# MICROFINANCE LOAN ACCESSIBILITY ON MAIZE PRODUCTION PROJECT PERFORMANCE IN FARMERS' COOPERATIVE IN RWANDA

**Emmanuel Uzabakiriho**[i]
University of Kigali,
Kigali, Rwanda

**Abstract:**

This study examined the effect of microfinance loan accessibility on maize production project performance in farmers' cooperatives. A case of COOPAMA in Nyagatare district, Rwanda. The study used descriptive statistics and inferential statistics, both qualitative and quantitative were used to analyze the data with the assistance of SPSS software program version 25.0 descriptive statistics and inferential statistics were used to present frequencies tables, percentages, mean and standard deviation, and inferential analysis was used to use Pearson correlation and multiple regression model to test the relationship between the independent variables and dependent variable. The study used Production Theory, Game Theory of Microfinance, Adverse Selection, and Moral Hazard Theory. The effect of loan contracts for credit demand, the perceptions of loan borrowing, and the effect of the credit administration process of farmers on maize production project performance in farmers were 3.91; 4.04; and 4.07 respectively. The data of project performance was analyzed; the overall means of results was 4.14. The relationship between microfinance loan accessibility on maize production project performance in farmers' cooperatives between loan contract, loan borrowing, and credit administration and project performance was 0.618, 0.6430, and 0.745 respectively, and the results presented that the variables were statistically significant with p value=0.000b. The results presented the variables of microfinance loan accessibility, the results credit administration process and loan contract were statistically significant with p value=0.000b, and p value=0.283b respectively and the loan borrowing was not statistically significant with p value=0.957b. It concluded that there was a significant relationship between microfinance loan accessibility and project performance.

**JEL**: O16, Q12, Q14, C12, G21

**Keywords:** cooperative, loan accessibility, maize productivity, microfinance, project management

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[i] Correspondence: email uzabem@gmail.com

## 1. Introduction

Agriculture is essential in the economic sector, which contributes up to 30% of the GDP and it was seen to be less developed countries (LDCs) (FAO & IFAD, 2012). More agricultural sector meets big challenges. Some challenges are adaptation to climate change and food security. Agriculture feed hundreds of millions in the future by using scarce resources efficiently and providing environmental services. In LDCs, the livelihoods of almost three-quarters of the population depend on agricultural operations, a significant improvement in the access of farmers to technology, markets, information, and credits, the agricultural sector will not be able to adapt production systems and cope with the challenges it is facing (FAO, 2016). In the past years, conventional banks and microfinance institutions have encouraged access to credit in order to increase farmers' adoption of innovative practices (Djato et al., 2016).

Agriculture credit is important to support farmers in rural areas ranging from short-term loans, medium-term loans, long-term loans, leasing, crop and livestock insurance through formal and informal credit institutions as well as financial arrangements within the agricultural value chain (Chaifetz et al., 2017). Some researchers also argued that the agriculture sector served as a critical driver of wealth creation, employment creation, and economic growth as a means of poverty reduction and provision of food security for the national economy (Sekabira et al., 2019). Studies observed that the rapid growth of the continent of Asia is about the new economic industrialization, which has a direct relationship with the significant growth of the agricultural sector (Deng et al., 2019). Major identified causes of low adoption rates include supply-side constraints such as imperfect information and credit markets (Shiferaw et al., 2019).

Microfinance contribution has made a significant impact on income, savings, expenditure, and asset accumulation, as well as non-financial outcomes, including health, nutrition, food security, education, women's empowerment, and job creation (Rooyen et al., 2012). It is estimated that only 5% of the farmers in Africa and about 15% in Asia and Latin America have had access to formal credit. On average, across developing countries, 5% of the borrowers have received 80% of the loan (Bali, 2001). Many studies have discussed factors that impede the farmer's access to agricultural credit. Most of these studies focus on agrarian credit borrowers. These researchers mostly draw their attention to household characteristics, asset ownership, and regional characteristics (Angang et al., 2016). One key factor missing from the theory is the sources of microfinance capital and access to credit. Those studies that slightly touch on microfinance capital sources link their studies on financial sustainability, self-sufficiency, and outreach (Fehr et al., 2017). It is essential to assess access to credit from both providers' and customers perspective' thoroughly. As a better means to inform policymakers and close the knowledge gap, this present study seeks to establish the microfinance capital sources' effect on Rwanda farmers' access to microfinance credit. Besides, the major studies conducted in Ghana limited their sample to the same region or district, as in (Anang et al., 2016) Maize (Zea

mays) is the essential food and source of nutrients worldwide and it is consumed in different traditional food preparation (FAO, 2020). The consumption of maize will increase, and it is an important food crop for farmers this condition puts maize in major crops in the country and it is ranked second to sorghum among the important cereals and third in all crops, the maize crop covers 100,000 hectares, which means 10% of the total cultivation land and is grown in all country's ecologies with an average of production 1.46 tons per hectare (NISR, 2019)

In developed economies maize is mostly used as a livestock feed crop with a varied role as an industrial and energy crop with economic development including income growth and urbanization, the consumption of animal source foods is accelerating and propelling the demand for maize as feed, maize thereby plays a diverse and dynamic role in global agri-food systems and food nutrition (Erenstein et al., 2022).

