

The Role of Financial Cooperatives in Promoting Rice Production in Tanzania: A Case of Mvomero SACCO

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Abstract

The agricultural productivity in Tanzania remains below the target because of non-availability and/or inefficiency of available public institutional services for the respective sector. Many studies have explored the impact of the financial institutions and extension services on the agricultural productivity in Tanzania. However, no study has been conducted to find a nexus between Savings and Credit Cooperative Societies (SACCOs) and rice production. Therefore, an empirical investigation of the role of SACCOs on rice productivity is the main aim of this study. The study used a dataset from 120 rice growers collected through face to face interviews from Mvomero district. Both descriptive statistics and regression model of double log form were used for data analysis. The survey findings revealed that access to financial and technical services from SACCOs enabled their members to manage the agricultural business successfully and ultimately increase the level of productivity. Similarly, results from the regression model of double log model depicted that; SACCOs' membership, education status, level of productive inputs, land size, market accessibility and capital investments were statistically significant, implying positive influence on rice productivity in the study area. The findings stress the need to provide financial and technical support through the public and private institutions to ensure crop efficiency and attainment of food security in rural communities.

Keywords: Rice Productivity, Food Security, SACCOs' membership

1. Introduction

Agriculture remains an important source of Tanzania's economy contributing approximately one quarter of the country's Gross Domestic Product (GDP) and engages more than three-quarter of the nation's population with different agricultural tasks (URT, 2014). In Tanzania, farmers grow different kinds of food and cash crops such as maize, rice, tubers (cassava and yams), legumes and vegetables; however inefficiency among the responsible institutions is one of the main obstacles threatening farmers' capacity to improve food security and increase their income.

Among different food crops, rice is an important staple food for many Tanzanians as it contributes to about 2.7% of the country's GDP (Kangile, 2015). The average production of rice has been continuously below the target set by the Government (NBS, 2012). According to Gabagambi (2017), the current production is not enough to feed the local population. The actual yield of rice is less than the potential yield of 3 tons per acre, which implies that rice productivity in the country is low and insufficient.

Various literatures such as Msangya and Wang (2016) found that poor extension services, inaccessibility to agricultural credit and lack of improved technology among the top most reported problems affecting rice production in Tanzania. In addition, Ngailo *et al* (2013) mentioned lack of basic innovative technologies and techniques, hybrid seed varieties, in-efficient irrigation systems and lack of subsidized fertilizers as the main reasons for inefficient rice production in Tanzania. Semboja (2004) articulated that the lack of technical and financial resources in rural areas remained to be major challenges that limit the capacity of farmers to enhance crop and food productivity.

In the last decade, many studies have singled out the importance of agricultural loans in improving agricultural production outcomes. The study conducted by Olaleye and Umar (2009) identified agricultural loans as a factor which enables rice growers to increase productivity and improve their well-being. Similarly, Suleimana and Adjei (2015) found that microfinance services have significantly played a vital role in increasing agricultural production. In addition, Mavimbela *et al* (2010) indicated that financial services from agricultural SACCOs have a positive contribution towards food production since they enhance the farmers' ability to purchase farm implements.

According to Aliou and Zeller (2001), access to credit can significantly increase the ability of poor households to acquire agricultural inputs. Also it reduces the opportunity costs of capital-intensive assets relative to family labor, thus encouraging labor-saving technologies and raising labor productivity. With savings being negligible among the small holder farmers, agricultural credit accessed from microfinance institutions appears to be an essential input along with modern technology for higher productivity (Das *et al*, 2009). Roux (2008)

postulates that financial services may help farmers to access new technologies and high yielding varieties for increasing production in the agricultural sector. Therefore, through microfinance services rural farmers can access agricultural services and enhance productivity for attaining food security and improving their income. Based on the selected studies, it is evident that financial institutions play a big role in increasing the level of productivity at the farm level. However, their findings do not reveal coherently the actual contribution of SACCOs on boosting rice productivity. Therefore, this study mainly focused on examining the role played by SACCOs on enhancing rice productivity in Mvomero District. Specifically, the study explored the attitude of rice growers towards SACCOs and identified socio-economic and institutional factors for promoting rice productivity in the study area.

