ACCESS TO AGRICULTURAL CREDIT FOR SMALLHOLDER FARMERS IN SHINYANGA REGION –TANZANIA

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ABSTRACT
This paper analyses the access to agricultural credits for smallholder rice farmers in ShinyangaRegion- Tanzania. Specifically, it describes thesources of credit facilities available to the rural area and the factors determining access to agricultural credit in the study area.A multi-stage random sampling technique was used. Two district councils that were the largest producers of rice were purposively sampled; these include Shinyanga and Msalala. A total of 180 rice farming households were selected from the smallholder farmers using a simple random sampling technique.Data on demographic and farmer-household socioeconomic characteristics that are likely to affect small-scale farmers' decisions to take out agricultural credit were collected using a semi-structured questionnaire. In this study, descriptive statistics and the logit model were used. The study revealed that sources of agricultural credit were cooperative institutions, personal savings, individual money lenders), relatives/Friends, Microfinance Institutions, and Commercial Banks. Furthermore, the study found that factors such as gender, household size,household income, membership in cooperative institutions, land size, and asset value positively influence agriculture credit in the study area. However,age and livestock ownership found to havea negative influence in accessing agricultural credit. The study recommends that farmers and cooperative stakeholders insist that farmers form the self-help groups like cooperative institutions asthe compatible source of agricultural credit in the rural area.

Keywords: *Agricultural Credit, Credit facility, smallholder farmers, logit model, credit institutions*
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1. INTRODUCTION

Agriculture dominates the economies of developing countries, contributing significantly to income generation, employment, and gross domestic product (GDP). For example, in Tanzania, agriculture accounts for about 29.1% of the country's GDP, contributing to about 40% of export earnings, and employs 75% of the country's workforce (NBS, 2017). The agricultural sector's growth and development are linked to the economy's growth and farmer welfare (Cheong, Jansen & Peters, 2013).Raising farmer productivity and output allows agricultural products to be diversified into agro-processing and commercialization, resulting in economic structural changes (Salami, Kamara, and Brixiova, 2010).The adoption of modern agricultural technology, which is dependent on smallholder farmers' access to agricultural credit, is critical to the farming sector's productivity (NBS, 2017). On the other hand, increasing agricultural productivity creates

employment, enhances farm incomes, and boosts farm household self-sufficiency, both of which enhance food security (FAO, 2015; IFAD, 2011). Low agricultural productivity is commonly attributed to the use of inefficient equipment as a result of limited access to agricultural credit. Furthermore, it is believed that the lack of credit has discouraged many young people from entering the agricultural sector, leaving the majority of them jobless due to a lack of investment resources and incentives (FAO, 2015; IFAD, 2011).

Agricultural financing is an essential factor in farming operations because it allows poor farmers to meet their basic needs, introduce advanced technologies, and increase their earnings. Agricultural financing is a crucial component of agricultural growth, assisting poor farmers in meeting their basic needs, implementing cutting-edge technology, and raising their incomes (Abdalla and Ebaidalla, 2012).As a result, credit is an effective tool for growing agricultural production, fostering economic development, and reducing poverty.In addition, the financial sector is said to play an essential role in agricultural production because it facilitates the acquisition of capital for farm productivity growth, storage, processing, and packaging, transportation, insurance, and marketing of agricultural products. However, only 6% of Tanzanians have access to bank loans, with only 1% of total loans with agricultural loans. This is because high-risk lending to farmers is one of the main bottlenecks in the banking industry (ESRF, 2015).Furthermore, it is believed that a shortage of credit has discouraged many young people from entering the agricultural sector, leaving the majority of them jobless due to a lack of investment resources and incentives.

