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**Impact of SACCOS on the Use of Improved Farm Inputs: An Empirical Evidence of Rural Micro-finance Schemes, in Geita region, Tanzania**

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**Abstract:**

*This paper analyzes the impact of Savings and Credit Cooperatives Societies (SACCOS) as one of the rural microfinance schemes on the improvement of small-scale farming through the use of improved farm inputs. It uses a case study research design to collect information from Kalangala and Kasamwa wards in Geita region. A structured questionnaire was used to collect primary data from 120 small-scale farming households out of which 60 were SACCOS members and the remaining 60 were non SACCOS members. Focus group discussion and secondary data collected from key informants were used to compliment information collected from the sample households. The collected data was analyzed using the Statistical Package for Social Sciences (SPSS) program. In particular, descriptive statistics were used to depict frequency distribution, percentages, means and standard deviations so as to characterize the sample households. The differences in the performance of SACCOS and non-SACCOS members was determined by using independent t-test and Chi-square. The findings indicates that, credit availability increases small scale farmer's ability to utilize more productive and improved agricultural inputs and hence increased productivity and households' well being. Chi square results on labour hiring, use of improved seeds and use of fertilizer indicated significant difference ( $p < 0.05$ ) between SACCOS and non SACCOS members. In addition, t-test results indicated that SACCOS members significantly harvested more yield ( $p < 0.05$ ) as compared to non-SACCOS members. In all cases, SACCOS members performed better than non-SACCOS members. Conclusively, it is very important for the small-scale farmers to have an access to credit to cover the necessary costs during production process as it will increase productivity. This underscores the need for small-scale farmers to join and engage in rural microfinance schemes as they are recognized as the major agricultural financier in the rural settings. Furthermore, SACCOS are advised to reduce interest rates especially on agriculture loans in order to benefit many smallholder farmers.*

**Key words:** Micro-finance, Rural Micro-finance, Improved Small-scale farming.

**1.0 INTRODUCTION**

Microfinance institutions play a major part in both economic and community life of many millions of people around the world (Ashaolu *et al.*, 2011 O kon *et al.*, 2013; Vaesen, 2001). One of the microfinance institutions in Tanzania is the *Savings and Credit Cooperatives Societies (SACCOS)*. SACCOS is a unit of people with common problems and interests who have voluntarily decided to pool their resources together in order to solve their common and individual social and economic problems. According to URT (2005), SACCOS members have common problems, interests, occupation or residents living and working in the same area and/or situation (URT, 2003). Consequently, there are various forms of SACCOS including farmers and agricultural cooperatives, banking and insurance cooperatives, and the worldwide credit unions network.

One identified principle problem that accounts for the low agricultural production in most parts of the least developing countries, Tanzania inclusive, is the poor financial base for small scale farmers particularly in rural areas where majority (about 80%) of population lives. It is now widely accepted that accessibility to financial services in rural areas is necessary for rural societies to get out of the poverty trap through investments and access to other economic opportunities (Satta, 2000; Ponte, 2002). In this regard, credit availability is often taken as a key element in modernization of agriculture as source of capital (Benjamin, 2012). Credits removes financial constraints, accelerates the adoption of new technology and facilitates integral parts of the process of commercialization of the rural economy (Satta, 2000; Ponte, 2002).

Furthermore, it is argued that, credit availability may increase farmer's ability to utilize more productive inputs and hence increased productivity through technological changes (Ashaolu *et al.*, 2011; Yazdani and Gunjal, 1998 & Mbata, 1991). In this view, cash spent on inputs reflects the amount of money required with regard to farm activities and hence the need for accessing financial services. Farmers who use improved seeds, inorganic fertilizers and other industrial agrochemicals require more cash to purchase inputs (Benjamin, 2012). This would force them to borrow since in rural areas modern agricultural inputs are obtained at high cost due to problems associated with remoteness and poor infrastructure (Ashaolu *et al.*, 2011).

Following the potential of SACCOS in providing easy access to credit among small holder farmers and failure of formal financial institutions like banks in providing credits to small holder farmers in rural areas, there has been strong emphasis and efforts among stakeholders to sensitize small scale farmers in rural areas to form savings and credit cooperatives society (SACCOS) so as to increase their access to financial services and improve their production which has a multiplier effect in improving rural livelihood (Dorsey, 2002). Recent statistics from Ministry of Agriculture, Food Security and Cooperative Development, indicate an increasing number of SACCOS throughout the country (MAFCD, 2009). Among the regions with largest proportional of SACCOS is Geita region with a total number of 380 SACCOS (RCDO, 2015).