2. Materials and Methods

2.1 Description of the study area

The study was conducted in Mvomero district council of Tanzania (Figure, 1). The district is located at latitude $06^{\circ} 26'$ South and longitude $37^{\circ} 32'$ East. It covers a total area of 7,325 km² where 549,375 hectares are suitable for crop cultivation and 266,400 hectares are ideal for livestock rearing. The study area was selected due to two main reasons. Firstly, the climate is very suitable for growing rice and other crops such as maize, sugarcane and horticultural products. The average annual rainfall is between 600mm and 2000mm and the average temperature ranges from 18-30° centigrade (URT, 2014). Secondly, it accommodates agricultural SACCOs which provide microfinance services to smallholder farmers engaging in rice production.

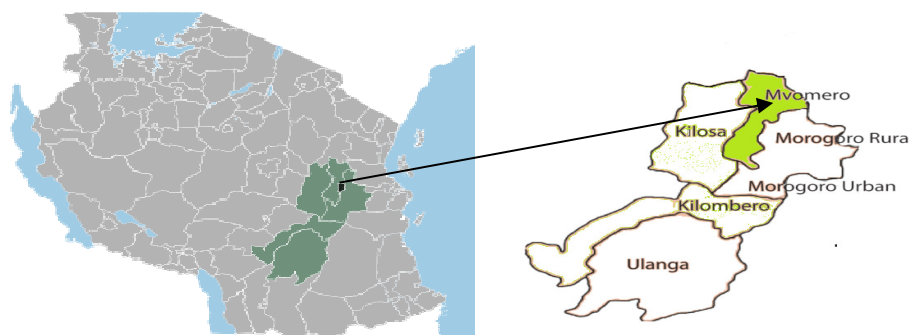


Figure 1: The map of sampling site (Mvomero district) of Morogoro region.

The presence of Agricultural SACCOs in the study area has enabled smallholder farmers to access financial services which remain as one of the main determinant factors for stimulating agricultural production in rural communities. By involving the beneficiaries of SACCOs' services, the study succeeded in the collection of suitable information on the role of financial cooperatives in boosting agricultural production, particularly rice production which employs thousands of smallholder farmers in the respective district.

2.2 Sampling and Data Collection procedure

The study employed different kinds of sampling techniques to collect data from the respondents. The purposive sampling technique was used for selection of the study area and key informants namely; cooperative officers, extension staff and SACCOs' leaders who possessed knowledge and expertise in the area being researched. Simple random sampling was employed to select rice growers. Semi-structured questionnaire and in-depth interview were used to gather raw data from the farmers and key informants respectively. Before conducting a final survey, the questionnaire was pre-tested by 20 farmers in order to remove any form of ambiguity. During the survey, the study used a balanced sample size by involving fifty percent of farmers having an institutional membership and their counterparts without SACCOs' membership.

All interviews were conducted in the context of shared research principles and research ethics (Shah *et al*, 2017). Formal permissions were sought before initiating household interviews explaining the purpose and objectives of the study and usage of data for research purposes. Through this modality, the ultimate goal was attained due to the effective participation from the selected respondents.

2.3 Empirical modeling

The survey collected data were coded and analyzed using Statistical Package for Social Sciences (SPSS version 21). Descriptive and inferential statistics were used to analyze quantitative data whereas content analysis was employed for analyzing qualitative information. The descriptive statistics such as frequencies, percentages and means were used to examine socio-economic characteristics of the respondents' household. A regression model of double log form was used to estimate factors and determinants of rice productivity in the study area. The double log regression model was used because; it gives direct elasticity of the parameters.

