International Journal of Agricultural Economics
2023; 8(3): 83-89
http://www.sciencepublishinggroup.com/j/ijae
doi: 10.11648/j.ijae.20230803.11
ISSN: 2575-3851 (Print); ISSN: 2575-3843 (Online)

Factors Influencing Access to Financial Inclusion Among Tomato Smallholders Farmers' in Kilolo District, Iringa

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To cite this article:

Laura Vedasto Ndibalema, Damas Philip. Factors Influencing Access to Financial Inclusion Among Tomato Smallholders Farmers' in Kilolo District, Iringa. *International Journal of Agricultural Economics*. Vol. 8, No. 3, 2023, pp. 83-89. doi: 10.11648/j.ijae.20230803.11

Received: March 6, 2023; **Accepted**: April 1, 2023; **Published**: May 10, 2023

Abstract: Sub-Saharan Africa's smallholder farming structures are primarily distinguished by consistently poor crop productivity levels. Despite smallholder farmers' output being low, Tanzania has spent the last few decades changing its agricultural policy to make financial inclusion more beneficial and accessible to farmers. In this essay, the level of financial inclusion among tomato smallholder farmers in the Kilolo District will be discussed, along with the effectiveness of service provision and factors that contribute to financial inclusion. The current study used a cross-sectional research methodology in which 199 smallholder tomato producers provided data on a standardized questionnaire all at once. Quantitative information on financial services' quality and accessibility was examined using descriptive analysis. Logical multinomial In order to ascertain which level of financial inclusion was most likely for a tomato farmer, regression analysis was conducted. The degree of financial inclusion of tomato smallholder farmers was assessed using multiple response analysis, and the effectiveness of the services provided was assessed using a Likert scale. The findings of financial inclusion showed that more than half of the farmers (58.3%) had access to financial services. According to the study, financial institutions predominately offer savings and money transfer services. Additionally, among tomato smallholder farmers, the degree of financial inclusion was significantly influenced by the household age, sex, educational attainment, and income of the head of the family. It is advised that the government adopt policies that emphasize providing financial services to many rural areas and teaching farmers about the significance of financial inclusion in farming.

Keywords: Government, Financial Inclusion, Tomato Productivity, Smallholder Farmers, Multinomial Logistic Regression

1. Introduction

Agriculture has a crucial role in total human wellness since it provides food for people, money for farmers, raw materials for businesses, and jobs that generate foreign exchange for the country anywhere around the globe. Vegetable production is a critical part of the world agricultural system since it helps ensure the security of food and nutrition as well as the development of money and jobs [19]. In terms of relevant extension and research, smallholder vegetable producers have historically received little attention, and the situation is still the same.

The second-largest commercial vegetable produced worldwide, according to statistics, is tomatoes. China, the United States, Turkey, Egypt, and India were the world's top producers of fresh tomatoes in 2022, growing them on 5 million hectares of land [4]. Most tomato production occurs in the Morogoro region, the southern highlands, and the northern highlands [18]. These regions' respective harvesting seasons are from August through November, July through September, and May through August. Each hectare requires between 124 and 150 man-days of labor. Various nutrients are needed at various tomato plant stages [18].

In general, the productivity of smallholder agricultural techniques is constrained by a lack of access to the best inputs and appropriate technologies due to, among other things, restricted or nonexistent access to money. That is caused by a number of elements, many of which are interconnected: Smallholders generally lack financial literacy, and poorly defined property rights frequently prevent the use of cultivated land as collateral. The cost of borrowing in developing

countries is high, especially when dealing with long-term loans that are more appropriate for capital expenditures [14]. Financial inclusion refers to the breadth, caliber, and accessibility of financial services to the disadvantaged and the financially excluded. The implications of financial inclusion on agriculture are influenced by how money affects inequality and poverty and hence increased agricultural production and greater farmer incomes are results of financial availability [1].

