Cooperative membership and Ginger Productivity in Same District in Tanzania

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List of Acronyms

TZS	Tanzania Shilling
URT	United Republic of Tanzania
MAFC	Ministry of Agriculture, Food Security and Cooperatives
BRN	Big Result Now
ITC	International Trade Centre
ICA	International Cooperative Alliance
DCO	District Cooperative Officer
AEO	Agricultural Extension Officer
TOAM	Tanzania Organic Agriculture Movement
Faida MaLi	Faida Market Links
COVID 19	Corona Virus Disease 2019
SACCOS	Saving and Credit Cooperative Societies
AMCOS	Agricultural Marketing Cooperatives Societies
DAICO	District Agriculture, Irrigation and Cooperative Officer
NBS	National Bureau of Statistics

Abstract

In most developing countries, small-scale farmers are urged to form and join cooperatives predominantly to address production and marketing restraints that deter an increase in profits and improvements in their livelihoods. By using a crosse-sectional data of 100 small-scale ginger growers and 4 key informants in Same district in Tanzania, this study investigated the contribution of cooperative membership in enhancing ginger production. The results from a probit model examining the factors determining participation in cooperatives suggest that the probability of ginger farmers joining the cooperative increases with age and land ownership status. The estimates from a linear regression model analysing the effect of cooperative membership on the quantity of per hectare ginger production show that cooperative membership has a positive and significant effect on ginger production indicating that farmers organized into cooperatives perform better in the production than those who are not members. The information obtained from key informants unravels the ways members benefit from the cooperative meanwhile showing the challenges that a cooperative may encounter in achieving its goals.

The results in this study advocate for immediate and deliberate efforts and mechanisms to increase farmers enrolment in cooperatives, improve members' benefits and address existing cooperative's challenges as important areas for cooperative sustainability and attraction to new members.

Relevance to Development Studies

Poverty is among the major development challenges and considerably high in rural areas where many of the residents depend on agriculture as a source of their livelihood. Most farmers are engaged in subsistence agriculture and face a lot of challenges that hinder them from achieving food security and realizing profits. Lifting people out of poverty in rural areas requires directing supports and initiatives to main economic activities such as agriculture.

According to Hossain et al. (2019), cooperatives can be used as instruments that help to address farmers problems and provide an imperative model of tackling several development challenges that exist among the poor and vulnerable farmers. This current study highlights the advantages of membership in cooperatives and the challenges faced by cooperative members. The concerns argued in this study combined with what was presented in the

existing literature, aid to describe the contribution of cooperatives in development, especially in alleviating poverty through improving agriculture production. Thus, if expansion and improvements in cooperatives would help in addressing development challenges in different parts of the world especially in rural areas.

Keywords

Agricultural cooperative, Ginger production, Smallholder farmers, Mamba Ginger Growers Rural Cooperative Society, Same district, Tanzania

Chapter 1
Introduction

The backbone of many African economies is attributed to the agricultural sector. Kimaro et al. (2015) argue that approximately 25 to 40 per cent of the Gross Domestic Product of many Sub-Saharan Africa (SSA) countries comes from the agricultural sector. In Tanzania, for instance, the agricultural sector not only contributes 30% of all export earnings but also employs about 75% of the population (Chongela, 2015) that mostly live in rural areas and depend on agriculture as the source of their livelihood. Much of the earnings from the agricultural sector are generated from rural areas where small scale farming dominates agricultural production with less use of modern technology for production. Due to this contribution of the agriculture sector to the national economy and rural livelihoods, the government of Tanzania has put much effort to promote and improve small scale farmers organizations to enhance agricultural production. For example, Tanzania promoted agricultural cooperatives among cash crop growers in the 1960s. The country also passed several agricultural-related policies which aimed at promoting and enhancing the agricultural sector such as the National Agricultural Policy of 1983 and 2013 (Gondwe, 1986; MAFC, 2013). Apart from these policies, in 2009 and 2013, the government promoted the agriculture sector through various initiatives such as "Agriculture First" (Kilimo Kwanza) and Big Result Now (BRN) respectively (MAFC, 2013).

