

Impact of Savings and Credit Cooperative Societies' Services on Pineapple Growers' Income: Case of Kinole SACCOS

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Abstract

Pineapple production is one of the essential agricultural economic sectors employing thousands of smallholder farmers in Tanzania. Despite its necessity in ensuring food security and improving farmers' income, the level of productivity remains low in comparison to market demand. Among other factors, this situation is also attributed by financial constraints and weak agricultural institutions, which limit farmers' capacity in attaining their goals. The presence of Savings and Credit Cooperative Societies (SACCOS) provides an opportunity for pineapple growers to participate fully in production and ultimately improve their overall incomes. This study assessed the impact of SACCOS' services on pineapple growers' income in Morogoro District where Kinole SACCOS was chosen as the case study. About 70 SACCOS' members, 70 non-members and key informants were involved in providing primary data through semi-structured questionnaires and key informants interviews respectively. Statistical Package for Social Science (SPSS software) was used to analyze quantitative data whereas content analysis was applied to qualitative data. The study found that SACCOS' intervention in the pineapple sub-sector brought a positive impact on productivity and income for the members. The results depicted that; SACCOS' membership, agricultural credit, entrepreneurship training and pineapple production were significant; implying positive influence on small holder farmers' income. T-test analysis showed a highly significant difference between SACCOS' members and non-members on income earned from pineapple production and other income generating activities. Based on the indicated findings, the study recommends that rural SACCOS should be empowered with respect to capacity building and financial subsidies by the government and other development partners to ensure improved effectiveness and efficiency in the provision of financial services to farmers in rural communities.

Keywords: Pineapple productivity; SACCOS' membership; Income; Morogoro District

1. Introduction

Fruit production is one of the horticultural activities practiced in Tanzania which has made significant contribution to food security, nutrition improvements as well as economic growth. Farmers in Tanzania cultivate different kinds of tropical and higher value fruits such as pineapples, oranges, mangoes, and bananas as a means of improving their livelihood status and attaining food security. According to Taylor (1999) cited by Akhilomen et al (2015), fruits are significantly singled out in human nutrition for the supply of essential minerals, vitamins, some hormone pre-cursors in addition to protein and energy.

Pineapple (*Ananas comosus L. Merr*) is native to Southern Brazil and Paraguay where wild relatives can be found. It is drought tolerant and well adapted to tropical acidic sandy soils with pH ranging from 4.5 to 6.5 and propagated by new vegetative growth (Ubi et al, 2008; cited by Adinya et al, 2010). Pineapple is used mainly as food in the form of snacks and fruit-juices while in most parts of the world the fermented juice is used to make vinegar and alcohol. Furthermore, Pineapple leaves are used to produce fibers for making cloths and ropes. In addition, the whole plant can be used as a source of energy (Samson, 1986).

In Tanzania, pineapple is an important fruit crop grown extensively in Morogoro, Tanga, Pwani, Geita and Ruvuma regions. This fruit has the potential of improving the livelihoods of smallholder farmers and remains the main source of their income (Mauya, 2016). Pineapple growers in Tanzania practice both organic and conventional agriculture depending on the ecological pattern of the production area and the selected market. However, majority of farmers in the pineapple sub-sector prefer organic farming because it protects the environment and ensures higher returns at the market level. Ngerenza and Pawelzik (2016) revealed that organic agriculture improves soil fertility and stimulates the role of plants and microbes in natural soil processes, thus enhancing productivity. Moser (2014) articulated that organic agriculture strengthens farmer's self reliance and independence from inputs, sustains resilience and persistence of agricultural ecosystems and opens up new markets and income generation.

Despite strategies being taken by smallholder farmers in boosting production in the pineapple sub-sector, the level of productivity in Tanzania remains low and insufficient. A report from HODECT (2010) indicated that the total output of pineapple is 30,000 metric tons per year compared to Kenya where the level of

productivity reaches 339,850 metric tons per year. The annual pineapple consumption in Tanzania is approximately 214,840 metric tons (Mauya, 2016). This implies that, pineapple producers do not have the capacity to enhance productivity and meet the country's annual demand.

This situation can be attributed to challenges faced by majority of pineapple growers in the country which ranges from; financial constraints, the absence of appropriate transport facilities, inability to access appropriate inputs, lack of market information and undeveloped processing industries. These challenges affect the well being of smallholder farmers as they limit their capacity to enhance productivity and attain food security at the household level. Kayitesi (2011) pointed out that poor farming practices, little access to credit, high transport costs and improper marketing systems remain some of the major obstacles affecting productivity in the pineapple sub-sector.