In Rwanda, the major food staples are maize, rice and cassava. These are followed by wheat, sorghum, and potatoes (MINAGRI, 2007). The smallholder's subsector cultivates most of the land and produces most of the food crops. This subsector is characterized by small land holdings. Maize is also the most informally traded staple commodity in Rwanda and outside, and in particular between Uganda and Tanzania, (Anang et al., 2016). Approximately, half of the maize in Rwanda is produced in the East Province and about 60 percent of the maize is sold through manufacturing industries in Rwanda (MINAGRI, 2007).

The main goal of agricultural crop management in a country is to guarantee food resources for its population. At the global level, the challenge is to feed about 7 billion people, a number which will most likely double by the year 2050 (Bucagu et al., 2020). Food security requires coordinated action from a cross-section of stakeholders in the food production chain. Governments in collaboration with various stakeholders are investing constant efforts to ensure current human needs and preserve land quality for future generations. According to the national seed policy, the government through the Ministry of Agriculture intends to encourage the stakeholders in maize production and the performance of cooperatives (MINAGRI, 2007).

It will gradually withdraw from this trend and focus its efforts on coordination, regulation, quality control, and other key activities such as agriculture services delivery that cannot be carried out by the stakeholder. This research will help to understand the level of stakeholder facilitation that can lead to the performance of maize farmers' cooperatives availability and sustainable increase of maize productivity.

## 2. Literature review

### 2.1 Cooperatives in Rwanda
Cooperatives are regarded as a way to support farmers, particularly subsistence producers, in achieving well-being and reducing poverty for the members as well as societal goals (RCA, 2011), Stakeholders agriculture cooperatives were found to play significant social economic contributions in many countries, through employment

creation and providing income, produce and supply safe and quality food and services to their members, promoting solidarity and tolerance and promote the rights of each individual's, cooperatives have consider to be one of the good channels of developing rural people in order to overcome poverty, improve living standards and foster development (RCA, 2022).

According to Ngayizeye and Mumene (2022), the effect of stakeholders on the performance of maize farmer's cooperatives in development is threefold, economic, social, and political. Furthermore, posited that cooperatives are able to promote economic and social development, through the provision of agricultural credit, input supply, agricultural processing, agriculture infrastructure, storage and warehousing, market information, extension services, education and training, agricultural implements, and equipment.

According to Vishwanatha and Mutualize (2017), agriculture is the main activity of farmers who are usually living in rural areas. Microcredit programmers have a positive impact on agricultural productivity, household's participants in microcredit programmers have increased the standard of living and reduced unemployment The supply of credit helps rural households to invest in agricultural production and to enhance their off-farm. The contribution of stakeholders in agricultural farmers cooperatives are considered to be the most important organizations that pay attention and try to support the rural development in general and the agricultural development in special through the activities and services achieved for the sake of farmers.

In Rwanda after the 1994 genocide, the microfinance sectors have shown dramatic progress through the support of international and non-governmental organizations with the aim of poverty eradication and socio-economic development of poor communities (Mutamuliza et al., 2022). The microfinance sector in Rwanda contributes significantly to the provision of basic financial services, where about 80 percent of the households holding an account in a financial institution are serviced by the People's Bank network, a microfinance organization, it is envisaged that microfinance would help to generate employment and to diversify sources of income and productivity, thereby contributing to the improvement of Rwanda's economy in a sustainable manner (Mutamuliza et al., 2022).

The microfinance industry in Rwanda has evolved over the years to support those who have for a long time been excluded by traditional commercial banks. Despite the increasingly important contribution assigned to microfinance in poverty reduction in Rwanda (Mutamuliza and Vishwanatha, 2016).

## 3. Loan accessibility

### 3.1 Loan contracts

Loan contractual arrangements involve considerable finance to boost production and support the supply of basic inputs such as seed fertilizer. Firms may also provide land preparation, field cultivation, and harvesting as well as free training and extension

(Martin, 2012). According to Martin (2012), contract farming is a contractual arrangement for a fixed term between a microfinance loan and a farmer and a firm, agricultural loan is needed not only for improving the conditions of the farm environment, enhance the standard of living of the farm families and promote development but also to increase farm outputs (Stone et al., 2011).

## 3.2 Loan borrowing

Agricultural loans are capital needed to finance other factors of production, which include land, labour, and management. Farm loans may be obtained from formal or informal sources (Luka et al., 2022). The banking sector outreach also referred to as the proximity or distance to credit sources and the purpose of the loan have also been cited among the most important determinants considered by banks when granting a loan to all types of businesses. Furthermore, households are discouraged from borrowing from the credit sector if it is distantly located. The researcher found that proximity affects borrowers' costs because both temporal and monetary costs of transactions, especially transportation costs, increase with lender-borrower distance which raises the effective cost of borrowing at otherwise relatively lower interest rate in the sector (Luka et al., 2022).

According to Babajide, (2011) due to the size of the loan and lack of information on rates of return, which come in the form of high interest rates and high cost of capital. However, borrowers usually prefer to borrow from institutions where the interest rate is low as higher interest rates result in a burden of paying high-interest expenses and may sometimes cause a default on repayment of the loan by farmers, this in turn soils their credit history when demanding further borrowings. Thus, it was expected that higher interest rates negatively affect farmers' access to bank credit.

## 3.3 Loan administration process

Farmers' Cooperatives are one of the vital channels through which loans can be administered to the beneficiaries for efficient loan repayment because of inherent saving mobilization and thrift culture coupled with good corporate governance. The importance of loans to the farmers, whether large, medium, small or micro-agro-entrepreneurs need not be over-flogged as remarked by (Enimu et al., 2017). The major purpose for which loan was provided to farmers was basically to help them expand their farm activities; and increase output and income levels. This discovery aligns closely with the obtained results by Martin (2010) that microcredit gives the purpose of business establishment, and expansion and ultimately reduces poverty and creates wealth. Probing further, the credit explains that farmers dominate in the areas where they operate and also form the majority of poor households.