Similar studies argue in favor of the notion that having access to financing is a crucial factor in determining the productivity and expansion of various enterprises, including farming [3]. A study done by Chandio *et al.* (2021) postulated that Pakistan's sugarcane productivity is positively and significantly impacted by agricultural loans from formal financial institutions. Mutayoba and Ngaruko [16] report that the country's tomato production has been dropping and fluctuating in recent years, although it ranks as the 20th largest tomato producer worldwide. Additionally, Msimbe [15] reports that Tanzania produces between 2.2 and 3.3 tons of tomatoes per hectare, far less than the average for the world, which is 27.5 tons per hectare. The extent to which financial inclusion affects tomato output, however, was not determined by these studies. The current study aims to examine major determinants of the degree of financial inclusion, with a focus on the degree of financial inclusion experienced by smallholder tomato growers and the factors influencing these farmers' financial inclusion.

The results of the study should help in understanding how smallholder farmers who grow tomatoes are impacted by financial inclusion. Agricultural development is crucial to accomplishing this goal because more than two billion people globally, especially the poorest; depend on agriculture [5]. The study's findings also provide advice on how to address problems that banks and farmers encounter while attempting to offer and get financial services to smallholder farmers.

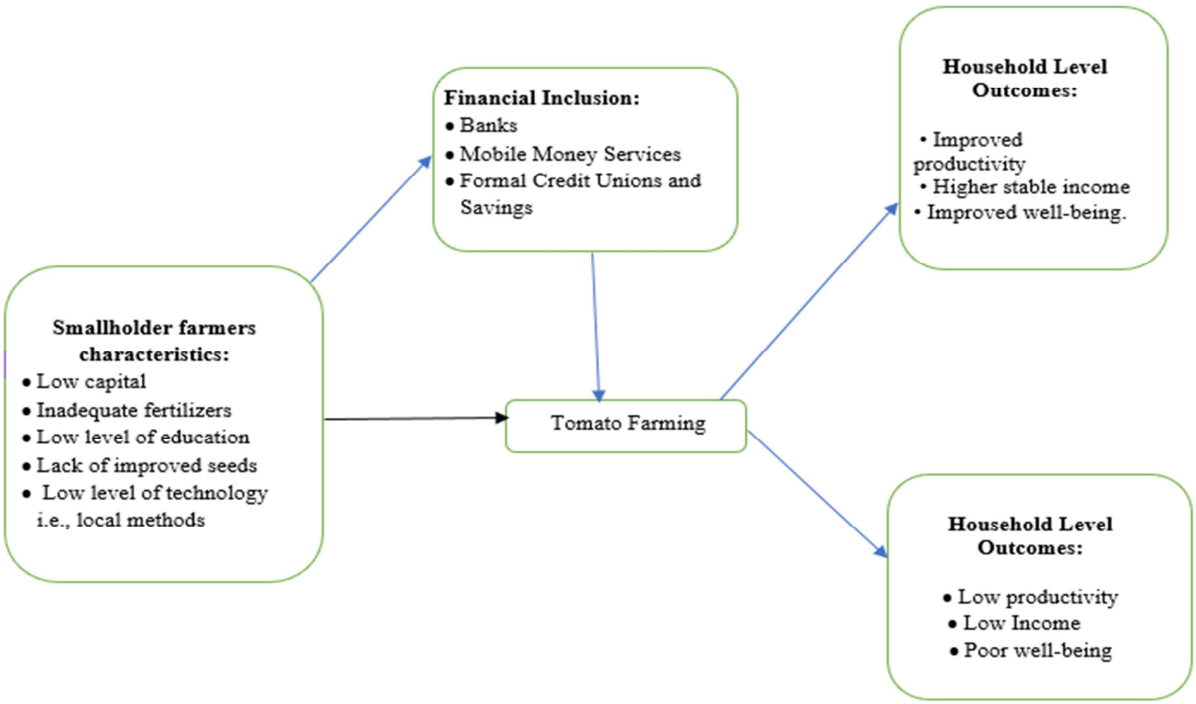
2. Theoretical Framework

Rational Choice Theory

This study is grounded on the "Rational decision theory". The eventual effect of this rational decision is that people, as part of a social system tend to make their own decision on whether to be financially inclusive or not. This suggests that every person is a rational decision-maker trying to maximize utility based on budget limitations, acting in a way that will benefit the most [22]. This research therefore, takes into account that every tomato farmer is considered to be a rational decision-maker. He/she will use formal financial services and products if the value associated with them is greater than the utility associated with not utilizing them. Generally, the theory postulates that smallholder farmers are influenced by several demographic factors for being financially inclusive [13].