The empirical form of double log model is given as:

$$\ln(Y_i) = \beta_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + \varepsilon_i \dots\dots\dots (1)$$

Where

Y_i = Rice productivity, β_0 is a constant term, β_{1-9} are the coefficients need to be estimated and ε_i is the error term

X_1 = Age. *Continues* (Number of years)

X_2 = Gender. *Dummy* (1 = Male; 0 = Female)

X_3 = Education *Continues* (Number of schooling years)

X_4 = Level of productive inputs *Continues* (Amount spent on all variable inputs including fertilizers, improved seeds, and herbicides)

X_5 = Farming Experience. *Continues* (Number of years)

X_6 = Market Accessibility. *Dummy* (1 = Local Market; 0 = Urban Market)

X_7 = Capital Investment. *Continues* (Amount of money allocated for rice production)

X_8 = Rice Yield. *Continues* (number of tonnes of rice being produced per acre in the season)

X_9 = SACCOs' Membership. *Dummy* (1 = Yes, 0 = No)

3. Results and Discussions

3.1 Respondents socio-demographic characteristics

Table 1 shows that age of the respondents between 25- 40 years ranked the highest while those greater than 55 years were the least. This means that most of the farmers were energetic and capable of engaging fully in agricultural production for the common good. Similar results were reported by Osanyinlusi *et al* (2016) that farmers who are within the productive age can produce more efficiently than the aged farmers.

Table 1: Respondents' socio-demographic characteristics (n=120)

Characteristics		SACCOs Members (n _s =60)		Non-Members (n _{ns} =60)	
		No	%	No	%
Respondent's Age (Years)	21-40	29	48.4	28	46.7
	41-55	21	35.0	24	40.0
	>55	10	16.6	8	13.3
Respondent's sex	Male	37	61.7	36	60.0
	Female	23	38.3	24	40.0
Education status	No schooling	3	5.0	4	6.7
	Primary Education	38	63.4	44	73.3
	Secondary Education	14	23.4	10	16.7
	Post-secondary Education	5	8.3	2	3.3
Family Size	1-5	23	38.3	25	41.7
	6-10	28	46.7	24	40.0
	>10	9	15.0	11	18.3
Land Size (acres)	1-3	21	35.0	29	48.3
	4-6	28	46.7	24	40.0
	>6	11	18.3	7	11.7
Farmers Experience (Years)	1-10	17	28.3	22	36.7
	11-20	25	41.7	26	43.3
	>20	18	30.0	12	20.0

Note: n_s implies number of SACCOs' members and n_{ns} for non SACCOs' members

The result of the analysis on gender revealed that more than 59% of the respondents were male farmers while the minorities were female farmers. These findings imply that a large number of rural women do not engage in agricultural production because of undesirable cultural practices that limit them from accessing adequate productive resources which are vital for boosting the rural economy. Rahman (2008) reported that female farmers lack access to adequate productive resources such as land, extension services and agricultural inputs in spite of their immense contributions to agriculture.

Moreover, the findings indicate that about 63.4% of SACCOs' members and 73.3% of non-members had attained primary education whereas 5% of SACCOs' members and 6.7% of non-members were illiterate. About 23.4% of SACCOs' members and 16.7% of non-members had secondary education and 8.3% of the members and 3.3% of the non-members had attained post-secondary education. According to Kehinde (2005) literate farmers are essential resources for improving the agricultural sector in rural communities since they easily adopt new agricultural technologies and utilize them for enhancing productivity.

Results in Table 1 also show that the highest percentages (46.7%) of SACCOs' members had a medium household size as compared to 40% for the non-members. About 15% of the SACCOs' members had more than

ten household members as compared to 18.3% for the non-members. The findings revealed clearly that most of SACCOs' members and non-members had more than 5 household members. Kwai and Urassa (2015) reveal that in rural Tanzania, having more family members and dependants implies having cheap labor for different developmental activities.

The findings indicated that all respondents could access land for agriculture and other productive roles. Most of the SACCOs' members possessed more than 3 acres of land while for their counterparts the majority owned between 1-3 acres of land. SACCOs' members owned more acres of land compared to non-members due to their strong financial base. According to key informants, SACCOs' credit enables members to procure land and other productive resources which are essential for enhancing agricultural production in rural communities.