## 3.4 Project performance

Performance generally is controlled by measuring factors such as profitability, sales, market share, shareholder value, employee productivity, and customer satisfaction.

Although variables are analyzed, managers usually consider several standards simultaneously that combine to provide an overall measure of performance. Even though the most common variables that are used to represent an organization's performance are quantitative) e.g., net profit return on equity), many qualitative measures (e.g., customer satisfaction, attitude change towards the company or its products) are also considered in an overall assessment of performance. For example, a firm might consider the efficiency of its operation based on cost containment and contribution margins and the productivity of its personnel who make goods in the factory, salespeople who call on the company's customers, or the rate of new product introduction into the market. Qualitative factors that are more elusive and hence more subjective help management gain a better understanding of overall performance. For example, customer satisfaction, product quality (as it is perceived by the customer), and return on investment in advertising can be combined with quantitative factors in measuring performance (Feyisa, 2016).

Rwanda is classified as a developing country and the majority of Rwandans depend on small-scale subsistence agriculture for their livelihoods (NISR, 2019). They cannot gather enough capital to purchase the necessary inputs. This coupled with other challenges has negatively affected maize farmers' cooperation and productivity in Rwanda.

This is a problem of great concern in considering the contribution of stakeholders to the cooperative performance and the economy in general. These small-scale farmers, who are the majority of the population, face numerous challenges among which are inadequate education which precludes access to markets or bargaining on prices, soil erosion which sweeps away both fertile soil and planted crops during the rainy season, and lack of mechanization and irrigation which leaves farmers reliant only on rainfall (Gbadebo et al., 2013). In addition, high population density inversely reduces land per household which in turn reduces agricultural production (Mbanza, 2013) and Venugopal (2016) found that cooperatives were characterized by a lack of marketing facilities, a lack of land, poor road infrastructural problems, and the prevalence of diseases that influenced farmer's market performances, as well as traders' businesses, which were characterized by a lack of road, lack of transportation. Many agricultural cooperatives in developing countries have difficulties because they are organized top-down by external entities to promote public investment in rural development initiatives rather than being driven by farmers themselves (Ruben and Heras, 2012). A report by the FAO in 2020 indicated that maize is the main food in African countries developed to reduce food insecurity and poverty in many African countries, where yield was lowest in Africa with around 2 t/ha in 2020 compared to the yield in Asia which was 5.5 t/ha in 2020, the most maize producer countries worldwide are united states of America, chine and Brazil, and while Nigeria is the largest producer of maize in Africa with over 33 million tons, followed by South Africa, Egypt, and Ethiopia (FAO, 2020).

Moreover, Wakilur et al. (2011) also came up with evidence of a strong positive correlation between agricultural credit at reasonable cost and agricultural production. There are quite a lot of scientific papers and reports suggesting that the lack of access to

credits by farmers has unfavorable effects on the agriculture subsector. Credit affects agricultural performance by relaxing the working capital constraints, inducing farmers to adopt the new modern technologies, and the intensive use of fixed resources (Deininger and Duponchel, 2014).

In addition to the above, different research investigated the impact of microfinance loan accessibility on the performance of maize production projects within farmers' cooperatives, concentrating specifically on maize production performance. However, there is a noticeable deficiency in existing research regarding microfinance loan accessibility and its influence on maize production project performance within farmers' cooperatives. Consequently, this study will contribute to addressing and bridging this gap in the literature.

Thus, a study investigating the effect of microfinance loan accessibility on maize production project performance in farmers' cooperatives in Rwanda with the following research objectives:

1) To find out the effect of loan contracts for credit demand of farmers on maize production project performance in farmers' COOPAMA cooperative in Nyagatare district.
2) To assess the perceptions of loan borrowing for farmers on maize production project performance in farmers' COOPAMA cooperative in Nyagatare district.
3) To assess the effect of the credit administration process on maize production project performance in farmers' COOPAMA cooperative in Nyagatare district.

## 4. Methodology

The study investigating the effect of microfinance loan accessibility on maize production project performance in farmers' cooperatives in Rwanda employed a quantitative research approach through descriptive and correlation analyses. It was conducted in Nyagatare district with a case study of the COOPAMA cooperative. The use of correlational and regression analyses research design was taken to find out for the sake of exercising the relationship between variables, the goal of correlation research was used to determine the relationship between variables and the extent to which is the relationship (Pallant, 2001).

The target population was 165 (made of 10 board members and 155 active members) a number that led to the adoption of census inquiry, rather than sampling from the population. This was based on the suggestion that if the target population is smaller (e.g. 300 or less) census inquiry was the suitable and effective methodology to achieve a needed level of accuracy. Thus, the sampling size of the research study adopted census inquiry was suitable and effective in achieving the needed precision in terms of population (Creswell, 2012).

## 4.1 Procedure for data collection

The procedure followed was that a researcher got a letter from University of Kigali in the office of the dean of graduate school to authorize a research to go ahead with the data collection process, and a researcher represented a letter to the head of human resource & administration of COOPAMA Cooperative for acceptance and be granted a permission to collect data, the permission was granted to the researcher, the researcher proceeded and approached the respondents, questionnaires were distributed and requested for interviews.

