

Empirical Study on Factors Effecting Banana Productivity from the Gender Perspective: A Case of Matombo SACCO in Tanzania

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Abstract

Agriculture plays an important role in the Tanzanian economy accommodating approximately 74% of the country's population and contributing 25% of the Gross Domestic Product (GDP). Despite the fact that majority of people in the country engage in agricultural production, the level of productivity remains low because of weak and unaccountable agricultural institutions, as well as socio-economic and cultural barriers. Low productivity in the banana sub-sector affects the well being of smallholder farmers and ultimately leads to food insecurity in the country. SACCOs' intervention in the respective sub-sector focuses on empowering farmers through the provision of financial and technical services so as to enhance productivity for the common good. This study assessed the role played by SACCOs in supporting the livelihood of male and female banana growers. Raw data were collected from 45 male members and 45 female members together with key informants through structured questionnaire and in-depth interview respectively. Content analysis was used for analyzing qualitative data while Statistical Package for Social Science (SPSS software) and Microsoft Excel was used for analyzing quantitative data. The study identified that the level of productivity among male was higher than their female counterparts. The results of multiple regression of the double log form showed that age, education, extension services and SACCOs' agricultural credit were highly statistically significant, implying positive influence on banana productivity for both male and female members. It was concluded that SACCOs played an essential role in improving banana productivity for their members; however, the discrepancy in productivity between male and female members was identified. Therefore, the study recommends that capacity building should be given the first priority for empowering female members in terms of their awareness in tapping the available socio-economic opportunities and skills enhancement.

Keywords: Banana Productivity, SACCOs' membership, Gender Parity.

1. Introduction

Agriculture plays an important role in the Tanzanian economy accommodating approximately 74% of the country's population and contributing 25% of the Gross Domestic Product (GDP) (URT, 2014). It is an essential sector for the sustainability of the nation's economy and attainment of food security. Through agricultural production, the majority of rural Tanzanians can increase their income and access different kinds of nutritious foodstuff. Therefore, it is evident that agriculture offers a pathway out of poverty for millions of smallholder farmers and service providers engaging in the value chain system.

Banana is an annual food crop employing more than 70% of smallholder farmers in the high-rainfall highlands and coastal areas (Kalyebara *et al*, 2007). In Tanzania, banana has a high rate of consumption since it possesses numerous health benefits such as subsidizing appetite, fighting obesity and reducing cholesterol in humans. Despite being marketable, banana productivity in the country is still low, as the average banana yield reaches 6.25 tons per hectare as opposed to the potential of 80 tons per hectare (FAO Report, 2012). According to Ndunguru (2009) pests and diseases, poor production practices and dominance of local varieties have substantially reduced yields. Mgbenka *et al* (2015) postulate that lack of credit facilities and inaccessibility to agricultural technologies limit efficiency in the banana sub-sector. In addition to financial constraints faced by banana growers, Agarwal (2012) articulates that gender differentials in food production reduces the output and affects the well-being of smallholder farmers in rural communities.

Gender inequality in accessing agricultural and financial services is one the barriers of agricultural development in rural communities. Rural women play crucial roles in agricultural activities and in increasing food and nutrition security. Inability to access resources and opportunities limits women's ability to enhance agricultural productivity and improve household income. Financial cooperatives can play essential roles in overcoming the barriers faced by women and supporting small agricultural producers. Their services enable women and men smallholders to secure their needs and entitlements in order to reduce income poverty and eradicate hunger (FAO Report, 2012). The establishment of Savings and Credit Cooperative Societies (SACCOs) enables smallholder farmers (both males and females) to mobilize their resources and access financial services in order to increase productivity and improve their livelihood status. Gasper (2013) pointed out that SACCOs play crucial roles in

capacity building, improving literacy, advocacy participation and information sharing.