3. Conceptual Framework

The conceptual framework shown in Figure 1 is based on various empirical literature reviews undertaken on examples involving financial inclusion and its causes among tomato smallholder farmers. It illustrates different factors which influence smallholder farmers to be able to be financially inclusive and well-being at large due to the financial boost. The focus of this paper specifically is on the effect of smallholder farmers' characteristics and how they affect their financial inclusions.



Source: Modified by Isaga (2018).

Figure 1. *Factor Influencing Financial Inclusion among tomato smallholders' farmers.*

4. Methodology

4.1. The Study Area

The study took place in the Kilolo District of the Iringa Region, which is located in the Southern highlands zone, which extends from 7° to 8.3°S latitude and 34° to 37°E longitude. Agriculture is the region's primary economic activity, as it employs over 80% of the people [5]. Kilolo District was chosen for its tomato-growing potential, as tomatoes are a valuable cash crop in the district.

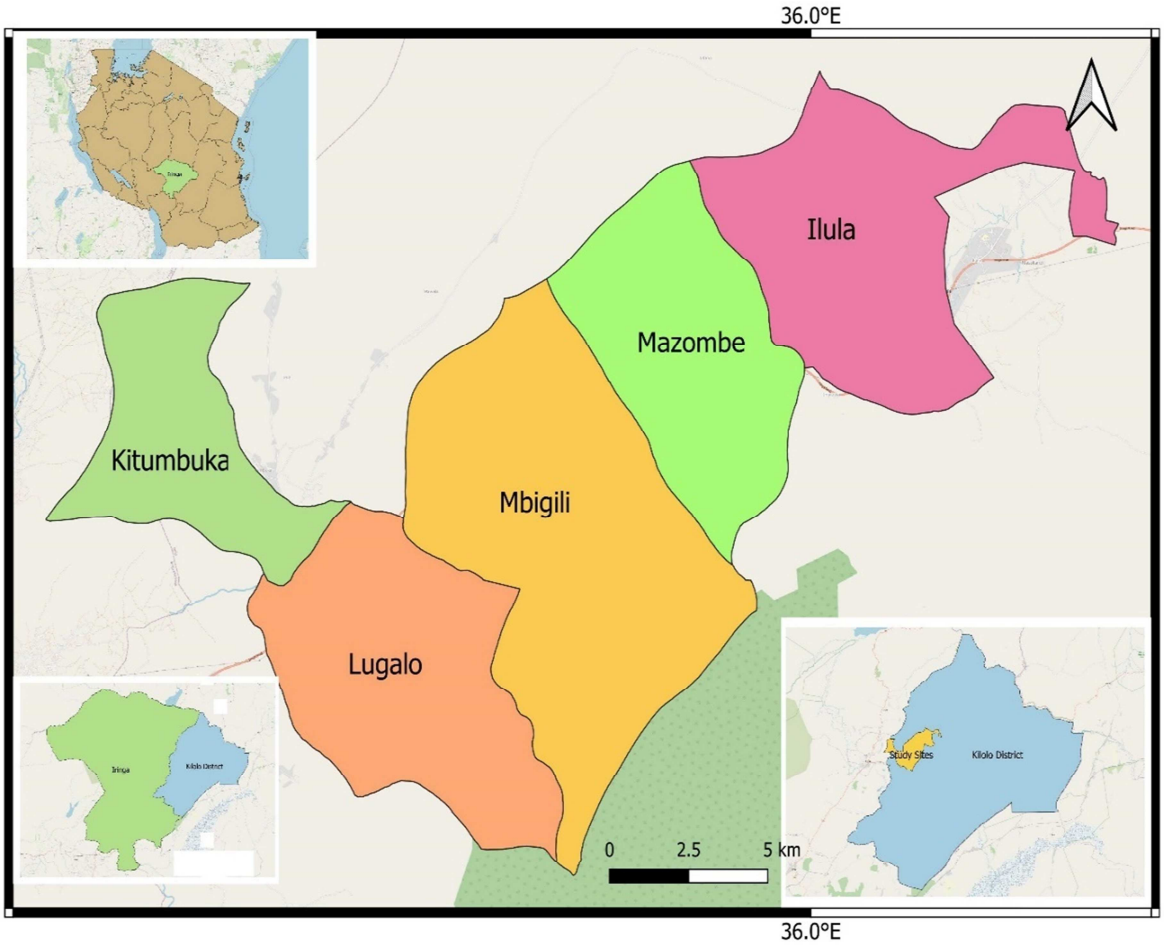


Figure 2. *A Map Showing the Kilolo District and some of its villages.*

4.2. Sampling Procedure and Sample Size

The present study used a cross-sectional design where, data were collected once at a time in the field. A total of 199 smallholder tomato farmers in the Kilolo District were selected to participate in the study. A stratified sampling design was used to group the tomato farmers who are financially and non-financially inclusive. Using basic random sampling, a complete sample was obtained from each stratum in Kilolo District. The sample size was estimated by using the formula proposed by Yamane (1967) which has been presented in equation 1 below;

$$n = \frac{N}{1+Ne^2} \quad (1)$$

Where *N* is the size of the population, n is the sample size and *e* is the precision level.

In this research N=398 with ±5% desired precision (p = 0.05), at 95% confidence level, we get the sample size as:

$$n = \frac{398}{1+398(0.05)^2} = 199$$

4.3. Data Collection

Interviews were conducted using a questionnaire to collect information on the accessibility and quality of financial services.