## 4.2 Data collection methods and instruments

The research relied on both primary and secondary data collection methods in collecting firsthand and second-hand information. In this case, questionnaires and interviews were used for primary data, and documentary reviews used internet services for secondary data, the researcher considered and relied on primary and secondary data to collect primary data as raw data for the first instance and secondary data from the second information. The questionnaire of a five-point Likert scale was piloted and checked for validity and reliability before approval.

## 4.3 Data analysis

To analyse data, we employed descriptive, correlation, and regression analyses as follows:

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

Where:
Y = project performance;
$\beta_0$ = constant;
$\beta_1, \beta_2, \beta_3, \beta_4$ = regression coefficients;
$X_1$ = loan contracts;
$X_2$ = loan borrowing;
$X_3$ = credit administration process;
$\varepsilon$ = error term.

## 5. Findings

### 5.1 The effect of loan contracts for credit demand of farmers on maize production project performance in farmers' COOPAMA cooperative in Nyagatare district

Table 1 shows the results of the effect of loan contracts for credit demand of farmers on maize production project performance in farmers' COOPAMA cooperative in Nyagatare district. The data was analyzed, and out of 165 respondents, whether there, is any microfinance intervention in linking cooperatives to have access to market information, a significant proportion of respondents 54(32.70%) agree, and 4(26.70%) strongly agree.

**Table 1:** The effect of loan contracts on credit demand
of farmers on maize production project performance

| | Strongly disagree | Disagree | Neutral | Agree | Strongly agree | Mean | Standard deviation |
|---|---|---|---|---|---|---|---|
| | n(%) | n(%) | n(%) | n(%) | n(%) | M | SD |
| Is any microfinance intervention in linking cooperatives to have access to market information? | 10(6.1) | 20(12.1) | 37(22.4) | 54(32.7) | 44(26.7) | 3.62 | 1.17 |
| Does COOPAMA undergo cash flow analysis? | 7(4.2) | 8(4.8) | 22(13.3) | 93(56.4) | 35(21.2) | 3.85 | 0.95 |
| Is it important to let people know what you are doing in COOPAMA Cooperative? | 5(3.0) | 8(4.8) | 14(8.5) | 93(56.4) | 45(27.3) | 4.00 | 0.91 |
| Are there barriers that the cooperative overcomes during service delivery? | 7(4.2) | 5(3.0) | 8(4.8) | 90(54.5) | 55(33.3) | 4.10 | 0.93 |
| Is there any need for caring for the service user where appropriate to satisfy customers? | 6(3.6) | 7(4.2) | 21(12.7) | 78(47.3) | 53(32.1) | 4.00 | 0.97 |
| Overall Mean | | | | | | 3.91 | |

There was an effect of loan contracts for credit demand of farmers on maize production project performance in farmers' COOPAMA cooperative in Nyagatare district (mean=3.62 which is high, SD=1.176). On there, does COOPAMA undergo cash flow analysis, a percentage of respondents 93(56.4%) agree, and 35(21.20%) strongly agree, it is evidenced that there was COOPAMA undergo cashflow analysis (mean=3.85 which is high, SD=0.95 more heterogeneous). On there, is it important to let people know what you are doing in COOPAMA Cooperative, 93(56.40%) agree, 45(27.30%) strongly agree. There, it was important to let people know what you are doing in COOPAMA (mean=4.00 which is high, SD=0.911). On there were barriers that the cooperative overcomes during service delivery, 90(54.5%) agree, 55(33.3%) strongly agree. There were barriers that cooperative overcame during service delivery (mean=4.10 which is high, SD= 0.93 more heterogeneous). There was no need for caring for the service user where appropriate to satisfy customers, 78(47.3%) agree, 53(32.1%). There was a need for caring for the service user where appropriate to satisfy customers (mean=4.00 which is high, SD=0.97 more heterogenous). The overall means of results was 3.91 which is between agree and strongly agree it presents that there was the effect of loan contracts for credit demand of farmers on maize production project performance in farmers' COOPAMA cooperative in Nyagatare district.

## 5.2 The perceptions of loan borrowing for farmers on maize production project performance in farmers' COOPAMA cooperative in Nyagatare district

The second analyzed objective was to examine the effect perceptions of loan borrowing for farmers on maize production project performance in farmers' COOPAMA cooperative in Nyagatare district as detailed in the table below:

**Table 2:** The perceptions of loan borrowing
for farmers on maize production project performance

| | Strongly disagree | Disagree | Neutral | Agree | Strongly agree | Mean | Standard deviation |
|---|---|---|---|---|---|---|---|
| | n(%) | n(%) | n(%) | n(%) | n(%) | M | SD |
| There is access to loan/credit services for every farmer in the cooperative. | 3(1.8) | 10(6.1) | 21(12.7) | 76(46.1) | 55(33.3) | 4.03 | 0.93 |
| The amount of credit you get from cooperatives is enough to ensure you gain the expected maize yield. | 5(3.0) | 13(7.9) | 25(15.2) | 79(47.9) | 43(26.1) | 3.86 | 0.99 |
| Do you think the absence of credit access affects better maize production attainment? | 3(1.8) | 4(2.4) | 17(10.3) | 79(47.9) | 62(37.6) | 4.03 | 0.978 |
| Does microfinance make it easy to issue a personal loan when a borrower is a member of a cooperative? | 5(3.8) | 8(4.8) | 9(5.5) | 85(51.5) | 58(35.2) | 4.17 | 0.846 |
| Does savings in microfinance increase the chances of gaining a loan? | 5(3.0) | 6(43.6) | 9(5.5) | 81(49.1) | 63(38.2) | 4.11 | 0.931 |
| **Overall Mean** | | | | | | **4.04** | |