Moreover, the agricultural sector plays a significant part in enhancing farmers and household income and promoting rural development. For instance, in rural Tanzania such as Kilombero district, more than 66% of the farmer's household income comes from wetlands agricultural activities (Rebelo et al., 2010). Farming activities are the source of income for many farmers living in the rural area of Tanzania. Farmers invest in the rural area so that they can provide for themselves and their families. Income from cash crops is also used to support other important needs such as health and education. For these reasons, the role of smallholder farmers in increasing agricultural production and exports cannot be understated. In Tanzania, small scale farmers are heavily engaged in the production of cash crops such as coffee, sisal, tea, tobacco, and cashew nuts. Besides cash crops, small scale farmers also produce staple food crops such as maize, rice, cassava, and potatoes.

In recent years, the increasing trends in the global demand for spices have emphasized the need for increased production of spice crops such as ginger (ITC, 2014; Lamba et

al., 2015). This increase in demand has shifted the production trajectory of smallholder farmers to spices production such as ginger. Despite the shift, often, smallholder farmers face numerous challenges ranging from limited access to agricultural marketing information, improved inputs, good extension services, and proper and adequate policy frameworks to cater for their needs (Salami et al., 2010; Sieber, 2015). Thus, to enhance crop production and increase farm earnings, smallholder farmers have opted to participate in voluntary organizations such as farmers associations and cooperatives. The associations and cooperatives aim at enhancing farmers collective bargaining power and act as centers for acquiring skills, knowledge, improved inputs, and market information (Abate et al., 2014).

Out of many recently established cooperatives among small scale farmers, Mamba Ginger Growers Rural Cooperative Society Ltd is one that pools together numerous smallholder ginger growers in Same district. According to Same District Agriculture, Irrigation and Cooperative Officer (2020), Mamba Ginger Growers Rural Cooperative Society Ltd was formed in 2008 by 350 smallholder ginger farmers from three wards namely Myamba, Mpinji, and Bwambo under the help of the Same district council and the development partner agent called Faida Mali. The objectives of the cooperative are to enhance the quality and quantity of ginger produced through the provision of extension services, access to credit, and access to inputs such as quality ginger sets (cultivars) and fertilizers. The cooperative also aims to increase access to markets through the provision of market information, building a ginger factory for processing and packaging of ginger for value addition (Same DAICO, 2020). Currently, the cooperative has experienced a marked increase in the number of members reaching 612, indicating the desire from ginger farmers to curtail their production shortfalls and marketing barriers through cooperatives. Following the formation of a cooperative and the increased number of farmers joining it, the production per hectare has increased from 6 metric tons in 2007 to nearly 10 metric tons in year 2019, with total district ginger production of 19,800 metric tons and cultivated land of 1,650 hectares in 2019, farmers still need to improve production to attain 20 metric tons per hectare like other farmers in Indonesia and China (Same DAICO, 2020).

1.1 Problem statement

In Tanzania, ginger production contributes to increasing livelihoods and income among many rural dwellers. In recent years the cultivation of ginger is highly promoted for both local markets and export purposes. This is attributed by reported increase in demand in local and international markets. As producing areas, Same district is one of the areas that produce

a significant amount of ginger in Tanzania. According to ITC (2014), Same district alone produced 12,000 metric tons of ginger per annum which account for 70% of the total ginger produced in Tanzania. This significant volume of ginger has influenced the formation of a smallholder farmers' cooperative. Currently, Same district has 28 agricultural cooperatives that unite many farmers for easing access to market, credits, and agricultural inputs (Same DAICO, 2020). However, only one cooperative, among these, called Mamba Ginger Rural Growers Cooperative Society deals with ginger production and currently has 612 members.

Despite this volume, ginger production in Same district still faces numerous challenges that contribute to low yields. Mmasa (2017) reported that smallholder ginger growers in Same district lack markets for their produce, have an inadequate supply of modern inputs, lack modern agronomic practices, and encounter limited access to credit which to a large extent contributed to the low production of ginger per unit land and farm revenue.