Many Agricultural SACCOs accommodate both male and female members as they discourage all forms of gender discrimination. Such financial institutions offer loans and certain transactional facilities in order to promote agricultural production and improve the well being of farmers and other actors in the respective sector (Pipek, 2007). Mwakajumilo (2011) argues that cooperatives bring smallholder farmers together and enable them to mobilize capital, access technical services, increase productivity and ultimately improve their well-being. In addition, Maleko and Msuya (2013) reported that financial cooperatives create opportunities for male and female members to access resources such as credit, market facilities, and technology which stimulate production and raise their income.

The selected studies have revealed the essential role played by SACCOs' in supporting agricultural production in rural communities; however, their findings do not explore SACCOs' intervention in addressing gender equality and promoting banana production in rural communities. This study focused on examining the capacity of SACCOs' in addressing gender equality and promoting banana production in rural communities, where Matombo SACCO was chosen as the case study area. Specifically, a detailed comparative analysis on banana productivity between male and female members was made as well as the assessment of the contribution of institutional services on boosting productivity in the respective sub-sector among male and female farmers.

2. Materials and Methods

2.1 Description of the study area

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

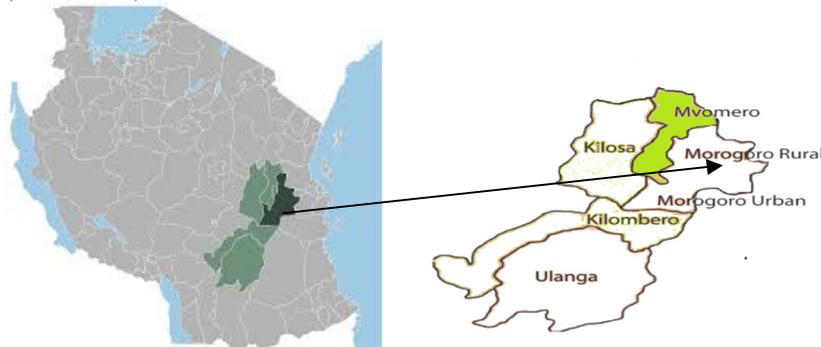


Figure 1: The map showing the study area (Morogoro district)

The study area was selected because of its suitable climatic condition which allows optimal agricultural production. Secondly, the district accommodates SACCOs' which directly support smallholder farmers living in marginalized communities. Financial services accessed from SACCOs enable farmers to improve agricultural practices and ultimately raise their income. Therefore, the generated information reveals objectivism on research issues which were examined and highlighted from different perspectives.

2.2 Research design

The study employed a cross-sectional design which involves interviewing a representative sample of a population at a single point in time. Babies (1973) describes that the design provides quick results and allows collection of data from groups of different characteristics. Also it has a high degree of accuracy and precision as it saves time and resources (Masunga, 2014).

2.3 Sampling and Data Collection procedure

The study used households as a sampling framework with two major categories; male and female households. Stratified sampling was used to select 45 male farmers and 45 female farmers whereas purposive sampling technique was employed for selecting key informants (technocrats and SACCOs' leaders). Both techniques were used purposely in order to ensure representativeness of the population sample and accuracy of the information obtained from the study area. A structured questionnaire and in-depth interview were used to collect primary data from the farmers and the key informants respectively. Secondary data were obtained from government publications and the respective financial cooperative society. Principally, Matombo SACCO was selected because of its capacity to address gender issues by creating a favorable environment for both male and female members to access financial services and different kinds of financial and entrepreneurship training in order to stimulate agricultural production and improve farmers' household income.