One strategic approach proposed to enhance productivity and improve income among the pineapple growers is the establishment of Savings and Credit Cooperative Societies (SACCOS) in their communities. The presence of such institutions in rural areas intends to ensure accessibility to credit and other technical services as a means of improving agricultural practices, enhancing productivity and securing household income. According to Bwana and Mwakujonga (2013), SACCOS are voluntary associations whereby members can mobilize financial resources for various developmental activities. In rural Tanzania, a large number of farmers can access financial services from such financial cooperatives in order to improve the agricultural sector and rural livelihoods. Girabi and Mwakaje (2013) hypothesize that SACCOS' services enable smallholder farmers to access inputs, increase agricultural productivity and access profitable markets for their commodities. Also, Tenaw and Islam (2009) reported that micro-credit, which is one of the services offered by SACCOS, enhances agricultural output performance and reduces poverty among the farmers. In addition, Carte (1989) postulates a positive relationship between micro-credit and agricultural production. Smallholder farmers can use the available financial resources to procure inputs, improve agricultural practices and raise their income through accessing markets for their produce.

Despite the importance of SACCOS in boosting agricultural productivity in rural Tanzania, little information is known about the role played by these financial cooperatives in enhancing pineapple production and improving income among the smallholder farmers. Therefore, this study assessed the impact of SACCOS' operations on income poverty reduction among the pineapple growers in Tanzania, where Kinole SACCOS was selected as the case study. Specifically, the study focused on examining SACCOS' services offered to their members and finally assessing the impact of SACCOS' operation on income poverty reduction among the pineapple producers.

2. Materials and Methods

2.1 Description of the study area

The study was conducted in Morogoro District which is located on the north east side of Morogoro region in the slopes of Uluguru Mountains at an altitude ranging between 300-600 meters above the sea level. The average rainfall is between 600-3000mm and the temperature ranges from 25-30 ° centigrade. The district lies between latitude 6° and 8° south of equator and longitudes 36° and 38° east of Greenwich and covers a total area of 11,731km² that is approximately 16.06% of the total regional areas of 73,039 km² (URT, 2014).

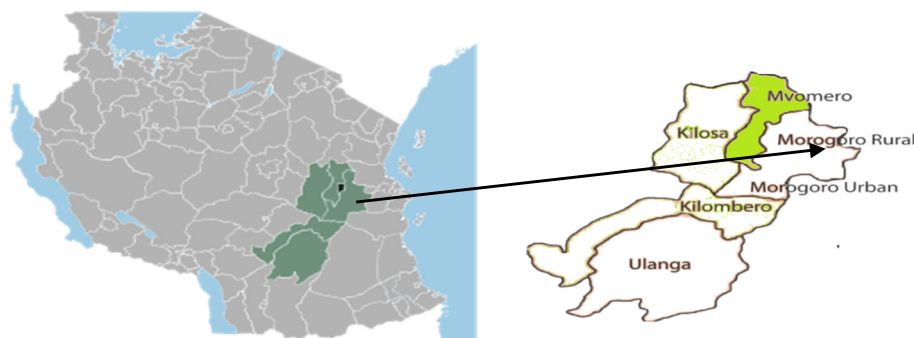


Figure 1: Map showing the study area (Morogoro District)

The study area was selected because of the suitable climate for pineapple production. In addition, there are Savings and Credit Cooperative Societies in the district which provide financial services to small dairy farmers who engage directly in pineapple production and other agricultural activities.

2.2 Sampling and Data Collection procedure

Both probability and non-probability sampling were employed for selecting the appropriate population sample for the study. Kinole SACCOS was chosen intentionally because it accommodates members who engage in

pineapple production. Also purposive sampling was applied for selecting key informants namely; SACCOS leaders, extension and cooperative officials because of having knowledge and expertise on the issues studied. Simple random sampling was used for selecting 70 SACCOS' members and 70 non-members in order to collect proper information on microfinance operations, pineapple production and farmers' household income. Semi-structured questionnaires and key informants interviews were used for gathering primary data from the selected respondents. Also, secondary data were collected from different publications and government reports.