One of the proposed solutions to tackle the challenges has been to advise all farmers to group themselves into cooperatives to combine their efforts through mutual help which has led to most farmers of ginger in Same district to form one big cooperative. Many studies have investigated the contribution of cooperatives in the cultivation of crops such as coffee, cashew nuts, and sunflower; to mention a few; and found that cooperatives played an important role in increasing production through access to inputs and technological innovation (Mazzarol et al., 2013; Sizya, 2001).

Most of the literature focused on factors affecting ginger production and the contribution of cooperatives in the production of other crops but little is understood on the contribution of cooperative membership in ginger production. Therefore, this research aims to investigate the contribution of cooperative membership on ginger production in Same district in Tanzania.

1.2 Research Aim and Questions

The main purpose of this research is to contribute to the knowledge gap by investigating the contribution of cooperative membership to ginger production among smallholder ginger growers in Same District.

1.2.1 Research Questions

1. What are the factors influencing smallholder farmers to join Mamba Ginger Cooperative in Same district?

2. Are there benefits to farmers membership to Mamba Ginger Growers Rural Cooperative Society?
3. Does cooperative membership have an effect on the quantity of ginger produced?
4. What are the challenges encountered by Mamba Ginger Growers Rural Cooperative Society in achieving its goals?

1.3 Relevance and Justification

There are several regions in Tanzania where ginger is produced. However, Same district is the leading ginger producing area in Tanzania. Existing evidence shows that 70% of the total ginger production of Tanzania comes from Same district and it is also becoming the learning hub for other areas that wish to start ginger production (ITC, 2014). While there are several cooperatives of smallholder farmers in Tanzania such as cooperatives for coffee growers, sisal, cashew nuts, tea, and tobacco (Rwekaza and Muhihi, 2016), the cooperatives for the spice growers such as ginger are very new and limited in Tanzania. This intrigued me to focus my research on Same district where a cooperative for smallholder ginger growers exists. So, there is an importance for policymakers to know the contribution of cooperatives in such area for more promotion and development.

Therefore, the results of this study will inform policymakers, ginger stakeholders both from government and private organizations, and actors in agriculture mainly in the ginger subsector on the economic and social effect of establishing and strengthening ginger cooperatives for the economic welfare of small-scale ginger farmers. Hence, this would result in attaining poverty reduction, food, and nutritional security by enhancing ginger production to offset the demand gap in the market.

1.4 Scope and Limitation

In accomplishing the purposes of this study, the research encompassed three wards namely Myamba, Bwambo, and Mpinji in Same district. Accordingly, 100 member and non-member smallholder farmers of Mamba Ginger Rural Cooperative participated in the survey. This study was restricted to Same district as among the areas in Tanzania where smallholder ginger farmers are organized into the cooperative. So, this study focused on how cooperatives enhance ginger production by interviewing smallholder ginger farmers both members and non-members of Mamba Ginger Growers Rural Cooperative Society and supplemented with information collected from key informants.

The findings of this study are limited to Same district, so the results cannot be used for generalization because other areas have different characteristics which might produce different results when the same research would be conducted. Further, due to COVID-19 pandemic and the limited available time for collecting data provided little chance of using more respondents that in fact could improve the results since the increase in sample size increases the chance of obtaining reliable estimates. However, I was unable to conduct a focus group discussion and use large number of respondents. Therefore, given COVID-19 pandemic situation in Tanzania during data collection, the researcher managed to collect data from 100 smallholder farmers (members and non-members of the cooperative) and 4 key informants.

In terms of secondary information, it was difficult to access information on ginger production in the Tanzanian context due to limited existing studies on the ginger crop.

1.5 Organization of the Paper

This research paper comprises five chapters. The first chapter introduces the study and describes the design used. The second chapter discusses the theoretical framework and literature review on the concept of cooperative, social capital theory, agricultural cooperative theory, and cooperative structure in Tanzania as empirical evidence from other scholars. The third chapter discusses the research methodology used for the study. Chapter four discusses the findings of the study while chapter five concludes the paper by discussing the findings and providing recommendations to cooperative leadership and different agricultural stakeholders to enhance cooperatives and ginger production.