Geita district being one of the latest districts to establish SACCOS with its history dating back to 7 years ago, is one of the leading districts in Tanzania with a total of 221 SACCOS (URT, 2009). However, despite this massive number of SACCOS, there are no empirical evidences to show how far do these SACCOS have contributed to the improvement of small scale farming activities by providing credit so as to buy the modern/improved inputs and eventually increases productivity and reducing poverty. This paper therefore, intends to give out the emperical evidencies on how SACCOS have contributed to the improved small-scale farming in the study area with special focus on impact of SACCOS on the use of improved agricultural inputs and productivity. The paper is in line with government programs such as National Strategy for Growth and Reduction of Poverty (NSGRP) which calls for increased access to micro financial services for subsistence farmers and promotion of sustainable community savings and credit schemes such as SACCOS and revolving funds (URT, 2005).

## **2.0 MATERIALS AND METHODS**

### **2.1 The study Area**

This study was conducted in two wards namely Kalangalala and Kasamwa wards in Geita District, Geita region. The district lies between 1000 meters to 1,300 meters above sea level and has a total population of approximately 758,115 people. The selection of Geita region and Geita district in particular was based on the fact that the areas are ranked high in number of SACCOS delivering services to marginalized population, small-scale farmers inclusive. In addition, the selection Kalangala and Kasamwa wards was done in consultation with District Development Cooperative Office on the basis of the existence of SACCOS operating in the wards.

### **2.2 Research design and sampling procedure**

A case study research design was used so as to give a unitary character of data being studied. A total of six villages namely Kasamwa, Ibada, Ihayabuyaga from Kasamwa ward and Shilabela, Katoma and Nyankumbu from Kalangalala ward were purposively selected. The small scale farming households residing in the named villages were categorized into two groups namely SACCOS and non-SACCOS members. Thereafter, 120 small-scale farming households (60 from each category) randomly selected were tracked to give the necessary information for this study.

#### **2.2.1 Data collection and Analysis**

Primary data were captured through interviews with respondents using semi-structured questionnaires, while checklist was used to collect information during focus group discussion with the key informants. In addition, Secondary data were obtained from respective SACCOS, Geita District offices, Ministerial level (MAFS), books and published and unpublished documents. The collected data was analyzed using the Statistical Package for Social Sciences (SPSS) program. In particular, descriptive statistics, were used to analyze the data. In particular, descriptive statistics were used to calculate frequency and percentages. In addition, t-test and chi-square test were used to compare mean and measuring the impact of SACCOS on farm labour used, use of improved farm inputs and crop yield among others between SACCOS and non-SACCOS members.

## **3.0 FINDINGS AND DISCUSSIONS**

### **3.1 Impact of SACCOS on the use of improved farm inputs**

This paper sought to establish the impact of SACCOS on the use of improved farm inputs. These were examined through the use of labour, improved seeds, fertilizers and industrial pesticides.

### 3.1.1 Farm Labour

The study investigated the type of labour used by SACCOS members and non- SACCOS members in their farm production activities. The results in table 1 shows that about half (49%) of non-SACCOS members use family labour while about half (52%) of SACCOS members use hired labour. Chi square results  $\chi^2$  indicated a significant ( $p < 0.01$ ) difference on the type of farm labour used between SACCOS members and non- SACCOS members. In this case, SACCOS members hired labourers in their farms more as compared to non-SACCOS members who used family labour for farm activities. This signifies that there is a greater likelihood of SACCOS members to use hired labour as input compared to non-SACCOS members due to the fact that SACCOS members had alternative way of diversifying income to be used for hiring labour for farm activities.

**Table 1: Source of labour in farming**

Type of farm labour	Respondents (%)		
	Non-members	Members	Total
Family labour	49.0	20	39.6
Hired labour	12	52.9	32.45
Family and hired labour	43	57	50

Farmers who use hired labour are expected to require more capital than those who use family labour ( $p < 0.01$ ). Labour charges are higher especially during periods of peak labour demand. Hence farmers who use hired labour need more cash than those who do not. On other hand, those who rely on family labour only require cash for inputs such as fertilizers, seeds and pesticides once deemed necessary for farm production. According to Vaessen (2001), farmers engaging to wage labour market are less likely to qualify as clients of formal credit source. Therefore type of labour used in the farm is observed to be one of the discriminating variables between SACCOS and non-SACCOS members.