4.4. Data Analysis

4.4.1. Levels of Financial Inclusion

Descriptive analysis was used to analyze quantitative data on the quality and access of financial services. Quantitative data collected through the questionnaire were analyzed using the Statistical Package for the Social Sciences (SPSS) version

20, whereby both descriptive (frequencies and percentages) statistics were determined. Qualitative data were analyzed using content analysis.

4.4.2. Factors Influencing Access to Financial Inclusion Among Tomato Smallholders Farmers'

To analyze the variables affecting the financial inclusion of smallholder tomato growers, multinomial logistic regression was utilized. The levels of financial inclusion will be the dependent variable in this scenario (bank account, loans, savings, and mobile money). Additionally, respondent factors like age, education, wealth, and sex will make up the independent variable.

5. Findings and Discussion

5.1. Socio-Demographic Profile

In this study, many respondent characteristics were employed. Sex, age, marital status, level of education, primary and secondary occupations, type of home, and size were among the respondent characteristics.

According to Table 1's data, there were 65 female respondents, or nearly 32.7%, compared to 134 male respondents or 67.3%. This implies that most of the tomato growing activities are done by males. This is almost similar to a study by Pamuk et al., [19] that reported that males are more involved in the tomato value chain than females.

Table 1. *Socio-Demographic Profile (n = 199).*

Variables	Categories	Frequency	Percentage (%)
Household sex	Male	134	67.3
	Female	65	32.7
Age	Below 20	1	0.5
	20-29	57	28.6
	30-39	72	36.2
	40-49	33	16.6
	50-59	23	11.6
	60-69	10	5.0
	70+	3	1.5
Marital status	Single	38	19.1
	Married	133	66.8
	Widowed	10	5.0
	Divorced/Separated	18	9.0
Education level	No Formal Education	6	3.0
	Primary Education	78	39.2
	Secondary Education	65	32.7
	Vocational Education	14	7.0
	College Education	23	11.6
	University Education	13	6.5
Major occupation	Farming	112	56.3
	Livestock Keeping	10	5.0
	Employee of Government	30	15.1
	Business	47	23.6