Chapter 2
Theoretical Framework and Literature Review

This chapter discusses the cooperative concept as defined by different scholars and organizations, then social capita with component of trust as presented in the social capital theory and how contributes to the formation of the cooperatives. Aftermath, the discussion on a cooperative theory and how cooperatives act as the link between farmers and buyers, and between farmers and input suppliers. Last, this chapter discusses the empirical evidence from research studies conducted in different areas on how cooperatives influenced the agricultural production.

2.1 Cooperative Concept

The term "cooperative" has been defined by different scholars based on the context and intention underpinning its formation such as consumer cooperatives, Agricultural Marketing Cooperatives, housing cooperatives, and Saving and Credit Cooperative Societies (SACCOS). For example, according to Porter and Scully (1987: 494), cooperatives are referred to as "voluntary closed groups in which the decision making and risk-bearing functions lie in the membership, and decision management responses in the manager, who represents the principal's interests". The intuition of the definition is rooted in the freedom of the members to join or leave the cooperative and the position of the members in deciding matters related to their organization. Torgerson et al. (1998) defined cooperative as the social movement of free farmers working together to improve and safeguard their position in agriculture production and marketing. Farmers in the cooperative collectively increase their bargaining power in determining the prices of their produce and access to good markets easily that ultimately improve their farm revenue than working individually.

Moreover, the International Cooperative Alliance (1995) extended the meaning of cooperatives "as an autonomous association of people united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly-owned and democratically-controlled enterprise organized and operated on cooperative principles". This definition encompasses the areas that have been touched by definitions from other proponents of cooperatives, however, ICA included other areas such as culture. According to ICA, the cooperative is governed under seven globally recognized principles which are "voluntary and open membership; democratic member control; member economic participation;

autonomy and independence; provision of education, training and information; cooperation among cooperatives; and concern for the community."

This study employed the concept of cooperative as suggested by ICA as it includes both economic and non-economic benefits such as social cohesion which has been experienced among the members of cooperative and how it contributes to the operations of the cooperatives in Same district.

2.2 Social capital Theory

Social capital is found in the connections between individuals, and it facilitates productive and developmental activity in the same way that physical and human capital does (Coleman, 1988). According to social capital theory, social relations are resources that may support individuals in building up human capital (Bizzi, 2015) within organizations and contributes to their growth and sustainability.

The designation and categorization of various forms that social capital take is a subject of great discussion but a fairly straightforward approach and one that is relevant for this study is that by Aldrich (2012). According to Aldrich (2012), there are three forms of social capital. The first is the bonding social capital, which depicts the ties that bind people of a society based on the values of collaboration, reciprocity, and trust. This type of social capital enables members of a group to work together to assist each other in times of crisis. For the case of the smallholder farmers, bonding social capital led to form cooperatives to find solutions to existing challenges in their production. The second kind is the bridging social capital, which connects members of one group or community with members of other groups or communities. Connections to larger social and economic resources, as well as other external assets, are made easier by bridging social capital, which contributes to the group's resilience to shocks and other derailing factors. Connecting social capital is the third category and it consists of dependable social networks that interact beyond the official borders in society. The connecting social capital is viewed as a vertical link between a network and a certain sort of power or authority, and it is critical for economic growth and resilience since it provides knowledge and resources that may be lacking in a given community (Aldrich, 2012).

A high level of social capital can be considered as the essential condition for the formation of cooperatives. At the establishment stage, the level of social capital in a cooperative is high and it exists because of interpersonal relationships created from the informal social connections among the members due to trust, however, the continuation of the trust between members and their cooperative leadership depends on if their expectations are met. Thus, trust among the farmers is important before they decide to put in their resources in

the cooperative. Therefore, the formation of the cooperative requires a high level of relational social capital that is grounded in trust among farmers.

The social capital theory will be employed in discussing how trust brings farmers together and collaborate in addressing their challenges, and various benefits derived from the cooperative membership among farmers by not only cross-examining the trust of members to the cooperative in Same district but also conceptualizing the social assistance among members themselves.

