give the values of the logistic L_n as illustrated in the equation used in this study as follows;

$$L_n \frac{P}{1-P} = \alpha + \beta_1 AGE + \beta_2 SEX + \beta_3 EDUC + \beta_4 OCCUP$$
$$+ \beta_5 LEVI + \beta_6 DISTA + \beta_7 OFFINC + \beta_8 INTR + \beta_9 BOWNP + \beta_{10} EXTCO + \beta_{11} LIVEO + \beta_{12} FARMS \ldots(5)$$
$$\text{..........(5)}$$

$L_n \frac{P}{1-P}$ =Is the dependent variable which is the natural logarithm of the probability of having access to formal financial services (P) divided by the probability of not having access to those services (1-P). It takes the value of 1 for access and 0 for no access
α = Intercept (constant)
β_1= Parameters to be estimated using maximum likelihood techniques q
μ_1= is the stochastic disturbance term $\mu \sim N(O, P_I, 1-P_I)$

Data sources

Both primary and secondary data were used in this study. The survey covered collection of both qualitative and quantitative information. Secondary data collected for this study were from various reports and publications such as BoT bulletins, Household Budget Surveys, NMB and NIC. Most of the publications were found at the Sokoine National Library (SNAL). Primary data were sought from residents in surveyed areas. The study collected information regarding issues pertaining to access to formal financial services.

Data analysis
Quantitative data analysis

Quantitative analysis involved computation of descriptive statistics such as percentage, frequencies, averages, and cross tabulation analysis. Descriptive analysis undertaken in this study involved a number of descriptive statistics. It was used to present characteristics and distribution of individuals in various aspects studied such as socio- economic characteristics and types of formal financial services offered. .

Table 1: Specification of variables included in regression analysis

Independent variable	Variable description	Variable type	Expected signs
AGE	Age of respondent	Continuous (Years , numeric)	+
SEX	Sex of respondent	Dummy (Male 1, female 0)	+
EDUC	Education level	Dummy (Literate 1, Illiterate 0)	+
OCCUP	Occupation	Continuous 1, 2, 3……..n	+
LEVI	Level of income	Dummy (high 1 , low 0)	+
DISTA	Distance to financial institutions	Continuous (Numeric, km)	_
OFFINC	Off- farm income	Dummy (Yes 1 , no 0)	+
INTR	Rate of interest	Dummy (1 high, low 0)	_
BOWNP	Borrowing procedure	Dummy (1 complicated, 0 not)	_
EXTCO	Extension officer contact	Continuous 1,2,3…..n	+
LIVEO	Livestock ownership	Continuous 1,2,3…..n	_
FARMS	Farm size	Continuous (count, 1,2,3…..n)	+

Results and Discussion

Access to formal financial Services

According to survey results Table 2 shows that, only 36.7% of the respondents had access to formal financial services. These results are in conformity with that of Financial Sector Deepening Trust (2006; 2013) which shows that majority of people in Tanzania have no access to formal financial services.

Table 2: Distribution of respondents by access to formal financial services (%)

Access to formal financial services	Mvomero	Morogoro rural	Kilosa	Total
	n = 80	n = 80	n = 80	N = 240
Yes	15.0	10.0	11.7	36.7
No	18.3	23.3	21.7	63.3

Reasons of having access to formal financial Services

Regarding reasons of having access to formal financial services results show that, large proportion of respondents, 48.1%, have access on their own decision, while 30.4% have access due to service conditions. Similarly, only 21.5% have access due to job conditions due to the placement of deposit and payment of salaries toward locally owned banks. Respondents further presented reasons that led them to use services from selected institutions. The major reported reasons as shown in Figure 1.

Individuals who use the services due to the nature of services required are in the majority 47.6% while other reasons such good services were recorded 26.2% and 26.2% have no option. These results appear to suggest that people are obliged to have access due to nature of services required, for instance savings, money transfer, payments and loans. Similar results have also been reported by Financial Sector Deepening Trust (FSDT, 2013). Further, results give challenges to financial institution to improve services accordingly in order to attract and convince people use these institutions especially those having no option.