2.3 Data Analysis

Descriptive statistics such as frequency distribution and percentages were used to analyze socio-demographic characteristics while the regression of double log form was used to analyze the impact of SACCOS' operations on pineapple growers' income. Independent sample T-test was employed to compare means of incomes between pineapple growers with SACCOS' membership and their counterparts without SACCOS' membership.

The empirical form of double log model is given:

$$\ln(Y_i) = \beta_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + \varepsilon_i$$

Where

Y_i = Household income, 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 = Family size. *Continues (Number of household members)*

X_5 = SACCOS' membership *Dummy (1 = members; 0 = non-members)*

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

X_7 = SACCOS' credit *Dummy (1 = accessed; 0 = otherwise)*

X_8 = Accessibility to Entrepreneurship training *Dummy (1 = accessed; 0 = otherwise)*

X_9 = Pineapple production *Dummy (1 = members; 0 = non-members)*

3. Results and Discussions

3.1 Respondents socio-demographic characteristics

Results indicated that most of the respondents in both groups were within (41-55) years of age followed by the age interval of (25-40) years while the minority were over 55 years of age. The mean age of SACCOS' members was 42 years while non-SACCOS' members averaged 41 years. This implied that majority of respondents were energetic, economically active and fully capable of engaging in pineapple production for improving their well being.

With respect to gender, Table 1 shows that 54.3% of SACCOS' members were males as opposed to 45.7% females. For non-SACCOS' members, about 57.1% of them were males while 42.9% were females. This indicates that males were dominant in both SACCOS' membership and pineapple production. According to Maleko et al (2013), rural SACCOS accommodates more males than females because of the socio-cultural and economic practices which operate under the patriarchy system.

From the findings, it was revealed that a great portion of both SACCOS' members and non-members had attained primary education while the minority attained post-secondary education. Approximately 18.6% of the SACCOS' members and 15.8% of non-members had attained secondary education. These findings suggest that the study area accommodates majority of literate farmers who can adopt new agricultural technologies and innovations for the sake of increasing the level of productivity and improving their household incomes. Similarly, Pudasaini (1983) articulated that education is essential for improving agricultural productivity in rural communities. Educated farmers can easily adopt new agricultural technologies and utilize them for enhancing productivity.

The findings revealed that most of the respondents from both groups had a medium household size. Around 17.2% of SACCOS' members and 20% of non-members had large households with more than 10 members. These findings infer that, the majority of pineapple growers have more than 5 household members who can also be utilized as potential human resources for boosting agricultural production and ensuring attainment of food security at the household level.

Results in Table 1 also demonstrate that 50% of SACCOS' members possessed between 3-5 acres of land whereas 21.5% of them owned more than 5 acres of land. Similar findings revealed that majority of non-members (51.4%) possessed between 1-3 acres of land while 14.3% of them possessed more than 5 acres of land. Therefore, all farmers had access to land for pineapple production, despite the fact that SACCOS' members possessed more acres of land than their counterparts without SACCOS' membership. This disparity could be attributed by financial services accessed from SACCOS which enabled their members to procure land and other productive resources for the sake of increasing the level of productivity and improving their income.

Table 1: Respondents' socio-demographic characteristics (n=140)

Characteristics		SACCOS Members (n=70)		Non-Members (n _s =70)	
		No	%	No	%
Respondent's Age (Years)	21-40	25	35.7	29	41.5
	41-55	36	51.5	30	42.8
	>55	9	12.8	11	15.7
Respondent's sex	Male	38	54.3	40	57.1
	Female	32	45.7	30	42.9
Education status	No schooling	4	5.7	5	7.1
	Primary Education	49	70.0	53	75.7
	Secondary Education	12	18.6	11	15.8
	Post-Secondary Education	4	5.7	1	1.4
Family Size	1-5	18	25.7	20	28.6
	6-10	40	57.1	36	51.4
	>10	12	17.2	14	20.0
Land Size (acres)	1-3	20	28.5	38	54.3
	4-6	35	50.0	22	31.4
	>6	15	21.5	10	14.3
Farmers Experience (Years)	1-10	16	22.8	20	28.5
	11-20	28	40.0	35	50.0
	>20	33	47.2	15	21.5

Note: *n* implies number of SACCOS' members and *n_s* for non SACCOS' members

The findings reveal that 47.2% of SACCOS' members had more than 10 years of experience in farming while majority of non-SACCOS members had between 5-10 years of experience in agricultural production. This implies that majority of respondents had more than 5 years farming experience. Therefore, the study data was collected from a reliable population sample since they possessed sufficient information on agricultural practices in the study area.