2.3 Agricultural cooperative Theory

This study employed a theoretical approach grounded on the agricultural cooperative theory as discussed in Nourse (1992) and LeVay (1983). Both authors have shown the core reasons of farmers to voluntarily form agricultural cooperatives particularly agricultural marketing cooperatives were their desire to increase their market bargaining power and enhance productive resources-output supply chains. This in turn stimulates production, increase farm revenue to the members and fasten both developments of the rural economy and poverty reduction. The study attempted to examine the contribution of a cooperative on ginger production with emphasis on the economic structure of the cooperatives and their role in the marketplace. The assumption is that presence of the cooperative enhanced access to productive resources, credit, and marketing of ginger production which in turn enhanced ginger production.

In addition, the theory expounded that "cooperatives may seek long term security, perhaps in negotiating contractual terms with a supplier or a seller which will not necessarily affect prices but will improve some aspect of services, information or product differentiation" (LeVay, 1983:13). These contracts play a role in protecting farmers against price fluctuation and ensuring the availability of the market for the agricultural produce even if the markets are flooded with the same agricultural produce. However, when agricultural produce is scarce, which in one way or another makes the price shoot up, farmers are not in the position to tap this advantage.

Furthermore, Helmberger and Hoos (1965) show that besides the core aim of cooperatives on bargaining in the market to strengthen the terms of trade for farmers, they also play a vital role in enhancing production efficiency, negotiating contracts, and avoiding buyers from practising procurement actions that are against farmers' benefits. The cooperatives act as the link between farmers and modern input suppliers and speed up the adoption of

new technology that has become the solution to many production challenges encountered by smallholder farmers.

2.3.1 Structure of Cooperatives

Cooperative is built under an organisational structure that differs from other private owned economic entities due to differences in objectives and context of its formation, although there are some commonalities in an administrative position such as manager that appears in both. The establishment and structure of agricultural cooperatives are grounded on the joint ownership of resources that align with the cooperative principles described in the "Rochdale principles of cooperatives, England in 1844" as discussed by Cotterill (1987: 174). The principles provided the guiding framework for running cooperatives such as the requirements for a person to become a member and how leaders come into power in the cooperatives.

Further, the economic dynamics in which cooperatives operate pushed agricultural economists to adjust some principles to conform with the current economic situations, for instance, the first principle was adjusted to allow some considerations. Now the first principle says that agricultural cooperatives apart from voluntary joining the cooperative, can have both open and closed membership, where cooperatives can reject membership applications and can only accept new applicants if they want to expand and collect more funds (Cotterill, 1987).

Additionally, Ling (2011) proposes that, typically, cooperatives require capital to function. Furthermore, the capital-intensive nature of contemporary operations and the sale of value-added goods raise financial concerns. Besides, contemporary technology is frequently incorporated in new plants and equipment that need a huge volume of input for realizing an increasing return to scale and a significant capital expenditure. The requirement for equity capital to conduct a cooperative's duties and the members' need for funding their farming operations and living costs are always at odds. Under this narrative of the agricultural cooperative theory, this research interrogated the role of the Mamba Ginger Rural Cooperative Society in addressing the economic needs and issues of ginger farming in Same District.