As summarized in Table 1 the respondent aged below 20 was 1 which was almost 0.5%, the respondents aged between 20-29 where 57 was equal to 28.6%, and respondents aged between 30-39 were 72 which was almost 36.2%, and the respondent aged between 40-49 were 33 which is equal to 16.6%, the respondent aged between 50-59 were 23 which is almost 11.6%, the respondent aged between 60-69 were 10 which is almost 5.0% and aged 70 and above were 3 which was almost 1.5%. The results suggest that most reproductive age involved in tomato production was 30-39 years old. This is almost similar to a study done by Masunga [11], who reported that middle age is the one involved in tomato production activities.

In accordance with Table 1's findings, 19.1% of respondents identified as single, 66.8% as married, 5.0% as widowed, and 9.0% as divorced or separated. As a result of their involvement in several social and professional obligations, it is implied that married individuals perform the majority of the activities associated with tomato cultivation. These obligations include providing better housing, food, clothes, and health services as well as ensuring family members have access to food, better housing, better housing conditions, and better housing conditions for children. This is essentially identical to a study by Masunga [11], which found that married individuals are more likely to be engaged in tomato cultivation than unmarried individuals.

Table 1's findings also reveal that 3% of respondents had no formal education, 39.2% had completed their primary education, 32.7% had completed their secondary education, 7.0% had completed their vocational training, 11.6% had completed their college education, and 6.5% had completed their university education. This suggests that the majority of small-scale tomato farmers had a secondary education. The presence of several schools in the study area may have a significant impact on this. The findings are consistent with the study of Masunga [11], which found that literate farmers are encouraged since they are well aware of financial services.

As summarized in Table 1, 56.3% of the respondent's major occupation was farming, 5.0% of the respondents were depending on livestock, 15.1% of the respondents were government employees, and 23.6% of the respondents were businessmen. More than half of the farmers were farmers. This indicates that most of the farmers will be concentrating on tomato farming activities thus they would have the courage to be involved financially inclusive thus raising their production.

5.2. The Level of Financial Inclusion by Tomato Smallholder Farmers in the Kilolo District

5.2.1. Accessibility to Financial Services

Table 2's findings indicate that whereas 40.7% of respondents do not have access to financial services, roughly 58.3% of respondents do. Loans, money transfers, deposits, and money-saving are examples of accessible financial services. The government, mobile money services, VICOBA, SACCOS, and banks (TPB, ABSA, NMB, CRDB, and MUCOBA) all provide services.

Table 2. *Distribution of respondents by access to financial services.*

Response	Frequency	Percent
No	82	40.7
Yes	117	58.3
Total	199	100.0

In accordance with the findings in Table 2, more over half of the farmers had access to financial services. This suggests that there are a lot of financially inclusive tomato farmers. This may be significantly impacted by effective extension services provided to tomato producers in order for them to access various financial services including banks and mobile money services. According to a study by Kaloi et al. [9], extension services provided to smallholder farmers increase their understanding of the benefits of using more financial services during their agricultural production operations.

Also results in Table 3 show that loans and savings are the most dominating means of financial services used by most tomato smallholder farmers. Guadagno et al. [7] note that because different types of financial institutions dominate the market, the majority of them primarily use saving and money transfer services, which makes it challenging for them to obtain loans and fixed deposits. Additionally, most rural areas are not serviced by banks; hence most rural residents use mobile money services. Many Tanzanian rural communities have yet to receive bank services, according to Guadagno et al. [7]. The tiniest sites still offer banking services, and many farmers, the only banking function they use is money saving. With so many procedures and requirements to follow, taking out loans has become difficult, which dissatisfies borrowers [12] leaving few of them with opportunities. Although it was noted during the focus group discussion that they were unaware of bank services, they wished that bankers might visit local communities and provide information about banking-related concerns.