Moreover, the results depicted that about 71.7% of SACCOs' members had engaged in agricultural production for more than 10 years as compared to their counterparts without SACCOs' membership (63.3%). This implies that the highest percentages of respondents have been working in the respective sector for a long time. This experience is necessary for improving agricultural productivity. Obasi *et al* (2013) affirmed that agricultural productivity is positively associated with the number of years in farming.

3.2 SACCOs' intervention in Rice Production

In Tanzania, commercial banks are reluctant to engage in agricultural finance because of a pessimistic view towards the sustainability of agriculture which employs majority of Tanzanians. The high risks in agricultural finance remain to be the main constraint inhibiting financial institution from lending agricultural loans. Smallholder farmers cannot access agricultural credit from the commercial banks because of their weak financial position.

The existence of SACCOs as financial cooperatives gives smallholder farmers an opportunity to mobilize resources and access financial services (Bwana and Mwakujonga, 2013). According to Kwai and Urassa (2015) financial services enable farmers to invest in income generating activities (farm and non-farm activities). Girabi and Mwakaje (2013) postulate that accessibility to agricultural credit enable farmers to purchase inputs and improve farming technologies. Therefore, SACCOs' intervention in the agricultural sector has boosted productivity and ensured better livelihood status among farmers.

The study identified that Mvomero SACCO has played a significant role in stimulating rice production in the study area. The provision of agricultural credit with an interest rate of 10% enables rice growers to procure agricultural technologies and access productive resources (land and labor) for the sake of increasing production and improving farmers' income. The findings also revealed that the average amount of capital being invested by SACCOs' members for rice production was Tshs 2,500,000 compared to Tshs 1,000,000 for their counterparts without membership. This implies that SACCOs' services empower their members to invest more resources in rice production in order to attain food security and earn more income. Furthermore, results indicated that proper investment in rice production has enabled SACCOs' members to earn an average of Tshs 4,000,000 as annual income compared to Tshs 1,850,000 for non-members. Based on the indicated findings, it is evident that Mvomero SACCO remains as an essential institution for improving agricultural productivity and securing farmers' livelihood status in the study area.

3.3 Analysis of Rice Growers' attitude towards SACCOs

The results revealed that 85 rice growers (70.8) perceived SACCOs as essential institutions for promoting rice production through the provision of financial services while 22 respondents (18.3) denied the statement. Also, 62 respondents (51.7%) agreed with the statement "agricultural credit accessed from SACCOs stimulate rice production and thus contribute to the attainment of food security in the community". These findings imply that credit and other financial services accessed through SACCOs' remains one of the underlying factors for increasing rice productivity in the study area.

Results in Table 2 further indicated that 65 respondents (54.1%) disagreed with the statement "through SACCOs, rice growers can easily access agricultural technologies and thus enhance productivity" whereas 47 respondents (39.2%) perceived SACCOs as financial cooperatives which helped rice growers access proper agricultural technologies such as improved seeds, fertilizers and pesticides in order to ensure efficiency in production. About 85 respondents (70.8%) agreed that SACCOs have played an essential role in addressing gender equality among the rice growers while 23 respondents (19.2%) opposed this statement. Furthermore, 82 rice growers (68.4%) perceived SACCOs as institutions that create opportunities for the rice growers to access more trainings on financial management, entrepreneurship and good agricultural practices than their counterparts without SACCOs' membership.

Table 2: Respondents attitude towards SACCOs' intervention in the rice sub-sector

Attitudinal statement	Disagree	Neutral	Agree
SACCOs support rice farmers to access financial services	22 (18.3)	13 (10.8)	85 (70.8)
Credit accessed through SACCOs can stimulate rice production	46 (38.3)	12 (10.0)	62 (51.7)
Through SACCOs, rice growers can easily access agricultural technologies and thus enhance productivity	65 (54.1)	8 (6.7)	47 (39.2)
SACCOs enable rice farmers to access marketing services smoothly	48 (40.0)	15 (12.5)	57 (47.5)
SACCOs enable both male and female rice farmers to work together for enhancing productivity.	23 (19.2)	12 (10.0)	85 (70.8)
SACCOs create an opportunity for rice growers to access entrepreneurship training and extension services easier than non-members	28 (23.3)	10 (8.3)	82 (68.4)

NB: Numbers in Brackets indicate percentages

Based on our findings, it is evident that SACCOs continue to play a significant role in supporting the livelihood of farmers through the provision of financial services and capacity building. These findings are in line with Mwakajumilo (2011) and Gasper's (2013) observation that SACCOs play crucial roles in improving literacy and access to credit for enhancing productivity and improving farmers' well being.