**Table 2: Number of hired labour**

	Mean	N	Standard deviation	Standard error of mean
Non-SACCOS members	7	36	4.49	0.68
Members	6	67	4.76	0.59
Total	7	103	4.68	0.45

t-value (1.503) - Insignificant at 5% level of significance

Among those who used hired labour, it is interesting that there was no significant difference in the number of labours hired. The mean comparison tests presented in (Table 2) suggests that whoever decided to use labourers faced demand for seasonal activities during specific time in the season. Labourers were mainly hired during land preparation, planning and/or sowing, weeding and some during harvesting. Therefore, the number of labourers required depended on demand and it depends on whether the employers were SACCOS members or non- SACCOS members.

### **3.1.2 Improved seeds**

In the study area, both local and improved seed were used in crop production. In crops such as rice, maize, potatoes and fruits small scale farmers were using local seeds. Mainly obtained from from the previous harvests. However, some maize growers were also using improved seed varieties. On the other hand, most of the horticultural crop growers used both local and improved seeds whereby improved seeds used were mainly of tomatoes, cauliflower, cabbage, onions, water melon and cucumbers.

The findings in Table 3 show that about 66% of both SACCOS and non SACCOS members (40.7%) use improved seeds. Nevertheless, there was a difference in the type of seeds used between SACCOS members and non-SACCOS members at  $p < 0.05$ . For many rural households, it is general practice that they store seeds from previous harvest in order to minimize cost of purchasing seeds in coming season. Also farmers bought more or less similar type of seeds for cabbage, tomatoes, cauliflowers onions, water melon and cucumbers from nearby input shops. This imply that SACCOS members would have an opportunity of purchasing more improved seeds than non-SACCOS members due to the fact that they have an alternative way of getting fund from SACCOS.

### **3.1.3 Fertilizer use**

Regarding the use of fertilizer, the findings in Table 3 shows a significant difference ( $\chi^2 = 9.098$ ;  $p < 0.05$ ) in types of fertilizers used between SACCOS members and non- SACCOS members. The result shows that 83.3% compared to only 20% more SACCOS members used inorganic fertilizers than non SACCOS members. This suggest that agricultural credit improved the income of members and enabled them to buy and use inorganic fertilizers. It was also observed that relatively larger portion of (58.3% - 63.3%) smallholder farmers used both organic and inorganic fertilizers. These results are similar to findings by Ponte (2002) who also found that there was decrease in fertilizers use among farmers in Geita district due to high prices, lack of credit and market failures.

### **3.1.4 Pesticides use**

Results in table 3, shows that there was insignificant difference between SACCOS members and non-SACCOS members in the use of pesticides. However, the proportion of SACCOS members who used pesticides was higher (75%) compared to non- SACCOS members (63.3%). Insignificant differences between SACCOS members and non- SACCOS members in usage of pesticides suggest that use of pesticides is not influenced by credit but depend on incidence of pest/diseases attack. Farmers are forced to use pesticides once there is pest attack. With the exception of cabbage growers, the sample farmers reported low incidence of pest and diseases occurrence in crops. Some farmers were using

botanicals like. "Utupa" (*tephrosia vogelii*) and "Muarobaini" (*Azadiracta Indica*) that could be obtained locally. Generally the results suggest that farmers who are members of SACCOS are using improved pesticides than non-members. This could be due to their increased income.

### 3.1.5 Farm input costs

The results in Table 3 shows that there was significant mean difference at  $p < 0.05$  in the amount of money spent on modern crop inputs per season between SACCOS members and non-SACCOS members. Cash spent on purchase of agricultural inputs the household's average cash spent on purchase of inputs highlights the level of farm operations in terms of technology and modern agricultural input use. It is argued that, credit availability may increase farmer's ability to utilize more productive inputs and hence increased productivity through technological changes (Mbata, 1991; Yazdani & Gunjal, 1998). Cash spent on inputs reflects the amount of money required with regard to farm activities and hence can be one of the discriminating characteristics between borrows and non-borrowers of financial services. Farmers who use improved seeds, inorganic fertilizers and other industrial agrochemicals require more cash to purchase inputs. This would force them to borrow since in rural areas modern agricultural inputs are obtained at high cost due to problems associated with remoteness and poor infrastructure.