Table 3. *Distribution of respondents by type of financial services used/accessed.*

Financial services available	Frequency	Percent (%)
Loans	11	9.4
Loans; Money transfer	6	5.1
Loans; Saving	14	12
Loans; Saving; Money transfer	10	8.5
Money Transfer	19	16
Saving	16	14
Saving; Money transfer	41	35
Total	117	100.0

5.2.2. Quality of Service Delivery

Customer impressions of the quality of service provided by financial institutions were assessed based on the five factors that influence service quality (tangibility, reliability, responsiveness, assurance, and empathy), with the results shown in Table 4.

(i). Tangibility

According to Table 4's findings, the majority of respondents (34%) were ambivalent toward the statement, while the second group (23%) strongly agreed. Since services are tangible, customers gauge the quality of such services by comparing the tangibles that go along with them [10]. It is the way that the physical infrastructure, tools, people, and communication materials look [6].

(ii). Reliability

According to Table 4's findings, 45% of respondents strongly agreed with the statement, while 28% of them were neutral toward it and none of them disagreed. The conclusion is in line with that of Hossan [8], who said that a corporation is reliable if it fulfills its commitments to customers regarding delivery, service supply, problem resolution, and pricing. Customers want to conduct business with organizations that honor their commitments, especially those related to service results and fundamental service characteristics [2]. The reliability requirements of customers must be understood by all businesses [2]. Businesses who don't offer the essential service those customers believe they are purchasing let down their clients in the most blatant way [8].

(iii). Responsiveness

Finding's in Table 4 shows that most of the respondents strongly agree with the statement (42%) with the second group (30%) of those who agree with the statement. Most of the respondents agreed as they say the service providers have good customer care as their employees quickly respond to the request made and questions. The findings are supported by [6], most of the company are keen to respond to their customer's problems and solve to keep them. In dealing with clients' requests, inquiries, complaints, and difficulties, this dimension emphasizes attention to detail and promptness [6]. The amount of time that customers must wait for assistance, responses to inquiries, or attention to problems communicates responsiveness to them [6]. The idea of flexibility and the capacity to tailor the service to the needs of customers are also captured by responsiveness [2].

(iv). Assurance

The findings (Table 4) demonstrate that the majority of respondents strongly agreed with the statement (52%) with the second group (24%) of those who agree with the statement. Few of the respondents (6%) disagree while none of them strongly disagree. Most respondents support the statement as they say institutions available are confidently trusted. This dimension is likely to be particularly significant for services that customers perceive to have high escalating costs and services they are unsure they can accurately assess [6]. The individual who serves as the company's client liaison, such as the marketing department, may be an embodiment of trust and confidence. Employees understand the value of winning consumers' trust and confidence in order to obtain a competitive edge and win their loyalty [6].

(v). Empathy

Findings in Table 4 shows that most of the respondents strongly agree with the statement (37%) with the second group (32%) of those who agree with the statement. Few respondents (6%) disagree with the statement while no one falls into the strongly disagree group. In some nations, it is crucial to offer personalized service to demonstrate to the client that the business is making every effort to meet his needs [17]. The findings are consistent with those of Ghost and Gnanadhas [6], who claimed that empathy is an additional benefit to winning over customers' trust and confidence while also boosting

loyalty. Customers' demands are increasing daily in this cutthroat marketplace, and businesses must do everything in their power to satisfy them or risk losing business to competitors who give each client their whole attention [17].

Table 4. *Distribution of respondents by responses to attitudinal statement for services quality.*

Attitudinal statement	strongly agree		agree		undecided/neutral		Disagree		strongly disagree	
	N	%	n	%	n	%	n	%	N	%
Tangibility	46	23	44	22	68	34	8	4	33	17
Reliability	90	45	54	27	55	28	0	0	0	0
Responsiveness	84	42	60	30	16	8	35	18	4	2
Assurance	103	52	48	24	36	18	12	6	0	0
Empathy	74	37	63	32	50	25	12	6	0	0