3.2 SACCOS' operations in the pineapple sub-sector

Savings is the most important practice in financial institutions since it enables members to access loans and other financial services. The results from table 2 reveal that most of SACCOS' members had savings of 2,000,000-4,000,000¹Tanzanian Shillings (TAS) whereas the minority (14.2%) had savings of less than 2,000,000 TAS. About 25.8% of the respondents had savings of more than TAS 4 million. These findings imply that majority of SACCOS members had developed a culture of saving because of stipulations required for accessing other financial services from their organization. According to Cheruiyot (2012) savings enables SACCOS' members in agricultural communities to access loans that can be used for stimulating agricultural production and ultimately improving farmers' household income.

Results also depict that 64.3% of the respondents accessed more than 4,000,000 TAS as loans for boosting agricultural production whereas 35.7% of them accessed less than 4,000,000 TAS for the same purpose. These findings suggest that, most of the SACCOS' members can access credits for promoting agricultural and non-agricultural activities in their areas due to the favorable terms on interest rate. Katimbo (1999) articulated that accessibility to reasonably priced credit enables SACCOS' members to raise their productive potential and ultimately improve their livelihood status.

Table 2: SACCOS' services provided to pineapple growers (n=70)

SACCOS' Services		Frequency	Percentage
Savings per year (TAS)	<2,000,000	10	14.2
	2,000,000 – 4,000,000	42	60.0
	>4,000,000	18	25.8
Agricultural Loans per year (TAS)	< 4,000,000	25	35.7
	>4,000,000	45	64.3
Trainings on Entrepreneurship	Once	13	18.6
	Twice	34	48.6
	>Twice	23	32.8

With respect to trainings, the study indicated that 48.6% of SACCOS members attended trainings on good agricultural practices and entrepreneurship twice per year while 18.6% of them attended only once during the same period. Also more findings reveal that 32.8% of SACCOS' members accessed similar technical services

¹ 2195 Tanzanian Shillings (TAS) = 1 US Dollar

more than twice per year. Based on the indicated findings, it is evident that Kinole SACCOS as the microfinance institution creates a conducive environment for its members to access trainings and other financial services as a means of promoting the agricultural sector and non-agricultural activities which have a significant impact on rural livelihoods.

3.3 Impact of SACCOS interventions on pineapple growers' income

The study employed double-log model in order to estimate the contribution of SACCOS' operations to pineapple growers' income. As it appears on Table 3, the coefficient of SACCOS' membership was found to be positive and significantly related with the respondents' household income. This implies that pineapple growers with membership have the opportunity to increase productivity and ultimately improve their income. The findings are supported by Kwai and Urassa (2015) who reported that SACCOs have played an essential role in enhancing productivity and securing farmers' livelihood status.

The regression results from Table 3 also portrays that SACCOS' credit had a positive influence on income among the pineapple growers and its impact was highly statistically significant. The positive coefficient of SACCOS' credit implies that the more members have access to credit the greater an increase in productivity as well as income. Similarly Nkonya et al (2008) highlighted that accessibility to credit enables SACCOS' members to enhance agricultural productivity and raise their household income. In addition, Koech et al (2014) revealed that access to credit enhances productivity, improves income and thus reduces the poverty level among pineapple producing households.

Table 3: Impact of SACCOS' interventions on pineapple growers' income

Variables	Definition of exogenous variables	OLS estimates (Double log model) (SD)
Intercept		23.334 ^{***} (0.11)
SACCO membership (Dummy)	(1=yes; 0=no)	0.24 ^{**} (0.03)
Age (Continues)	Number of years	-0.46 ^{NS} (0.26)
Gender (Dummy)	(1=male; 0=female)	-0.35 ^{NS} (0.16)
Education (Continues)	Number of years	0.24 ^{**} (0.14)
SACCOs' Credit (Dummy)	(1=accessible; 0=otherwise)	0.18 ^{***} (0.02)
Family size (Continues)	Number of heads	-0.12 ^{NS} (0.23)
Market accessibility (Dummy)	(1= local;0= urban)	0.22 ^{**} (0.04)
Accessibility to training (Dummy)	(1=yes; 0=no)	0.12 ^{**} (0.03)
Pineapple production (Dummy)	(1=members ;0=otherwise)	0.48 ^{***} (0.04)

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

Results from Table 3 also reveal that market accessibility had a positive relationship with the increase of income among pineapple growers as its impact was statistically significant. This implies that proper marketing structure encourages pineapple growers to participate fully in production with the purpose of securing food security and raising household income. Yusi (2016) articulates that efficient marketing systems influence high productivity for pineapple growers and enables them to receive higher profits.