**Table 3: Impact of SACCOS on the use/purchase of farm inputs**

Variables	Description	Respondents		Chi-Square
		Non-members	Members (%)	
Crop inputs				
	Improved seeds	40.7	66	8.076*
	Organic fertilizer	66.7	30	9.098*
	Inorganic fertilizer	20	83.3	
	Pesticides	63.3	75	
Expenditure (TZS)	Farm inputs	50,476.13	104,234.74	

*Significant at 5% level of significance*

Generally, the findings on the impact of SACCOS on farm inputs implies that SACCOS members were more likely to secure credit for farm purposes and hence able to purchase inputs compared to their counterparts. This was also revealed during the survey whereby more than 50% of the respondents indicated that they requested credit solely for farming/ agriculture purposes. Modern agricultural inputs in rural areas are expensive due to factor associated to remoteness and market problems. Credit can therefore enable farmers meet the costs of these inputs.

### 3.2 Impact of SACCOS on Crop yield

The paper also thought to establish the impact of SACCOS on crop yield. In this case, some crops of economic importance in particular maize, beans, cabbage, potatoes, paddy and pineapple were selected to assess the impact of credit on crop production. Other crops such as green vegetables and spices were not selected due to difficulties to quantifying their yield levels as they were harvested and sold in small proportion. Hence, such crops were not in position to give actual figures on the quantities produced. The findings in Table 4 shows that SACCOS members harvested more maize (69%), potatoes (39%) and paddy (70%) compared to non-members. With the exception of tomatoes, SACCOS members had relatively higher yield than non- SACCOS members although the differences for maize, beans cabbage, potatoes and banana were not significant (Table 4). This has implication on level of inputs used for crop production. As presented earlier, there was significant difference in fertilizer use at  $p < 0.05$  but there was insignificant difference in usage of other pesticides between SACCOS members and non- SACCOS members.

**Table 4: Average yield of selected crops per season**

		Yields (in kg/acre)					
		Maize	Beans	Cabbage	Potatoes	Paddy	Pineapple
Non-members	Mean	450.41	178.90	1000.67	1890.80	867.06	760.20
	N	66	50	29	35	63	26
Members	Mean	531.56	243.41	1356.78	2365.46	1897.80	680.31
	N	69	46	27	39	70	19
	t-value	0.251	1.210	0.711	0.773	2.487	1.193

*Significant at  $p < 0.05$*

#### 3.2.1 Distribution of households by maize and paddy area cultivated

Results in Table 5 shows that large proportions of SACCOS members' households cultivated more acres of land for both maize and paddy compared to households with non- SACCOS members. The average areas of land under the two cultivated crops were 1.6 acres of maize and 2.3 acres of paddy for SACCOS members' households and 1.2 acres of maize and 2.3 acres of paddy for non- SACCOS members households. These low average cultivated acres of maize for non- SACCOS members households could be due to inadequate capital to purchase farm inputs like improved seeds, labour hiring, fertilizer, pesticides and herbicides. Households with SACCOS members were probably able to generate cash from sale of milk and meat that could be used to purchase inputs for maize and paddy production.

**Table 5: Distribution of households by maize and paddy area cultivated (acres)**

Crop	Farm size	Respondents (%)		
		Members(n=60)	Non- members (n=60)	Total
Maize:	1- 2 acres	61.6	83.3	72.5
	above 2 acres	38.4	16.7	27.5
Paddy:	1-2 acres	28.3	38.3	33.3
	above 2 acres	71.7	61.7	66.7

Significant at  $p < 0.05$

### 3.2.2 Maize and paddy yield

The findings on maize and paddy yield in Table 6 shows that households who are SACCOS members harvested more maize and paddy compared to households who are non-SACCOS members. Since households with larger areas under food crop cultivation had a higher probability of producing more food than those with smaller areas under food crop cultivation, SACCOS members households are likely to be more food secure than non- SACCOS members households. The findings further show that households with SACCOS members harvested more 945 kg of maize and paddy 2418 kg per household when compared to the households with non- SACCOS members that harvested 633 kg of maize and 2367 kg of paddy per household. Proportion wise, a high proportion of households with SACCOS members (60%) harvested more than 500 kg of maize compared to households with non-SACCOS members (51.4%) that harvested more than 500 kg of maize.

**Table 6: Maize and paddy yield in 2008/09 cropping season**

Crop	Farm yield	Respondents (%)		
		Members(n=60)	Non- members (n=60)	Total
Maize:	less than 500 kg	40.0	48.6	45.8
	500 – 1,000 kg	31.6	39.7	34.2
	Above 1,000 kg	28.4	11.7	20.0
Paddy:	Less than 500kg	16.6	8.3	12.5
	500 – 1,000 kg	8.3	25.0	18.3
	Above 1,000 kg	75.1	66.7	69.2

Source: Survey field data 2010

This suggests that households who are SACCOS members are likely to be more food secure compared to the households who are non-SACCOS members. The small quantities of maize and paddy harvested by the households with non-SACCOS members could be attributed to their limited opportunities of earning

money from SACCOS that would enable them purchase agricultural inputs like improved seeds, fertilizers, herbicides and insecticides.