Table 2 shows the results of the effect of perceptions of loan borrowing for farmers on maize production project performance in farmers' COOPAMA Cooperative in Nyagatare district. The data was analyzed, out of 165 respondents, on there is There is access to loan/credit service for every farmer in the cooperative A significant proportion of respondents 76(46.1%) agree, and 55(33.3%) strongly agree. There was, there is access to loan/credit service for every farmer in the cooperative (mean=4.03 which is high, SD=0.933). On there, the amount of credit you get from cooperatives is enough to ensure you gain expected maize yield, 79(47.9%) agree and 43(26.1%) strongly agree. On there the amount of credit you get from cooperatives is enough to ensure you gain the expected maize yield (mean=3.86 which is high, SD=0.993 more heterogeneous). On Do you think the absence of credit access affects better maize production attainment, 79(47.9) agreed

and 62(37.6) strongly agreed that credit access was absent affects better maize production attainment (mean=4.03 which is high, SD=0.978). Does microfinance make it easy to issue a personal loan when a borrower is a member of a cooperative, 85(51.5%) agree, and 58(35.2) strongly that there was microfinance makes it easy to issue a personal loan when a borrower is a member of cooperative, (mean=4.17 which is high, SD=0.846 more heterogeneous). Moreover, 81(49.1%) agree and 63(38.2%) strongly agree that savings in microfinance increases the chances of gaining the loan (mean=4.11 which is high, SD= 0.931 more heterogeneous). The overall means of results was 4.04 which is between Agree and Strongly Agree it presents that there was an effect perception of loan borrowing for farmers on maize production project performance in farmers' COOPAMA cooperative in Nyagatare district.

## 5.3 The effect of credit administration process on maize production project performance in farmers' COOPAMA cooperative in Nyagatare district

Assessing the effect of credit administration process on maize production project performance in farmers' COOPAMA cooperative in Nyagatare district.

The detailed results are presented in the table as follows:

**Table 3:** The effect of credit administration process on maize production project performance

| | Strongly disagree | Disagree | Neutral | Agree | Strongly agree | Mean | Standard Deviation |
|---|---|---|---|---|---|---|---|
| | n(%) | n(%) | n(%) | n(%) | n(%) | M | SD |
| Do farmers in cooperatives achieve the agriculture finances? | 3(1.8) | 12(7.3) | 21(12.7) | 66(40.0) | 63(38.2) | 4.05 | 0.98 |
| There is an adequate maize price to enable you to access a loan. | 4(2.4) | 6(3.6) | 25(15.2) | 70(42.4) | 59(35.8) | 4.06 | 0.93 |
| Does microfinance issue loans to cooperative members through income equality? | 3(1.8) | 12(7.3) | 14(8.5) | 87(52.7) | 49(29.7) | 4.01 | 0.91 |
| Do cooperatives set the selling price of maize? | 2(1.2) | 8(4.8) | 15(9.1) | 75(45.5) | 65(39.4) | 4.17 | 0.87 |
| Is there education gained through cooperative training service to their members? | 2(1.2) | 9(5.5) | 15(9.1) | 78(47.3) | 61(37.0) | 4.13 | 0.88 |
| The current price of maize affects your performance in the cooperative as a member. | 7(4.2) | 11(6.7) | 11(6.7) | 74(44.8) | 62(37.6) | 4.05 | 0.98 |
| **Overall Mean** | | | | | | **4.07** | |

As shown in Table 3, the results of the effect of the effect of credit administration process on maize production project performance in farmers' COOPAMA cooperative in Nyagatare district. The data was analyzed, out of 165 respondents, on there, do farmers in cooperative achieve agricultural finances A significant proportion of respondents 66(40.0%) agree, and 63(38.2%) strongly agree. There were, farmers in the cooperative who do achieve agriculture finances (mean=4.05 which is high, SD=0.98). On there, there is an adequate maize price to enable you access loan, 70(42.4%) agree and 59(35.8%) strongly agree that there was an adequate maize price to enable you access loan, (mean=4.06 which is high, SD=0.93 more heterogeneous). On there, does microfinance issue loans to cooperative members through income equality, 87(52.7%) agree, 49(29.7%) strongly agree that there was an adequate maize price to enable you access loan (mean=4.01 which is high, SD=0.91). On there, Do cooperatives set the selling price of maize, 75(45.5) agreed and 65(39.4) strongly agreed that there were cooperatives set the selling price of maize (mean=4.17 which is high, SD= 0.87 more heterogeneous). On there, Is there education gained through cooperative training service to their members, 78(47.3%) agreed and 61(37.0%)strongly agreed that there was education gained through cooperative training service to their members (mean=4.17 which is high, SD= 0.88 more heterogeneous). The overall means of results was 4.07 which is between agree and strongly agree it presents that there was an effect of the credit administration process on maize production project performance in farmers' COOPAMA cooperative in Nyagatare district.