Smallholder credit acquisition is one of the most important aspects of agriculture and economic growth. Still, its access remains a significant challenge for smallholder farmers in many developing countries, including Tanzania. The possible reasons for this are that smallholder farmers often need small loans that are difficult to handle, and the majority of them lack the necessary collateral to obtain a loan from formal financial institutions (Taremwa*et al*.2021;Oke*et al*.,2019;Michael *et al*.2018; Nwankwo,2017).since agriculture is the most crucial sector in developing countries, smallholder farmers need access to credit.In addition, Kimaro(2020) argued that microfinance institutions should make credit sources with affordable conditionality accessible and affordable to smallholder farmers to obtain financial services for livelihood diversification strategies. Moreover, he stated that local government authorities, in collaboration with extension officers, should take deliberate steps to mobilize smallholder farmers to take advantage of available economic opportunities such as loans from microfinance institutions such as Savings and Credit Co-operative Society (SACCOS) and Village Community Banks (VICOBA), where they can obtain capital for investment. Since low agricultural productivity is commonly attributed to poor technology as a result of restricted access to agricultural credit, the following research questions arise: what are the sources of agricultural credit in the study area? What factors influence smallholder farmers' access to credit in Shinyanga?

This research is timely, particularly when Tanzania's government is advocating for transforming the agricultural sector from subsistence farming to commercialized activities. Agricultural finance is critical in transforming the agricultural sector because it creates multiple job opportunities for many people and improves the livelihoods of Tanzania's smallholder farmers.Agricultural credit is required to purchase agricultural inputs such as high-quality seeds, fertilizers, pesticides, and herbicides and the adoption of improved farm technology, farm implements, and the rental of arable land.As a result of the agricultural sector's importance, more resources must be allocated to poor smallholder farmers to boost agriculture production, especially in obtaining agricultural credit.These, therefore, justify conducting the study on available sources of agricultural credit and determinants of farmers' access to agricultural credit in Shinyanga.

Furthermore, there is a substantial number of empirical studies on the sources and factors that influence farmers' access to agricultural credit in developing countries. (Taremwa*et al*.2021;Moahid&Maharjan, 2020;Ullah*et al*.,2020;Oke*et al*.,2019;Chandio*et al*., 2018; Isaga,2018;Michael *et al*.2018;Ogundejji*et al*.,2018;Saqib *et al*.2018;Nwankwo,2017;FinScope Tanzania2017;Ahmad *et al*., 2016;Anang*et al*.,2015; Ijioma&Osandu, 2015; Motsoari*et al*.,2015; Gandhimathi&Ambigadevi 2014;Idoko ,2013;Ugwumba and

Omojola2013;Abdalla and Ebaidalla, 2012;Wabei 2012;Nyende, 2011;Doan *et al.*,2010). In developing countiriesthe majority of these studies investigate the factors that affect smallholder farmers' access to agricultural financing, while others examine agricultural finance channels (Jha, 2019).In terms of agricultural credit, the findings revealed that informal relatives, neighbors, selling some crops/livestock and using the capital, accumulated personal savings, and formal sources such as borrowing from financial institutions were all common sources of credit in rural areas.Land tenure status, family labor, marital status, literacy status, off-farm income, the value of non-fixed assets, the value of assets related to agricultural activities, infrastructure quality, collateral, high-interest amount. For example (Mgebebu and Achike, 2017), found that bureaucratic loan processing family size; experience of the household head in credit use; ownership of a farm were all common factors that determined access to agricultural credit.

While some empirical studies on the sources and determinants of smallholder farmers' access to agricultural credit have been conducted in developing countries, there is a paucity of empirical literature in Tanzania. For example, studies (Isaga, 2018; Stein *et al.*, 2016) focus on the factors that influence smallholder farmers' access to bank credit. Isaga (2018) looked into the factors influencing smallholder farmers' access to bank credit in Mvomero District. Still, it didn't look into other sources of credit, which are also crucial to policymakers.Stein *et al.*, 2016 studied customary rights and credit allocation to agriculture, but the study did not solely focus on determinants of agricultural credit access. Therefore,the the results of this study cannot be generalized to other agricultural credit sources available to smallholder farmers in rural areas.By quantifying different sources of agricultural credit for smallholder farmers and determinants of credit access in the Shinyanga region using a logistic regression model, our study contributes this information and narrowing this relevant knowledge gap. The findings of this study will help advise policymakers on how to promote adequate credit access and how this can help Tanzania achieve long-term rural development.