Reason of not having access to formal financial Services

The survey was also able to explore the reasons for financial exclusion i.e. not having access. Table 3 shows that 7% of the smallholder farmers were not accessing due to not qualifying. Nine percent prefer dealing in cash, 15% not trust banks. Further 16% said it is expensive to have access, whereas 20% specified that the bank is too far, 18% claimed that minimum balance in the bank is too high,

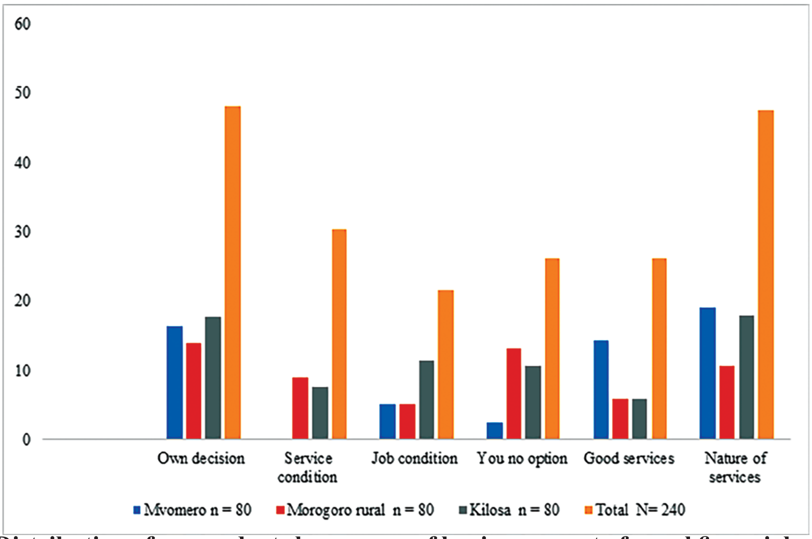

Figure 1: Distribution of respondents by reasons of having access to formal financial services (%)

similarly 22% mentioned that they do not know how to open an account. Not having a job is among the reasons, which were reported by 24% of the respondents. Thirty percent said they don't have money to deposit into a bank. The findings were supported by the results of FSDT (2006), which showed that the majority of Tanzanians lack access due to a lack of steady income. The findings also seem to indicate that a bigger proportion of people will use formal financial services, the lower the cost of those services must be. Low-income individuals are typically limited to cash transactions and do not profit from the advantages that various financial services can provide.

Furthermore, the results are in line with that of Anjali *et al.* (2004) suggesting that demand limitation (such as no need, no savings and no awareness) and supply limitations (such as high costs minimum balance and documentations) affect access to formal financial services. Large proportion of those who do not have access may not easily be able to afford to maintain a bank account therefore simplified but low-cost accounts may be valuable to low-income individuals (Anjali, 2005).

Table 3: Distributions of respondents by reasons of not having access to formal financial services (%)

Variables	Mvomero	Morogoro Rural	Kilosa	Total
measured	n 80	n 80	n 80	N 240
Don't qualify	1.5	3.4	2.1	7.0
Prefer dealing in cash	2.3	4.2	2.5	9.0
Don't trust banks	4.0	5.0	6.0	15.0
Expensive to have access	5.0	5.4	5.6	16.0
Bank is too far	3.2	10.0	6.9	20.1
High minimum balance	4.2	7.0	6.8	18.0
Don't know to open account	5.4	10.3	6.5	22.2
No job	6.9	9.1	8.4	24.4
Don't have money to put in bank	9.3	10.0	10.7	30.0

Note: Figures have multiple responses

Frequency of access to formal financial services

During the survey, the respondents were asked on how many times they access to financial services. The results in Table 4, indicate that majority of respondents (94%) fall in the frequency of 1-5 per month while a frequency of 5-10 per month was recorded by only 3.6% compared to a frequency of >10 times per month which stated by only 2.4% .The result suggest that the lower the income the lower the frequency of access to formal financial services and the vice-versa. The large proportion of respondents in 1-5 times category was caused by high level of respondents with low income in the study areas.

Table 4: Distribution of respondents by frequency of financial services access (%)

Frequency	Mvomero	Morogoro rural	Kilosa	Total
	n=80	n=80	n=80	N=240
1 – 5 times per month	32.1	27.4	34.5	94.0
5 – 10 times per month	2.4	0	1.2	3.6
> 10 times per month	2.4	0	0	2.4

Logistic regression results showing factors affecting access to formal financial services

The logit model was used to determine the key variables affecting formal financial access, and the marginal effect technique was used to determine how the explanatory variables impacted the dependent variables. Table 5 shows that the following factors are most important in determining whether households of smallholder farmers have access to formal financial services: age, education, and income, contacts with extension agents, off-farm income, interest rate, and lending procedures. At the 1% and 5% levels of confidence, it is determined that these variables are statistically significant. Therefore; each of these variables will be discussed, the other factors, including sex, farm size, employment status, and ownership of livestock, are discovered to be statistically irrelevant. As a result, each of these variables will be discussed.

The coefficient of age is positive suggesting that older smallholder farmers are more likely than younger ones to be able to obtain formal financial services. This means that the likelihood of using formal financial services rises by 0.3% for every additional year of household age while holding all other factors constant. This may be because the household head becomes more knowledgeable and conscious of how to access and use money as they get older and have more experience. Additionally, after residing in the village for a longer period of time, household heads gain more social acceptance and are more readily able to form credit-granting groups.