## 5.4 Project performance in farmers' cooperative

Table 4 presents data on the project performance in farmers' cooperatives, and the results indicate that the scope of cooperative farming practices is enough to ensure the attainment of production after harvests in every season, 74(44.8) agreed and 59(35.8) strongly agreed that there was scope of cooperative farming practices enough to ensure attainment of production after harvests in every season (mean=4.01 which is high, SD=1.04 more homogeneous). Furthermore, 69(41.8) agreed and 70(42.4) strongly agreed that there was good timing of planting maize, positively affects the productivity after harvesting regardless of the season (mean=4.18 which is high, SD=0.92). The findings also indicate that 66(40.0%) and 72(4.3.6%) strongly agreed that there were cooperatives give agricultural input services to their member in order to maintain the homogeneous quality seed (mean=4.14 which is high, SD=1.02). On there, does credit services improve the quality of overall cooperative performance, 62(37.6%) strongly agreed that there were credit services improve the quality of overall cooperative performance (mean=4.19 which is high, SD=1.03 more homogeneous). On there, Do farmers have access to agricultural inputs to ensure COOPAMA achieve high production, 73(44.2%) agreed and 70(42.4%) strongly agreed that there were Farmers have access to agricultural inputs to ensure COOPAMA achieve high production (mean=4.18 which is high, SD=0.95 more homogeneous). The overall means of results was 4.07 which is between agree and strongly agree it presents that there was project performance in the farmers' cooperative.

**Table 4:** Project performance in farmers' cooperative

| | Strongly disagree | Disagree | Neutral | Agree | Strongly agree | Mean | Standard deviation |
|---|---|---|---|---|---|---|---|
| | n(%) | n(%) | n(%) | n(%) | n(%) | M | SD |
| Is the scope of cooperative farming practices enough to ensure the attainment of production after harvests in every season? | 6(3.6) | 13(7.9) | 13(7.9) | 74(44.8) | 59(35.8) | 4.01 | 1.04 |
| Does good timing of planting of maize, positively affect the productivity after harvesting regardless of the season? | 4(2.4) | 6(3.6) | 16(9.7) | 69(41.8) | 70(42.4) | 4.18 | 0.92 |
| Does the cooperative give agricultural input services to their member to maintain the homogeneous quality seed? | 5(3.0) | 12(7.3) | 10(6.1) | 66(40.0) | 72(4.3.6) | 4.14 | 1.02 |
| Does credit services improve quality overall cooperative performance? | 7(4.2) | 8(4.8) | 10(6.1) | 62(37.6) | 78(47.3) | 4.19 | 1.03 |
| Do farmers have access to agricultural inputs to ensure COOPAMA achieves high production? | 5(3.0) | 8(4.8) | 9(5.5) | 73(44.2) | 70(42.4) | 4.18 | 0.95 |
| **Overall Mean** | | | | | | **4.14** | |

For triangulation, we also computed the correlation coefficient and multiple linear regression analysis between the independent variable and dependent variables as detailed in below Table 5. The results present the relationship between the effects of microfinance loan accessibility on maize production project performance in farmers' cooperatives. A case of COOPAMA cooperative in Nyagatare district. The microfinance loan accessibility factors taken are; loan contracts, loan borrowing, and credit administration process

The statistical package for social science (SPSS) software version 25.0 was used to determine the Pearson coefficients. The Pearson coefficient correlation is between -1 and 1 where -1 to 0 presents a negative correlation (-1 to -0.5 indicates a high negative correlation and -0.5 to 0 indicates a low negative correlation) and 0 to 1 presents a positive correlation (0 to 0.5 presents low positive correlation while 0.5 to 1 presents high positive correlation). According to the results, the correlation between loan contracts, loan borrowing, and credit administration process and project performance was 0.618,0.6430 and 0.745 respectively, presents that there was a significant relationship between microfinance loan accessibility and maize production project performance in farmers' cooperatives.

**Table 5:** Correlation between variables of Microfinance loan accessibility and project

| | | Loan Contract | Loan Borrowing | Credit Administration Process | Project Performance |
|---|---|---|---|---|---|
| Loan Contract | Pearson Correlation | 1 | | | |
| | Sig. (2-tailed) | | | | |
| | N | 165 | | | |
| Loan Borrowing | Pearson Correlation | .613** | 1 | | |
| | Sig. (2-tailed) | .000 | | | |
| | N | 164 | 164 | | |
| Credit Administration Process | Pearson Correlation | .490** | .694** | 1 | |
| | Sig. (2-tailed) | .000 | .000 | | |
| | N | 164 | 163 | 164 | |
| Project Performance | Pearson Correlation | .618** | .643** | .745** | 1 |
| | Sig. (2-tailed) | .000 | .000 | .000 | |
| | N | 165 | 164 | 164 | 165 |
| **. Correlation is significant at the 0.01 level (2-tailed). | | | | | |

## 5.5 Regression Analysis

**Table 6:** Credit administration process, loan contract, loan borrowing

| Model | R | R-square | Adjusted R-square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .751[a] | .564 | .556 | 2.62683 |
| a. predictors: (constant), credit administration process, loan contract, loan borrowing | | | | |

As summarized in Table 6, the R-square=0.751. It was clear that 56.4% of all variables of project performance can be explained by one of all variables of microfinance loan accessibility in the project.

**Table 7:** Microfinance loan accessibility and project performance in maize production

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 1418.727 | 3 | 472.909 | 68.535 | .000[b] |
| | Residual | 1097.139 | 162 | 6.900 | | |
| | Total | 2515.865 | 165 | | | |
| a. dependent variable: project performance | | | | | | |
| b. predictors: (constant), credit administration process, loan contract, loan borrowing | | | | | | |

The results in Table 7, indicate ANOVA[a], the results presented than the variables were statistically significant with F= 68.535and p value=0.000b, it means that there was a significant relationship between microfinance loan accessibility on maize production project performance in farmers' cooperatives.