2. MATERIALS AND METHODS

The study area is the Shinyanga region, which comprises three Districts:Kahama, Kishapu, and Shinyanga. Administratively the region is divided into six local government authorities; that is Kahama town council, Shinyanga Municipal council,Kishapu, ShinyangadistrictMsalala and Ushetu District council. The region has a total surface area of 18,555 square kilometers. Shinyanga region has mono-modal rainfall distribution, which gives rise to only one cropping season. The average rainfall of the region is 600-1,000mm per annum. A multi-stage random sampling technique was used. Two district councils that were the largest producers of rice were purposively sampled; these include Shinyanga and Msalala. In the second stage three largest irrigation schemes from the sampled district council in the first stage were also purposively selected; these were Nyida and Dutwa, both from Shinyanga District, and Chela from Msalala District council. In the third stage, simple random sampling was applied to select respondents from the selected irrigation scheme in the second stage. A total of 180 farming households were selected from the farming community using a simple Random Sampling Technique. This technique was used,considering cost implications and other relevant factors such as the extent of the study area. The study concentrated on short-term credit; thus, cross-sectional data was used.

To achieve the objectives of the study, useful information on main socioeconomic characteristics was gathered using a questionnaire. Moreover, information o demographic characteristics that were considered to affecting smallholder farmers' decision on whether or not to take agricultural credit were collected. The factors include, amongst others, the following: Age, gender, marital status, household size, land size in acres, membership in cooperative societies, and distance in kilometer from source farm credit, livestock ownership, asset value, and entrepreneurial experience. To analyse study objective one, descriptive statistics such as frequency and percentage were used.The study objective two was analyzed using the logistic regression model.The logistic regression model is a binary choice model based on the assumption that farmers would have to choose between two options based on unique identifiable characteristics.This means that one can predict which of the two alternatives an individual or household is likely to belong to given certain observed information (Verbeek 2004:Green 2003). When the dependent variable y is binary (a dummy), It is usually set to one for all observations in the data for which the event of interest has occurred (success) and zero for the

rest (failure). The sample mean of the binary choice variable is an unbiased estimate of the unconditional likelihood that the event occurs if we have a random sample (Söderbom, 2009).

Ordinary least squares (OLS) regression is insufficient when we have discrete dependent variables.The linear probability model's biggest flaw is that it allows for illogical predictions (there's nothing to tie the value of y to the (0,1) range), and linearity doesn't make much sense conceptually (Verbeek 2004: Green 2003). When dealing with such cases, probit and logit techniques become more relevant. The logit model restricts the approximate probabilities to a range of 0 to 1. It also relaxes the requirement that the independent variable's effect is constant over various expected values of the dependent variable (Söderbom, 2009). In general, qualitative response models have dependent variables that can only take values from a small range of possibilities. In binary response model, for example, we have $y_i \in \{0,1\}$. Usually $y_i= 1$ denotes a success, or that a certain event occurred and $y_i= 0$ denotes a failure or that the event did not occur. In this case, access to agricultural credit was termed as success ($y_i =1$) and ($y_i=0$ otherwise). The logit model is preferred and used to analyze the determinants of farmers' access to agricultural credit in this study. Assume that,the response variable y_i is binary choice varaibe which assumes only two possible outcomes denoted as 1 and 0. Consider also a vector of covariate x_i which are assumed to influence y_i. We assume that the model has the following form:

$Pr(y = 1|x) = \Lambda (x\beta) = \frac{exp^{(x\beta)}}{1 + exp^{(x\beta)}}$,For all values of x (remember, x is a scalar), which is between zero and one. This is a logistic variable's cumulative distribution function (CDF) (Annang, 2015; Söderbom, 2009).
x_i Represents a vector of explanatory variables, β Represents coefficient parameters.
In this study, the odds ratio or relative risk for the logit model is reported. The main reason for reporting the odd ratio instead of the coefficient is that interpretation of logit estimates is not straightforward than what we are used to for linear regression(Söderbom, 2009).The odds ratio or relative risk is $p/1 - p$ and measures the probability that y=1 relative to the probability that y=0 was specified as;P= $\frac{exp^{(x'\beta)}}{1 + exp^{(x'\beta)}}$, then,$p/1 - p$ =$exp^{x'\beta}$
Applying the natural logarithm;$p/1 - p$ =$exp^{x'\beta}$; $ln \frac{p}{1-p} = x'\beta$.

Table 1: List of explanatory variables used in the logistic regression model

Variable name	Variable type	Variable description	Expected sing
Age	Continuous	Age of the respondent (in years)	+
Gender	Binary	Gender respondent(male=1, female=0)	+/-
Marital status	Binary	Marital status of the respondent(1=married, 0 otherwise)	+/-
Education level	Continuous	Education level of the respondent (in years)	+
Household size	Continuous	Number of household members	+
Access to extension services	Binary	Contact with extension office in last 12 month (1=yes, 0=no)	+
Land size	Continuous	Land size in acres	+
Membership in cooperative	Binary	Membership in cooperative societies (1=yes, 0=no)	+
Distance to the credit source	Continuous	Distance in km from the household to the credit source	_
Livestock ownership	Binary	Livestock ownership (1=yes, 0=no)	+
Value of asset	Continuous	Asset value (in Tshs)	+/-
Entrepreneurship experience	Continuous	Entrepreneurship experience (in years)	+

3. FINDINGS AND DISCUSSION

3.1 Social characteristics of Respondents

Table 2 presents the social characteristics of respondents in the study area. The results showed thatmost respondents were males (79.44%) while females (20.56%). These results support the assumption that men are more likely to participate in farming activities because it is muscular. Most males are the heads of families where women are subject to their husbands' influence.The findings of this study support previous results (Ijioma and Osondu 2015; Machimu and Kayunze, 2020) that farming activities, especially small-scale farming, are dominated by men because women are only involved in simple farm tasks like weeding, harvesting, and marketing.

Moreover,table 2 shows that 9.44%of their age ranged between 21-30, 26.67% aged between 31-48; 30.56% aged between 41-60; 26.11% aged between 51-60; 5% aged between 61-70 and 2.22% were above 71 years old. Furthermore, the results revealed that agriculture activities were dominated by a more significant population of people between the ages of 21 and 60, implying that people at this age are energetic enough to participate in farming activities while also handling the stress associated with farming operations.The study's findings also showed that most respondents had completed primary school education, with just 7.78 percent having no formal education.This suggests that the majority of small farmers were knowledgeable about farm credit issues, had access to credit details, understood credit terms, could properly complete loan application forms, and were aware of the effects of credit facilities on-farm production.In terms of the respondents' marital status, the findings indicate that the majority of respondents were married, with 82.77% married and 17.22% single, implying that the majority of respondents had household responsibilities to fulfill for their families.

Table 2: Social Characteristics of Respondents

Variable	Frequency	Percent (%)
Male	143	79.44
Female	37	20.26
Total	**180**	**100**
Age		
21-30	17	9.44
31-40	48	26.67
41-50	55	30.56
51-60	47	26.11
61-70	9	5
71+	4	2.22
Total	**180**	**100**
Education level		
No formal education	9	5
Primary level	86	47.78
Secondary level	56	31.11
Tertiary level	29	16.11
Total	**180**	**100**
Marital status		
Married	149	82.77
Single	31	17.22
Total	**180**	**100**

3.1 Sources of agricultural credits

Table 3 presents various sources of agricultural credit in the study area. The study findings revealed that the source of agricultural credit in the study area includes; commercial banks,microfinance institutions, cooperative societies, individual money lenders, personal savings, and friends or relatives. Furthermore, the findings revealed that 3.89 percent of respondents obtained credit from commercial banks, 8.33% from