2.4 Data Analysis

Descriptive and inferential statistics including frequency, percentages, standard deviation, mean and graphs were used to describe socio-economic characteristics of male and female members and their levels of productivity. A regression model of double log form was also used to estimate factors and determinants of banana production for male and female as employed by Ayoola *et al* (2011) and Ehsan *et al* (2015). The empirical form of double log model is given as:

$$\ln(Y_i) = \beta_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + \varepsilon_i \dots\dots\dots (1)$$

Where

Y_i = Banana productivity, β_0 is a constant term, β_{1-8} are the coefficients need to be estimated and ε_i is the error term

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

X_2 = Education *Continues* (Number of schooling years)

X_3 = Family size. *Continues* (Number of household members)

X_4 = Farming Experience. *Continues* (Number of years)

X_5 = Market Accessibility. *Dummy* (1 = Local Market; 0 = Urban Market)

X_6 = Extension Services. *Dummy* (1 = accessed; 0 = otherwise)

X_7 = Land acres. *Continues* (number of acres)

X_8 = SACCOs' credit. *Continues* (Amount of money received from the organization as a loan)

3. Results and Discussions

3.1 SACCOs' intervention in promoting Gender Issues

In Tanzania, agriculture continues to be the main- stay of the economy as it employs about 74% of the population and possesses strong consumption linkages with other productive sectors. According to URT (2014), the agricultural sector employs more than 60% of its work force. Simbakalia (2012) points out that unequal access to opportunities and assets hinders the prosperity of the agricultural sector hence lower income generation among the marginalized rural women.

The presence of Savings and Credit Cooperative Societies (SACCOs) in the agricultural sector provides a forum for both male and female to access credit for improving agricultural practices and ultimately attains food security. Also SACCOs' services enable their members to invest wisely in non-agricultural activities and raise household income which leads to the improvement of other livelihood aspects. According to Bwana and Mwakujonga (2013) SACCOs are important micro financing institutions for mobilization of financial resources for various development activities particularly in rural areas where the majority of people earn their livelihood from agriculture.

The study identified that Matombo SACCO provides financial services to 317 male members and 241 female members. The financial cooperative provides agricultural credit to more than 100 members where the number of female members reached 40% of the beneficiaries. In addition, SACCOs' members continue to access trainings on financial management, entrepreneurship and marketing from the Local Government Authorities and other organizations (partners). Furthermore, the management of Matombo SACCO involves both male and female members. All management organs including the supervisory committee, the board of directors and the credit committee are composed of male and female members.

This implies that SACCOs have removed gender-based constraints by creating a favorable environment for their members to access productive resources which are vital for stimulating agricultural production. Both male and female members can access their services smoothly based on the rules and regulations governing the organization. Therefore, the establishment of financial cooperatives in rural Tanzania has been a means of reducing gender gap in the development process by creating opportunities for the marginalized farmers (both men and women) to utilize their resources effectively and efficiently for the common good.

3.2 Basic Statistics of Male and Female Participants for Banana Production

This study involved both male and female banana growers as members of Matombo SACCO. Results in Table 1 depicted that the mean age of male farmers was 41.2 with a standard deviation of 6.91 whereas for female respondents was 42.2 with a standard deviation of 9.71. This implies that both categories of respondents were in their productive age and thus economically viable for increasing agricultural productivity.

The educational level of SACCOs' members denotes that the mean value of schooling for the male farmers was 8 years with a standard deviation of 4.67 whereas the mean for female banana growers was 7.23 with a standard deviation of 3.83. These findings imply that most of the SACCOs' members are literate and thus capable of adopting new agricultural innovations that could enhance productivity and ensure higher income at the household level.

Table 1: Basic Statistics of Male and Female Participants in Banana Production

Variables	Description of variables	Male (N=45)		Female (N=45)	
		Mean	SD	Mean	SD
Age	Number of years	41.2	6.91	42.2	9.71
Educational Status	Years of Schooling	8.28	4.67	7.23	3.83
Family Size	Number of people in the household	4.09	1.37	3.47	1.01
Land size	Number of acres used for banana production	4.06	0,83	3.88	0.85
Farmers Experience	Number of years in farming	3.61	1.63	3.23	1.03
Extension Services	Dummy (1= accessed, 0= not accessed)	2.17	0.81	1.97	0.77
Market Accessibility	Dummy (1=local, 0= urban)	0.62	0.48	0.88	0.33
Banana Productivity	The output attained in metric tons per acre	4.02	1.35	3.54	0.87

Source: Field Survey, 2017

Furthermore, the results revealed that the mean values together with the standard deviation of land size, extension services and farmers' experience for male respondents higher than their counterparts. Accessibility to such opportunities brought a positive impact on productivity for male respondents. The level of productivity among male farmers was found to be higher compared to their female counterparts.