3.4 Socio-economic and institutional factors influencing rice productivity

Through double-log model, the study found that SACCOs' membership was highly significant implying that this variable would greatly influence rice productivity among members. Similarly, Govereh *et al* (1999) and Zeller *et al* (1998) identified a positive relationship between cooperative societies and high productivity. Furthermore, the findings from Table 3 indicated that education was highly significant implying that the level of rice productivity was related to the educational attainment of farmers. Rice growers with higher education status were able to produce more than their counterparts because of knowledge in particular, their ability to be calculative and adaptive to new agricultural technologies as well as the utilization of available resources. According to Chidi *et al* (2015) education plays an essential role in improving agricultural practices in the rice sub-sector and increasing productivity among the smallholder farmers.

Our findings depicted that access to agricultural inputs was positively signed and highly significant at the 1% level of probability implying that the amount spent on fertilizers, improved seeds and herbicides can determine the level of productivity. Farmers who spend more inputs in rice production have the possibility to enhance productivity than their counterparts without SACCOs' membership who spend on fewer resources.

More findings revealed that capital investment was highly statistically significant having a positive contribution to rice productivity. Our survey results are in agreement with the findings of Kato (2007) and Nkuba *et al* (2016) who perceived capital as the substantial attribute for enhancing rice productivity.

Table 3: Relevant socio-economic and institutional factors for enhancing rice productivity

Variables	Definition of exogenous variables	OLS estimates (Double log model) (SD)
Intercept		2.324*** (2.14)
SACCO membership	(1=yes; 0=no)	0.03*** (0.04)
Age (Continues)	Number of years	-0.02 ^{NS} (0.81)
Gender (Dummy)	(1=male; 0=female)	-0.05 ^{NS} (0.06)
Education (Continues)	Number of years	0.55*** (0.86)
Land size (Continues)	Number of acres	0.48** (0.04)
Level of productive inputs (Continues)	Amount of inputs	1.62*** (0.03)
Market accessibility (Dummy)	(1= local;0= urban)	0.05** (0.02)
Farming experience (Continues)	Number of years	-0.15 ^{NS} (0.24)
Capital investment (Continues)	Amount of money	0.43*** (0.08)

Note. Where, *, ** and *** represent level of significance at <10, < 5 and < 1 percent, respectively. NS is indicated non-significant parameters. SD represents the standard deviation of given variables.

The land size was statistically significant implying positive influence on rice productivity. This indicates that as the size of the farm increases, the productivity increases too. Similarly, Mishra *et al* (2014) revealed that rice growers who utilize large size farms can produce more than their counterparts with small farms. In addition, market accessibility was positively signed and statistically significant at the 5% level of probability implying its positive influence on rice productivity According to Ngailo *et al* (2016) reliable market remains to be one of the key drivers for enhancing rice productivity in rural communities.

4. Conclusion and Recommendations

The study has examined the role played by SACCOs in promoting rice production in Tanzania. The study employed parametric techniques to analyze the cross-sectional data and found that SACCOs' members were more efficient in rice production compared to their counterparts without SACCOs' membership. Similarly, the OLS regression analysis found that SACCOs' membership, educational attainment, access to productive inputs, land size, access to market and capital investment contributed to the increase in rice productivity. The results of the study stress the importance of public and private agricultural institutions to provide an access to financial cooperative societies as the study has identified their positive contribution to crop productivity. Also the responsible authorities should allocate sufficient resources for capacity building in order to empower Agricultural SACCOs in rural areas. This strategy would ensure provision of financial services for smallholder farmers, who are the main participants in the agricultural sector.

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