**Table 8:** Coefficients of microfinance loan
accessibility and project performance in maize production

| Model | | Unstandardized Coefficients | | Standardized Coefficients | T | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 3.470 | 1.325 | | 2.618 | .010 |
| | Loan Contract | .075 | .069 | .072 | 1.078 | .283 |
| | Loan Borrowing | .004 | .071 | .004 | .054 | .957 |
| | Credit Administration Process | .641 | .066 | .710 | 9.692 | .000 |
| a. dependent variable: project performance | | | | | | |

Table 8 presents the constant of independent variables of the microfinance loan accessibility. It is statistically significant since the value is less than 0.05. The results present the variables of microfinance loan accessibility, the credit administration process was statistically significant with p value=0.000[b], the loan contract was statistically significant with p value=0.283[b], and the loan borrowing was not statistically significant with p value=0.957[b].

From the equation:

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

where by Y = project performance then the equation served as;

$$Y = 3.470 + 0.75X_1 + 0.004X_2 + -0.641X_3$$

It is in this regard that using the regression equation mentioned therefore, with respect to the holding all constants (loan contract, loan borrowing, and credit administration) in line with the project of maize production project performance was at 3.470, this implies that ensuring project performance, there was a need only to undertake loan contract, loan borrowing, and credit administration process. The project performance required loan contract, loan borrowing, and credit administration to ensure project performance.

The results present the variables of microfinance accessibility, the credit administration process was statistically significant with p value=0.000[b], the loan contract was not statistically significant with p value=0.283[b], and the loan borrowing was not statistically significant with p value=0.957[b].

From Table 8, coefficients of microfinance loan accessibility and project performance in maize production, unstandardized coefficients were used to obtain the t-test used in the explanation above by B values underwent a series of divisions to attain the t-test; 3.470 divided 1.325 resulted into constant with 2.618, 0.075 divided 0.069 resulted into loan contract factor with 1.078, 0.004 divided 0.071 resulted into loan borrowing factor with 0.054, and 0.641 divided 0.069 resulted into loan contract factor with 1.078, and 0.641 divided 0.066 resulted into credit administration process with 0.710.

## 6. Conclusions

Microfinance loan accessibility is a highly valuable tool in any project work activities related to agriculture as looking at loan contracts for credit demand, loan borrowing for farmers, and administration. It provides a vital mechanism of how any agriculture project works and activities can be measured and how it can help the achievement of project objectives. According to the results, the relationship between loan contract, loan borrowing, and credit administration process was 0.618,0.6430 and 0.745 respectively, and the results presented that the variables were statistically significant with p-value=0.000b, thus, a significant relationship between microfinance loan accessibility and project performance on maize production project performance of COOPAMA Cooperative in Nyagatare district.

### 6.1 Recommendations
According to the results of this study, the researcher provided the following recommendations:
- The agriculture investors should consider the information taken in microfinance accessibility and maize production project performance to ensure productivity.
- The government (MINAGRI, MIFOTRA) should know that the outcomes of project performance must impact their citizens so that they should be engaged in overall activities of agriculture so as for them to create their own jobs
- The MINIGRI should provide regular professional guidelines to farmers to be followed in their farming practices in general.
- Further research should examine the effect of microfinance awareness on hybrid maize project performance in Rwanda; assess the impact of Agriculture Financing on the Maize yield project performance; assess the contribution of stakeholder participation on maize project performance

**Conflicts of interest statement**
The authors wish to maintain that there are no potential conflicts of interest to disclose.

**About the author**
Emmanuel Uzabakiriho is a field officer/ RDO / THRIVE project and a master student at the University of Kigali, faculty of graduate school, department of master of business administration in project management. He has interest in project management and cooperative sustainability.

**References**

Anang, B. T., Bäckman, S., & Sipiläinen, T. (2016). Technical efficiency and it determinants in smallholder rice production in northern Ghana. *The Journal of Developing Areas*,

*50*(2), 311–328. https://doi.org/10.1353/jda.2016.0072

Gbadebo, a. ., Ademayowa, a. ., Mobolaji, a. ., & Ayanyemi, a. . (2013). Determinants of Farmers' Demand for Micro Finance : The Case of A Rural Community In Nigeria. *Journal of Economics and Sustainable Development*, *4*(5), 24–31.

Babajide, A. A. (2011). *Effects of Microfinancing on Micro and Small Enterprises (MSEs) in Southwest Nigeria.* Unpublished PhD Thesis.

Bucagu, C., Ndoli, A., Cyamweshi, A. R., Nabahungu, L. N., Mukuralinda, A., Smethurst, P. (2020). Determining and managing maize yield gaps in Rwanda. *Food security* 12, 1269-1282. https://doi.org/10.1007/s12571-020-01059-2

Collins, A., Mockshell, J., Zeller, M., Siddig, K. and Egyir, I.S. (2017). Agricultural credit provision: what really determines farmers' participation and credit rationing? *Agricultural Finance Review*, *77*(2), 239-256. htps://doi.org/10.1108/AFR-02-2016-0010

Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Pearson.

Deininger, A., Duponchel (2014). Credit Constraints and Agricultural Productivity: Evidence from rural Rwanda. *Journal of Development*, 50(5). https://doi.org.101080/00220388.2014.887687

Deng, X., Xu, D., Zeng, M. Qi, Y. (2019). Does Internet use help reduce rural cropland abandonment? Evidence from China, Land Use Policy v89. https://doi.org/10.1016/j.landusepol.2019.104243

Djato, Wampfler; Roesch, AGRA; FAO. (2016). *The State of Food and Agriculture. Climate Change, Agriculture and Food Policy.* Rome: FAO.