Key informants reported that the discrepancy in productivity came into being because of undesirable socio-cultural and economic practices which allowed men to dominate in the value chain system. According to Bindlish *et al* (1995) and Njuki *et al* (2006), women's lower access to socio-economic and institutional resources has a negative impact on productivity and income.

3.3 Socio-economic factors influencing banana production among male and female farmers

The multiple regression of the double log form was used to test the influence of socio-economic parameters of male and female members on banana productivity. The results depicted that age was highly significant implying that it would greatly influence banana productivity among male and female farmers. The level of productivity among the aged farmers was higher than the young farmers due to their experience and commitment to improving agricultural practices. Similarly, Mamuye (2010) reports that the age of farmers remains the major determining factor enhancing banana productivity in rural communities.

Table 2: Socio-economic factors affecting Banana productivity by Gender

Variables	log-log model for Male members (SD)	log-log model for Female members (SD)
Intercept	15.7** (1.06)	18.4*** (0.04)
Socioeconomic variables		
Age (Continues)	97.7*** (0.23)	48.5*** (0.12)
Education (Continues)	65.6*** (0.68)	2.16** (0.68)
Land Size (Continues)	-12.6 ^{NS} (0.94)	-2.32 ^{NS} (1.28)
Family Size (Continues)	-16.5 ^{NS} (1.85)	23.4*** (1.02)
Faming Experience (Continues)	1.24** (0.64)	-0.72 ^{NS} (0.25)
Market Accessibility (Dummy)	41.2* (2.01)	-0.62 ^{NS} (0.45)
Extension Services (Continues)	1.71*** (0.22)	1.64** (0.14)
SACCOs' credit (Continues)	10.6*** (0.02)	5.55*** (1.05)

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

The findings also indicated that education was a highly significant variable implying positive influence on banana productivity for both male and female respondents. The level of farmers' education determined the competency in banana production. Farmers with higher educational status produced more than their counterparts. Similar findings were reported by Bathan and Lantican (2010) who found that educated banana growers had yield advantages over their counterparts, provided they applied the knowledge and skills on farming acquired over time.

The results indicated that agricultural extension service was positively signed and statistically significant implying a positive relationship between the service and banana production. The output among the farmers who accessed extension services regularly was higher than their counterparts who rarely accessed these services. Similarly, Fliegel (1993) and Sinkaye (2005) articulate that agricultural extension services improve agricultural productivity and promote household food security. Extension services provide farmers with important information on patterns in crop prices, new seed varieties, crop management and marketing.

The results from Table 2 depicted that SACCOs' credit was positively signed and statistically significant implying positive influence on productivity. Farmers who accessed agricultural credit could procure inputs, adopt new technologies and finally increase productivity in the banana sub-sector. According to Odemiro (2013) credit facilities enable banana growers to increase productivity through the accessibility and proper use of agricultural technologies and institutional services

Market accessibility was significant for male farmers and insignificant for their counterparts whereas family

size was highly significant for female members and insignificant for male banana growers. These findings imply that family size has a positive impact on banana productivity. The level of productivity in female households increases, as the number of household members increases. Accessibility to profitable markets encourages male farmers to allocate more resources for enhancing productivity and improving their income. The inability of female farmers to access profitable markets comes into being because of time constraints, limited market information, lack of reliable transport system and other essential facilities such as toilets, child-care facilities and toilets.