Further, the paper sought to establish the quantities of harvested maize and paddy used or planned for consumption at household level. Findings in Table 7 shows that households with SACCOS members consumed little maize and paddy compared to households with non- SACCOS members. On average, households with SACCOS members consumed about 358 kg of maize and 807 kg of paddy consumed per household compared to 456 kg of maize and 1287 kg of paddy per household for households with non-SACCOS members in 2008. Likewise, SACCOS member's households had significantly low proportion of households that consumed more than 500 kg of own produced maize and paddy. This suggests that SACCOS members households are more likely to meet energy requirements from own produced food crops and hence more food secure than households with non- SACCOS members.

**Table 7: Distribution of households by quantities of harvested maize and paddy consumed at home in 2008**

Crop	Farm yield (kg/season)	Respondents (%)		
		Members(n=60)	Non-members (n=60)	Total
Maize:	Std Deviation	109.4	197	166.2
	less than 500 kg	58.4	78.3	68.3
	500 – 1,000 kg	38.3	21.7	30.0
	Above 1,000 kg	3.3	0.0	1.7
Paddy:	Std. Deviation	269.4	1733.1	1258.0
	Less than 500kg	1.7	6.7	4.2
	500 – 1,000 kg	56.6	73.3	65.0
	Above 1,000 kg	41.7	20.0	30.8

Regarding the quantities quantities of harvested maize and paddy sold, results in table 8 shows that nearly half of the sampled households in the study area sold their harvested crops. On average, households with SACCOS members sold almost five times more (about 1652 kg.) compared to 338 kg of crops from households with non- SACCOS members.

**Table 8: Distribution of households by quantities of maize and paddy sold in 2008/09 cropping season**

Crop	Proportion of selling (kg)	Respondents (%)		
		Members(n=60)	Non-members (n=60)	Total
Maize:	Std Deviation	9271.3	992.4	6598.6
	0	48.3	30.0	39.2
	1 – 500 kg	20.0	8.3	14.2
	501 – 1000 kg	20.0	20.0	20.0
	Above 1000 kg	11.7	41.7	26.6
Paddy:	Std. Deviation	1407.0	1716.7	1505.0
	0	58.4	25.0	41.7
	1 – 500 kg	26.6	13.3	20.0
	501 – 1000 kg	10.0	21.7	15.8
	Above 1000 kg	5.0	40.0	22.5

Furthermore, on average, households with non- SACCOS members sold slightly more harvested paddy of about 1480 kg compared to 1319 kg of harvested paddy for households with SACCOS members (Table 8). However, differences existed in the proportion of households that sold harvested maize and paddy in 2008/09 cropping season. Thus, irrespective of the harvested maize and paddy sold, the proportion of households which sold harvested maize and paddy was higher for households with SACCOS members (48% and 58%), respectively compared to households with non- SACCOS members (30% and 25%) for maize and paddy respectively. This implies that in non-SACCOS members the consumption is greater than production due to large number of members in the household.

#### 4.0 CONCLUSION AND RECOMMENDATIONS

##### 4.1 Conclusion

It is very important for the small-scale farmers to have an access to credit to cover the necessary costs during production process. The results generally observed that there is significant difference on the use of improved agricultural inputs between SACCOS members and non- SACCOS members. SACCOS members used relatively more inputs that were costly than non- SACCOS members. This suggests that credit has had impact on use of improved agricultural inputs hence the implication is that farmers who use credit services are most likely to use improved agricultural inputs and at least likely to meet recommended amounts. Furthermore, SACCOS members had relatively higher mean yield than non-SACCOS members although the differences for maize and paddy were not significant. All these facts were found to be accelerated by the ability of SACCOS member to have higher purchasing power to cover all necessary costs which emerged along the farming activities versus their counter parts (non-member of SACCOS). Therefore, SACCOS members were seemed to be in advantageous position

compared to non-members of SACCOS in farming activities, hence realized improved farming especially for small-scale farmers in the study area.

#### 4.2 Recommendations

It is recommended that all farmers, especially those who are producing in small-scale to join and engaged in rural microfinance schemes as they are recognized as the major agricultural financier in the rural settings. In addition, saving and credit co-operative societies are advised to reduce interest rates especially on agriculture loans in order to benefit many smallholder farmers. This is based on the fact that high interest rates is one of the major problem facing SACCOS members in Geita district.

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