Erenstein, O., Moti, J., Sonder, K., Khondoker, M., Prasanna, B. M. (2022). Global maize production, consumption and trade: Trends and R&D implications. *Food security*, 14, 1295-1319.

FAO, IFAD, WFP (2012). *The state of food insecurity in the world.* FAO.

FAO. (2016). *The state of food and agriculture.* FAO.

FAO. (2020). *Agricultural production statistics.* FAO.

Feyissa, A. (2016). *Customer satisfaction & marketing performance of Melka Awash farmers' cooperatives union in the Oromia region of Ethiopia. Addis Ababa University.* Unpublished Master Thesis

Gbadebo, A., W., Ademayowa, A., A ., Mobolaji, A., W ., & Ayanyemi, A., A . (2013). Determinants of Farmers' Demand for Micro Finance : The Case of A Rural Community In Nigeria. *Journal of Economics and Sustainable Development*, *4*(5), 24–31.

Luka, A., Omolayo, A., O., Elizabeth, S., E. (2022). Analysis of Sources and Socio-Economic Determinants of Access to Loan by Small-scale Rice Farmers in Gwagwalada Area Council, Federal Capital Territory, Nigeria. *Eurasian Journal of Agricultural Research*. 4(*1*), 17-33

Martin, P. (2012). *Contracting farming in developing countries: A review*. Institute of Development Policy and Management. Lund University, Sweden Retrieved from https://www.afd.fr/en/ressources/contract-farming-developing-countries-review

MINAGRI. (2007). *National Seed Policy Ministry of Agriculture and Animal Resource.* MINAGRI.

Mutamuliza, Vishwanatha, Mbaraka. (2022). Determinants of smallholder farmers' participation in microfinance markets in Huye district, southern province, Rwanda. *African Journal of Food, Agriculture, Nutrition and Development,* Vol. 21 No. 7 (2021). Retrieved from https://www.ajol.info/index.php/ajfand/article/view/231657

Mutamuliza, E., & Vishwanatha (2016). Impact of microfinance services on small scale farmers' welfare in Rwanda: a case study of Nyamagabe district. Mangolore. *International Journal of Engineering Research and Modern Education, 1(1), 537-545*

Mbanza, S. (2013). *The role of subsistence farming cooperatives in improving rural household food security: the case of Mwendo Sector, Rruhango District, Rwanda*. University of KwaZulu-Natal. Unpublished Master Thesis. Retrieved from https://researchspace.ukzn.ac.za/items/9915a524-ffa1-4a26-bf09-4fc814a5105d

Ngayizeye, A., & Mumene, P. (2022). Stakeholder Participation and Performance of Funded Project in Rwanda: A Case of Aveh Umurerwa Project in Bugesera District. *Journal of entrepreneurship and project management*, 6(2), 8-32. https://doi.org/10.53819/81018102t2061

National Institute of Statistics Rwanda. (2022). *Seasonal Agricultural survey 2022.* Retrieved from https://www.statistics.gov.rw/datasource/seasonal-agriculture-survey-2022

Pallant, J. (2001). *SPSS survival manual: A step-by-step guide to data analysis using SPSS.* McGraw Hill.

Rwanda Cooperative Agency. (2011). *Smallholder cooperatives and agricultural performance in Rwanda: do organizational differences matter? Division of Bioeconomics.* Department of Earth and Environmental Sciences. RCA

Rwanda Cooperative Agency. (2022). *Statistics of cooperatives in Rwanda*. Quarter two report.

Rooyen, C., V., Stewart, R., J., Wet, T., D. (2012). The impact of microfinance in sub-Saharan Africa: A systematic review of the evidence. *World development*, 40(11), 2249-2262. https://doi.org.10.1016/j.worlddev.2012.03.012

Ruben, R., Heras, J. (2012). *Social capital, governance and performance of Ethiopian coffee cooperatives.* (Vol. 83). Annals of Public and Cooperative Economics.

Uduji, Joseph I.; Okolo-Obasi, Elda N.; Asongu, Simplice (2018) : The impact of e-wallet on informal farm entrepreneurship development in rural Nigeria, AGDI Working Paper, No. WP/18/047, African Governance and Development Institute (AGDI), Yaoundé

Shiferaw, Ankrah Twumasi, M., Jiang, Y. Owusu Acheampong, M. (2019). Capital and credit constraints in the engagement of youth in Ghanaian agriculture. *Agricultural Finance Review*. (80)

Stone, R., Temu, A., Kalisa, M., Cabello, M. (2011). Rural and agricultural financial services strategy. Ministry of Agriculture and Animal Resources and DFID Rwanda. Oxford policy management

Venugopal. (2016). An Assessment of Factors Influencing the Market Performance of Coffee Farmers' Cooperatives in Melka Balo Woreda. The Case of Kurtu Cooperatives Society, Ethiopia. *International Journal of Research and Innovation in Applied Science*, 1(2).

Vishwanatha, Mutamuliza, E. (2017). Impact of Microcredit on Small Farmers' Livelihoods in Rwanda: An Empirical Analysis using Propensity Score matching. mangole. *Amity Journal of Economics, 2(1), 79-96*

Wakilur, R., Jianchao, L., Cheng, E. (2011). Policies and performances of agricultural/rural credit in Bangladesh: What is the influence on agricultural production? Bangladesh: *African Journal of Agricultural Research*. (6)