The coefficient of pineapple production was positively signed and its impact on farmers' household income was highly statistically significant. The findings denote that the possibility of pineapple growers with SACCOS' membership to raise income is higher than their counterparts without membership. Accessibility to institutional services gives their members an opportunity to increase productivity in the respective sub-sector producers and ultimately improve their livelihood status. According to Baruwa (2013) and Koech et al (2014), a favorable environment in the agricultural sector enables more farmers with SACCOS' membership to participate effectively in pineapple production, enhance food security and ultimately, earn more income.

The coefficient of education was positively signed and statistically significant implying positive relationship between educational attainment and income among the pineapple growers. Education produces skilled labor force that can adopt new production techniques and ensure higher productivity in the pineapple sub-sector. High level of productivity enables pineapple growers to secure food security and improve their income at the household level. On the same token, Kayitesi (2011) reported that higher level of education provides a greater opportunity for farmers to apply better agronomic practices for enhancing pineapple production and ensuring higher returns for producers.

Furthermore, regression results from Table 3 indicate that accessibility to trainings on entrepreneurship and financial management had a positive influence on income among pineapple growers and its impact was statistically significant. Through trainings, small holder farmers improve their skills on managing agricultural practices and other income generating activities and hence experience positive impacts on their livelihoods. This suggests that capacity building is essential for the development of the agricultural sector and farmers remains

agents in the transformation process. Ashfaq et al (2017) pointed out that through capacity building, farmers can generate awareness and gain skills to manage their income generating activities more efficiently and sufficiently in order to secure their livelihood status.

3.4 Analysis on Income status between SACCOS' members and non-members

The study employed T-test analysis to compare income levels between SACCOS' members and non-members. The results from Table 4 highlights that the average income earned by SACCOS' members from pineapple production was higher than their counterparts without membership. The variation between the two groups was highly statistically significant implying positive contribution of SACCOS' services to productivity and income among pineapple growers.

Table 4: Income status between SACCOS' members and non-members

Income status for the Respondents	Mean in TAS ('000)	F-value	P-value
Annual income from pineapple production (members)	3520	16.765	0.001***
Annual income from pineapple production (non-members)	1870		
Annual income from non-farm activities (members)	2500	14.345	0.001***
Annual income from non-farm activities (non-members)	1250		

NB: Where, *, ** and *** represent level of significance at <10, < 5 and < 1 percent, respectively. NS indicates non-significant parameters. TAS-Tanzania shillings

According to Table 4, the average income earned by SACCOS' members from non-agricultural activities was higher than their counterparts without membership and the variation between the two groups was statistically significant. This implies that financial services accessed from Kinole SACCOS enabled its members to possess milling machines, transport facilities and wholesale shops for generating additional incomes for their households. Baruwa (2013) reveals that SACCOS' services enable their members to capture investment opportunities that arise within their environment in order to generate additional income and ultimately improve their wellbeing.

4. Conclusion and Recommendations

This study assessed the contribution of SACCOS to income poverty reduction among pineapple growers where Kinole SACCOS was selected as the case study. Through cross-sectional design, information from SACCOS' members and non-members were gathered and analyzed. The results revealed that SACCOS' services played an imperative role in boosting pineapple production and increasing household incomes among the pineapple producers. This implies that lack of financial and institutional supports affect the capacity of non-SACCOS' members to increase productivity and earn sufficient income. Therefore, discrepancies in productivity and income between SACCOS' members and non-members exist due to the presence of financial cooperatives which focus on improving the livelihoods of their members.

Based on the conclusion, the study recommends the following:-

- SACCOS operating in rural communities should focus on increasing the number of members. This strategy would help the financial cooperatives to accumulate more capital through savings and add the number of beneficiaries who can use the resources to boost agricultural productivity and increase household income.
- The government at both local and central level should create a favorable environment for the Agricultural SACCOS to access financial and technical services from the formal financial institutions in order to stimulate pineapple production and ensure better livelihood status among producers.
- Despite the importance of SACCOS' in improving the level of productivity in the agricultural sector, the government should continue to strengthen extension services for the pineapple growers in order to improve agronomic practices which have a significant impact on productivity and income among the pineapple growers.

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