Microfinance Institutions such as Non-Governmental Financial Institutions, and 33.89% from Cooperative Societies such as Savings and Credits Cooperative Societies (SACCOS), Village Co-operative Banks (VICOBA), and Rotating Saving Schemes Association (ROSCAs)and Sukuma Traditional Saving Schemes (Ifongong'ho).Similarly, about 27.22% obtained agricultural credit from their savings, 17.78% from local money lenders, and 8.89% from friends or relatives.

Table 3: Credits Sources of farm activities

Sources of Credit	Frequency	Percentage (%))
Commercial Banks	7	3.89
Microfinance Institution	15	8.33
Co-operative Institutions	61	33.89
Personal Savings	49	27.22
Individual money lenders	32	17.78
Friends or Relatives	16	8.89
Total	**180**	**100**

The study's results imply that cooperative institutions (registered and unregistered) are the primary source of agricultural credit in the study area, accounting for 33.89% of all sources of credit in the study area. The cooperative institutions seemed to be more appealing due to the ease with which they can obtain loans, such as the lack of a need for collateral and the lowinterest rates charged. In most cooperative institutions, collateral is substituted for personal guarantees since credits are issued to members known to a group, simple loan processing procedures, and loan conditions are set by their members.Meanwhile, personal savings from crop stock sales, livestock sales, and entrepreneurial activities were the next most preferred source of credit, as this source was thought to have no costs such as interest rates.Individual money lenders tended to be one of the credit sources, but respondents reported a costly source due to the higher interest rate expected to be paid. Farmers were forced to obtain credit from this source because it was an easy choice for them with unsophisticated procedures, and the average interest rate paid ranged between 15% and 25% per month.

In light of these results, farmers had fewer options for credit from more formalized financial institutions such as commercial banks. The likely explanation is the difficult conditions placed in obtaining credit (for example, collateral protection, a borrower's need to go through legal entities, etc.) and the small number of banks in the region where this study was conducted.The other probable reason is that agricultural activities, especially smallholder farming activities, are perceived as high-risk activities in the absence of weather crop index insurance. It can be concluded that, despite the availability of various credit sources in the study area, farmers' preferred credit sources are determined by the following criteria: loan application procedures, credit institution presence, credit institution form (member-based/cooperative or non-member based), and credit costs.

3.2 Determinants of access to Agricultural credits

This sub-section reports the discussion of the results of the logistic regression model. The explanatory variables were included in the model to determine factors that drive or constrain agricultural access. These variables were credit, age, gender, marital status, education level, household size, household income, access to extension services, land size, membership in cooperative societies, distance from the source of credit, livestock ownership, andthe asset's value of the farming households.The study findingsrevealed that the gender of the household head, household size, household income, land size, membership in cooperative societies, and asset value positively influence access to agricultural credit. In contrast,the age of the respondents andlivestock ownership were observed to constraints access to agricultural credit in the study area.

The findings indicate that the gender of the household head positively affects access to agricultural credit. The study revealed that being a male is likely to affect 3.64549 times the access to agricultural credit than

being female. The positive relationship is statistically significant at a 5% level of significance (p=0.013). The explanation for this may be that men are better endowed with resourcesfavored by cultural norms and more collateral, making them more likely to access and take out agricultural loans. The results of this study agree with the previous research (Quisumbing&Pandolfelli, 2009), which shows that female farmers in Sub-Saharan Africa have less access to credit than men.Moreover, they argue that some factors contribute to this, including women's lack of asset ownership and control over resources, such as land and valuable equipment that can be used as loan collateral, as well as limited education, cultural, and social barriers.