4. Conclusion and Recommendations

The paper examined the performance of SACCOs in addressing gender equality among male and female members who engage in banana production in Morogoro district. Through SACCOs' operations, male and female members can equally access financial services for the sake of increasing banana production and improving their household income. However, the study identified a gap in productivity between male and female members where male bananas output was reported to be higher than their female counterparts.

Based on the conclusions, the study recommends that more training on gender issues should be offered to SACCOs' leaders and their members as a means of creating a favorable environment for empowering female farmers to participate fully in boosting agricultural production in rural areas. This could ensure sustainability of rural SACCOs and better living environment for their members as well as entire rural communities. Also, policies which address gender issues should be well implemented by the responsible institutions in order to ensure equality and harmony in the attainment of socio-economic and political development.

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References

- Agarwal, B., (2012). Food Security, Productivity and Gender Inequality; IEG Working Paper No. 314
- Ayoola, B.J., (2015). Comparative Economic Analysis of Tomato (*Lycopersicon esculenta*) under Irrigation and rain fed systems in selected local government areas of Kogi and Benue States, Nigeria. *Journal of Development and Agricultural Economics*, 6, 466-471
- Babbie, E.P. (1973). Survey Research Methods. California: Wadsworth Publisher Company Inc.
- Babbie, E. & Mouton, J., (2005). The Practice of Social Research. Cape Town: Oxford University Press
- Bathan, B.M. & Lantican, F.A., (2011). Factors Affecting Yield Performance of Banana Farms in Oriental Mindoro, Philippines; J.ISSAAS Vol.16 No 1:110-120.
- Berik, G., (2008). Growth with Gender inequity: another look at East Asian development. In Social Justice and Gender Equity: Rethinking Development Strategies and Macroeconomic Policies, Berik, Rodgers and Zammit, eds. London: Routledge.
- Bindlish V., Evenson, R., & Gbetibouo, M., (1993) Evaluation of T&V-based extension in Burkina Faso. World Bank Africa Technical Department Paper No. 226. Washington DC: World Bank
- Bwana, K.M., & Mwakujonga, J., (2013). Issues in SACCOS Development in Kenya and Tanzania: The Historical and Development Perspectives. Developing Country Studies [Online] Available: www.iiste.org
- Chidi, I., Anozie, R.O., & Nneji, P.C., (2015). Analysis of Socio-Economic Factors and Profitability of Rice Production among Small scale Farmers in Ebonyi State. *Journal of Agriculture and Veterinary Science (IOSR-JAVS)*, 8, 20-27.
- FAO Report, (2012). Banana Production Systems at risk; effectively responding to banana wilt disease in the Great Lakes Region [Online] Available: <http://www.fao.org>
- FAO Report, (2012). Agricultural Cooperatives and Gender Equality [Online] Available: <http://www.fao.org/docrep/017/ap669e/ap669e.pdf>
- Fliegel, F., (1993). Diffusion Research in Rural Sociology. Westport USA: Greenwood.
- Gasper, G., (2013). Contribution of Saving and Credit Cooperatives to Women Development and Poverty Eradication in Tanga City Council: A Case of Tangamano, Muwasita and Seroni SACCOs: The Open University of Tanzania, Dar es Salaam -Tanzania
- Girabi, F. & Mwakaje, A.E.G., (2013). Impact of Microfinance on Smallholder Farm Productivity in Tanzania: The Case of Iramba District. *Asian Economic and Financial Review*, 3, 227-242
- Kalyebara, R., Nkuba, J.N., & Mgenzi, S.R.B., (2007). Overview of the Banana Economy in the Lake Victoria regions of Uganda and Tanzania. p.73-78: (eds) by Smale, M., and Tushemereirwe, W., (eds.) in the