The evidence of the influence of education was shown by estimated values of coefficient of education and marginal effect which are statistically significant. This implies that the likelihood of having a formal account increases if respondent has higher attainment level in education. Specifically, famers who completed secondary school are more likely own an account in formal sources of finance in comparison with those who only finished primary school. The effect is even stronger if the highest educational attainment of respondent is tertiary and more. The predicted probability of having a formal account of tertiary-level respondent is higher compared to primary-level respondent. The results agree with those of Mariam *et al.* (2020), who found that formal financial access as well as other factors like education level had a significant impact on household welfare. Wahyoe and Agustinus (2017), discovered that although this effect is more evident for older and highly educated populations, people with higher financial literacy also tend to have formal savings accounts. Both the income coefficient and the marginal effects are statistically significant. This shows that the likelihood of a person having an account with a genuine financial institution increases with their income.

Further the findings show that the coefficient of rate of rate of interest is negative. This implies that the higher the interest rate the lower the credit received by smallholder

Table 5: Logistic regression showing factors affecting access to formal financial services

Variable	Coefficients	Marginal effects
Sex	0.00437	0.00135
	-0.089	-0.0274
Age	0.0393**	0.0121**
	-0.018	-0.00551
Education	0.504***	0.155***
	-0.0603	-0.0167
Occupation	0.173	0.0533
	-0.0116	-0.0356
Income	3.333**	0.0043
	-0.0013	-0.692
Distance	4.946	0.00616
	-2.179	-0.049
Off farm income	1.218***	0.1983***
	-0.4227	-0.0065
Rate of interest	0.1041***	0.1878***
	0..4430	0.0863
Borrowing procedure	0.1533***	−0.1409***
	0.4075	(0 .0488)
Livestock ownership	−0.1774	−0.0211
	-0.1685	(0 .0187)
Extension officer contact	−0.3106***	−0.0370 ***
	-0.0895	(0 .0112)
Farm size	−0.3407	−0.0406
	-0.8068	-0.1071
Constant	2.355	
	-0.418	

farmers. The repercussion is that if the interest rate increases by 1% while other variables remaining constant, the possibility of accessing formal financial services decreases by 10%. This is maybe caused by smallholder farmers being less inclined by borrowing money at higher interest rates which in turn discourages low-income farmers to acquire loan from formal financial services.

Regarding the borrowing procedure, the results show a negative coefficient suggestion that financial services with lengthy procedures causes lower chances of receiving formal financial services than services with shorter and quick lending procedures. This implies that the likelihood of getting loans is reduced by 15% if credit with long lending procedure increases by 1% holding other parameters constant. The procedure of loan application may hinder smallholder farmers from obtaining loans from formal financial services.

Conclusion and recommendations

The objective of the paper was to pinpoint the elements that affect Morogoro region smallholder farmers' access to formal banking services. The findings indicate that access to formal financial services for smallholder farmers is influenced by factors such as income, age, education, access to extension services, off-farm income, rate of interest, and borrowing method. However, considering that access to financial services is typically influenced by socioeconomic variables.

The study has highlighted some very important clues which are worth noting. There should be a more widespread and effective links between the formal, semi -formal and informal financial sectors in order to increase the proportion of smallholder farmers accessing formal financial services. Links between the financial sub- sectors allow for both broadening and deepening financial services by giving smallholder farmers access to cheaper and a wider range of financial products. However, the study has highlighted some very important clues which are worth noting. There should be a more widespread and effective links between the formal, semi -formal and informal financial sectors in order to increase the proportion of smallholder farmers accessing formal financial services. Links between the financial sub-sectors allow for both broadening and deepening financial services by giving smallholder farmers access to cheaper and a wider range of financial products. However, this process has a long way to go when the majority of people can have, in effect, access to bank, even if they are not directly account holders. The government should continue to ensure that the link evolves spontaneously between commercial banks and the rest of the financial service providers. This is the most crucial ingredient required in the course of performing its promotional role on programs focused on access to financial services and poverty alleviation. Another aspect is capacity building. It is obvious that information and analysis from researches are necessary but not sufficient to promote greater access. Building capacity must be a top priority since Tanzania's lack of adequately skilled human capital to supply technical and management skills is a crucial constraint in the development of many economic sectors. SACCOs and MFIs won't be willing to cooperate with commercial and other formal financial institutions, especially when it comes to extending loans, unless they are perceived as reliable and creditworthy competitors. As a result, capacity building requires significantly more work.

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