Table 4: Factors that drives or constraints access to agricultural credit in the study area

Variable	Odd ratio	Standard error	t-value	P-value
Age	0.4790361	0.1674568	-2.11**	0.035**
Gender	3.64549	1.898344	2.48**	0.013**
Marital status	4.592706	2.748414	-1.85	0.17
Level of education	1.426443	0.4291234	1.18	0.238
Household size	1.634	0.3762	2.87**	0.023**
Household income	1.167	0.047	3.850***	0.001***
Access to extension service	1.148	0.340	0.98	0.641
Land Size	1.034	0.013	3.24***	0.004***
Membership in cooperative societies	1.322	0.061	3.14***	0.001***
Distance to credit source	0.532	0.179	1.04	0.313
Livestock ownership	2.425	0.876	-2.84**	0.017**
Asset value	2.181	0.572	2.97***	0.003***
Constant	0.031830	0.0482132	-2.28	0.023

N=100, LR chi2(5) =27.87, Prob>chie2 =0.0000, Pseudo R^2 = 0.2250

*Note *** Significant at 1%; ** Significant at 5%; * Significant at 10%*

Similarly, the study revealed that at the 1% p level of significance (p= 0.001), household size and access to agricultural credit are psotively and significantly related. When a household increases by one member, the likelihood of obtaining agricultural credit rises by 1.634 times.The positive relationship between household size and agricultural loan access could be due to the fact that as household size increases, so makes the demand for household expenditure. The household is more likely to have dependents in the form of children and the elderly, resulting in a higher demand for agricultural credit that could aid in adopting more productivity-enhancing technologies.The study findings corroborate with earlier results from past studies (Moahid&Maharjan, 2020;Saqib*et al.*,2018; Motsoari*et al.*,2015;Wabei 2012, Gandhimathi&Ambigadevi 2014), which reported that household size positively influences access to agricultural credit.

Moreover, the findings revealed a positive and significant association between household income and access to farm credit(P=0.001). As per the findings, a one-unit rise in household income or one Shilling increase in household income is likely to increase access to agricultural credit 1.167 times. The fact that farmers who economically well have an advantage on having a variety of valuable assets recommended for accessing credit, as well as economic strength, leads to more innovative practices to increase farm yields, is most likely to have led to the positive and significant relationship between household income and access to agricultural credit. Poor households are considered high-risk borrowers, so they are only given small loans and are correlated with loan defaults. Similarly, (Moahid&Maharjan,2020; Ullah*et al.*,2020; Oke*et al.*,2019; Saqib*et al.*,

2018; Nwankwo, 2017 &Anang*et al.*,2015) found a positive relationship between household income and agricultural credit access.

Similarly, the study found that having more land increases access to agricultural credit by 1.03 times. Their relationship is positive and statistically significant (p = 0.004) at the 1% significance level. One potential reason is that as the size of the farm increases, more resources are needed to fund farm operations, which leads to a rise in the demand for credit.Furthermore, having a large piece of land as an immovable asset gives a farmer strong social standing when getting credit from nearby non-formal financial institutions. This study's results alignwith those of (Moahid&Maharja,2020;Ullah*et al.*,2020;Oke*et al.*,2019; Saqib*et al.*,2018;Nkwankwo,2017; Chandio*et al.*, 2018;&Ugwumba and Omojola2013).

Cooperative membership is also 1.322 times more likely to affect agricultural credit access in the study field. At the 1% significance level, this relationship is positive and statistically significant (p =0.001).This means that being a member of a cooperative institution increases the chances of getting farm credit. Since the members own these institutions, services are given exclusively to members. Members can save small amounts of money and accumulate funds for potential use, including agricultural activities.Furthermore, members have the power to make decisions about their organization, especially when it comes to formulating regulations and policies, which means there is a better chance of serving members' needs and developing simple loan procedures.This finding corroborate with the previous study (Sodeeq*et al.*,2019;Ogundejji*et al.*,2018;Ijioma& Osandu,2015), which found that a farmer's membership in a cooperative institution increases his or her chances of obtaining credit because cooperative societies encourage members to save and mobilize funds that can be used to receive credit.