- Economic Assessment of Banana Genetic Improvement and Innovation in The Lake Victoria Region of Uganda and Tanzania; IFPRI, Washington D.C.
- Kilimo Trust, (2012), Banana Value Chain(s) in the EAC: Consumption, Productivity and Challenges [Online] Available: [http:// www.kilimotrust.org](http://www.kilimotrust.org)
- Koyenikan, M.J.,(2008). Issues for Agricultural Extension Policy in Nigeria. *Journal of Agricultural Extension*, 12,52-62
- Kwai, D. M., & Urassa,K.J., (2015). The Contribution of Savings and Credit Cooperative Societies to Income Poverty Reduction: A Case study of Mbozi District, Tanzania; *Journal of African Studies and Development*, 7, 99-111
- Maleko, G., & Msuya, R., (2015). Women Participation in Cooperatives – Challenges and Prospects. The Case of Selected SACCOs and AMCOs in Kilimanjaro and Arusha Regions Tanzania, East Africa. *Journal of Business Administration and Education*, 7, 81-111
- Masunga, W.A.,(2014). Assessment of Socio-Economic and Institutional Factors Influencing Tomato Productivity Amongst Smallholder Farmers: A Case Study of Musoma Municipality; Sokoine University of Agriculture, Morogoro-Tanzania.
- Mgabenka, N. R.,Mbah, N.E., & Ezeano, I.C., (2015). A Review of Small holder Farming in Nigeria: Need for Transformation. *Agricultural Engineering Research Journal* ,5, 19-26
- Mikwamba, E., (2004). Know more about SACCO. Lilongwe: MUSCCO
- Mwakajumilo, S. L.I., (2011) The Role of Microfinance Institutions in Saving Mobilization, Investment and Poverty Reduction: A Case of Savings and Credit Cooperative Societies (SACCOs) in Tanzania from 1961-2008. West Indies: St. Clements University
- Mamuye, N., (2016). Statistical Analysis of Factor Affecting Banana Production in Gamo Gofa District, Southern Ethiopia. *Engineering and Applied Sciences* [Online] Available: <http://www.sciencepublishinggroup.com/j/eas>
- Murthy,D.S., Sudha, M., & Dakshinamoorthy,V., (2009). Technical Efficiency and its Determinants in Tomato Production in Karnataka, India: Data Envelopment Analysis (DEA) Approach. *Agricultural Economics Research Review*, 22, 215-224
- Njuki, M.J., Kihyo, B.M., & O'kingati, F., (2006). Productivity Differences between Male and Female Managed Farms in the Eastern and Central Highlands of Kenya. Contributed paper prepared for presentation at the International Association of Agricultural Economists Conference, Gold Coast, Australia, August 12-18, 2006.
- Piprek, G., (2007). Linking with Savings and Credit Cooperatives (SACCOs) to expand financial access in rural areas: A Case study of CRDB Bank in Tanzania, FAO – United Nations
- Quisumbing, A.,(1996). Male-female Differences in Agricultural productivity. *Methodological Issues and Empirical Evidence*. *World Development*; 24, 1579-1595.
- Saunders, M., Lewis, P., & Thornhill, D., (2007). *Research Methods for Business Students*, 4th Edition. London: Pearson Education Prentice Hall
- Sharrock,S.,& Frison,E.(1998). Musa Production around the world-trends, Varieties and Regional Importance. *INIBAP Annu.Rep*, 42–47
- Simbakalia,L.J., (2012).The Role of Financial Sector in Agriculture Development and Industrialization. ESRF Policy Brief [Online] Available: www.esrf.or.tz
- Sinkaye, T.,(2005). Agricultural Extension Participatory Methodologies and Approaches in Agricultural Extension in Nigeria. *AESON*, 220-233
- Wanyama, F.O., Develtere,P., and Pollet, I., (2008). Encountering the Evidence: Cooperatives and Poverty in Africa: WP-SCE 08-02.
- United Republic of Tanzania, (2014), Speech from President Jakaya Kikwete at China Agriculture University [Online] Available: http://news.cau.edu.cn/art/2014/10/23/art_8769_316509.html