5.3. Factors Influencing Access to Financial Inclusion Among Tomato Smallholders Farmers'

To identify the variables affecting financial inclusion, a multinomial logistic regression model was applied. The age of the household, level of education, gender of the respondent, income level, and employment status were all explanatory variables. Table 4's findings demonstrate that the Wald statistic for bank accounts, savings accounts, mobile money accounts, and loans, respectively, was 0.001, 0.071, 0.017, and 0.042. With Pseudo R^2 values of 0.6935, 0.7213, 0.812, and 0.5781, the included variables may each account for around 69%, 72%, 81%, and 57% of the changes in the likelihood that a farmer will have access to a bank account, savings, mobile money, and loans, respectively.

Table 5. *Factors influencing access to financial inclusion among tomato smallholders' farmers'.*

Variables	Bank deposits	Savings	Mobile money	Loans
Age	0.261	0.077	0.131	0.053
Education level	.079	0.08	0.133	0.1921
Sex	0.083	0.133	-0.161	0.874
Income	0.035	0.038	0.021	0.024
Observation	117	117	117	117
Pseudo R^2	0.694	0.721	0.812	0.578
Wald chi^2 (Prob)	.000	.071	1.742	.050

The findings in Table 5, indicate that the likelihood that a respondent has a bank account, savings, mobile money, and savings were 26.1%, 7.7%, 13.1%, and 5.3%. The findings demonstrate that the household's age was statistically significant and had a positive coefficient, demonstrating a positive correlation between age and smallholder tomato producers' access to financial inclusion. The results are in line with those of Urgessa [20], who discovered that the household head's age has an effect on how financially inclusive small-scale tomato growers are since older household heads tend to have more knowledge of agricultural finance issues due to their greater farm experience. Results from Awunyo [2], who noted that age had little bearing on a farmer's access to financial services (P>0.05).

The likelihood that a respondent had a bank account, a loan, mobile money, and savings depended on education level and was 7.9%, 8%, 13.33%, and 19.21%, respectively. This means that the likelihood of using financial services increases with education. For educated people as opposed to illiterates, proper thinking may have a significant impact on this.

Masunga [11] reported that the issue of farmers being financially inclusive may not be influenced by their level of education but rather the result of perfect access to information regarding correct procedures and use of various financial sources to raise tomato production activities. That report backs up this conclusion. In contrast to Mpeku and Urassa's findings [14], Urassa [21] found that farmers with higher levels of education had a higher likelihood of having access to financial services than their less-educated colleagues.

Except for mobile money services, the respondents' sex was also favorable for all forms of financial inclusion. The chance of increasing use and access for bank accounts, savings accounts, and loans is observed to increase by 8.3%, 13.3%, and 7.2%, respectively, depending on the respondents' sex. The outcomes of this study support those of Zins & Weill's earlier research [21].

The income of the respondent has a significant effect on financial inclusion. According to the results, there was a 3.5%, 3.8%, 2.1%, and 2.4% chance that a responder had a bank account, savings, mobile money, and loan, respectively. As a result, persons with low salaries had fewer odds than those with higher incomes of being financially included. The results are in line with a research by Pamuk *et al.* [19], discovered that households with higher incomes tend to use financial services more frequently than households with lower incomes, which increases those households' productivity.

6. Conclusions and Recommendations

6.1. Conclusion

The study finds that, among tomato smallholder farmers, age, education level, sex, and income had a significant impact on financial inclusion ($p < 0.05$).

According to the findings for the second objective, 58.3% of respondents typically have access to financial services, compared to 40.7% of those who did not. Some of the specified financial services are loans, deposits, money transfers, and money savings.

6.2. Recommendations

From the findings the gives the following recommendations;

i. To ensure that a large number of people can obtain loans for their individual growth, financial institutions, notably banks, should relax their loan requirements.
ii. It is important to put into practice the policies that place a high priority on providing high-quality financial services to various rural areas.
iii. Financial institutions should look at an applicant's level of education, age, income, and place of residence because these are the factors that are thought to have the biggest influence on a tomato grower's capacity to access financial inclusion.

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