Farm credit accessibility is influenced by asset ownership and the value of owned assets by farmers, such as houses, tractors, and lands. The findings show that asset value has a significant and positive impact on agricultural credit access. It implies the asset value is 2.181 times more likely to increase credit availability. The relationship is positive at the 5% significance level (p= 0.035), indicating that the more desirable an asset a farmer owns, the more likely he or she is to obtain credit. The presumption that since a farmer owns valuable assets, these assets can be pledged as collateral to credit institutions may have contributed to the positive relationship. This implies that asset value is 2.181 times more likely to increase the likelihood of access to agricultural credit. The association is positive at a 5% significance level (p= 0.035), which means the more valuable asset possessed by a farmer, the more is likely to access credit. Positive connection possibly contributed by the assumption that as a farmer owns valuable assets, these assets can be pledged as collateral to credit institutions. The findings from this studycorroborate with the results fromearlier studies by(Ullah*et al.*,2020;Hainz&Teksoz 2006)

However, in the study area, the findings revealed that livestock ownership has a significant and negative relationship with access to farm credit at a 5% significance level (p= 0.017). The negative relationship between the need for agricultural credit and livestock ownership is likely due to the fact that livestock-owning households generate additional income from the selling of livestock products, and livestock ownership is often seen as a source of savings in rural communities.As a result, the extrarevenue generated by livestock keeping and sales helps farmers during the farming season. The finding of this study corroborate with the findings of Anang*et al*. (2015), who found that households with cattle have more liquidity than those without cattle.

Similarly, the findings revealed that the age of the respondents in the study area had a statistically significant and negative relationship with access to agricultural credit (p= 0.035), which means that having one more year of birth reduces access to agricultural credit by 0.4790361 compared to being younger. The negative relationship between household head age and agricultural credit access is most likely due to the fact that older smallholder farmers are less likely to receive loans, are less risk-takers, and credit institutions preclude them from resisting loan defaults because they are considered less profitable.The results are consistent with previous studies (Sebopetji and Belete 2009), which found that farmer age has a negative relationship with farm credit access, with access to farm credits decreasing 0.0018% as farmer age increases.

Furthermore, the study results are consistent with those of Michael *et al.*,2018, who found that the household head's age is negatively linked to access to agricultural credit.

4. CONCLUSION AND RECOMMENDATIONS

The study analysed access to agricultural credit among smallholderrice farmers in Shinyanga region. It examined the sources of agricultural farm credit by descriptive statistics and the factors that drive or constraints access to agricultural credit by the logistic regression model. One of the significant agricultural facilities that obstruct smallholder farmers from adopting modern agricultural technologies to enhance their production and productivity in Tanzania is credit access. The results show that the available sources of agricultural credit in the study area wereCommercial Banks, Microfinance institutions, Cooperative Institutions, personal savings, individual money lenders, and Friends/Relatives. Furthermore, the study found that cooperative institutions are the most preferred source of agricultural credit in the study area (33.89%), followed by personal savings (27.22%), individual lenders (17.78 %), relatives/friends (8.89 %), and microfinance institutions (8.33 percent), and commercial banks are the least preferred source of agricultural credit (8.33 %) (3.89%).In terms of determinants of access to agricultural credit, the research reveals that the gender of the household head, household size, household income, membership in a cooperative institution, land size, and asset value all positively affect access to agricultural credit.However, the study findings revealed that access to credit is negatively related to age and livestock ownership when it comes to agricultural credit. The study recommends thatfarmers and cooperative stakeholders focus on forming self-help groups similar to cooperative institutions. In comparison to other sources, this source was found to be consistent in rural areas. Moreover,these institutions are formed locally, are owned and managed by members, offer services only to members who are known to the association, and allow members to make micro-savings that can be used as loan collateral. Since cooperative institutions are established locally and controlled by members, they help to reduce loan transaction costs, simplify loan applications, processing processes, and repayment, and ensure timely credit delivery.

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