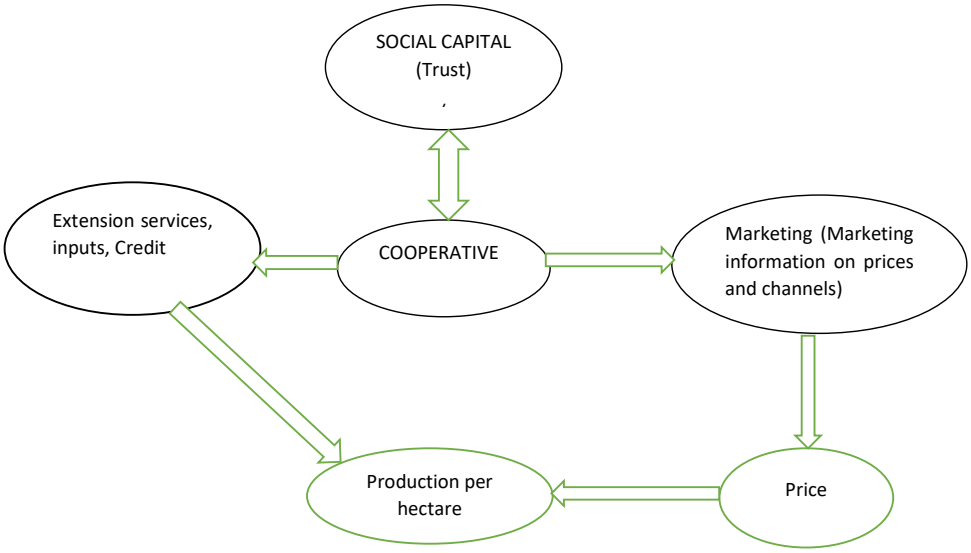
2.3.2 The role of Cooperatives in the Market

The narrative on cooperation for market efficiency in cooperatives is adapted from Nourse (1922) academic paper titled "Economic Philosophy of Co-operation". The major focus of Nourse's research centred on the function of crop cooperatives in the marketplace. In explaining the purposes of cooperation, Nourse provides several examples to show the ways

growers coordinate in associations to conduct different market activities mutually and effectively in different market circumstances. The examples provided by Nourse include cooperation for market access, local to regional coordination and region-wide associations. In showing the counterbalance power principle, the examples provided demonstrate how cooperatives are formed and grow in order for farmers to have bargaining power in the marketplace (Nourse, 1992). Regarding the pro-market characteristic of cooperatives, agricultural cooperation, according to Nourse, has a theoretical meaning of functional rearrangement instead of overall economic restoration. As a result, the cooperative's particular economic philosophy is regarded as a method of improving producer and consumer by enhancing the effectiveness of the economic system. Expounding the analogy of cooperatives as competitive yardsticks, Nourse contends that the cooperative is a way of encouraging and preserving competitiveness in the marketplace. The supply-demand price dynamic "provides a tremendous impetus to cooperatives to design more techniques that allow sustaining their profit margins (Ling, 2011).

In summary from the two theories above, informal social interaction between farmers builds trust as one of the components of social capital. Then trust influences farmers to voluntarily form cooperatives as the means of addressing their production challenges to increase yields. Agricultural cooperatives can affect crop production by facilitating the availability of inputs, credits, extension services and marketing of agricultural produce from smallholder farmers as shown in figure 1. In this case, a cooperative membership influences access to extension services and inputs which improves production per hectare. Higher farm output can be attained not just by increasing the quantities of input use, but also by adopting the proper combination of various inputs and efficient use of them (González-Flores et al., 2014). Farmers are trained by the cooperatives the efficient use of inputs which lead to increased output. In another way, cooperatives influence the price that farmers receive for their produce which ultimately improves production. Farmers are rational, they tend to increase their production when the price is high and cooperatives play a role in giving marketing information on prices and buyers to their members (Hao et al., 2018).

Figure 1: The connection between social capital and agricultural cooperatives to farm production



Source: Adapted from Ma et al. (2018)

2.4 Literature review

This part of the researchers visited the existing studies on cooperatives, ginger production, and factor of production to get insights on the research conducted previously. Researcher has carried out literature review to identify existing literature and gaps associated. It does so by first starting with cooperatives in Tanzania then proceeds to other important parts within this literature. So, this part discussed the findings from different studies conducted in various countries and contexts.

2.4.1 Cooperatives in Tanzania

The history of cooperatives in Tanzania began during a pre-colonial period and focused on commercial crops such as coffee, cotton, and sisal to mention a few (Coulson, 2013). The country continued to enjoy the fast growth of cooperatives even after attaining its independence in 1961. The records show that Tanzania was among the top African countries which had the biggest agricultural movement and third in the world based on the percentage of the market share of agricultural exports in 1968 (Maghimbi, 2010). However, cooperatives started to perform poorly after the government of Tanzania adopted a socialism policy in the economy in 1974 and ceased all primary cooperatives since they did not fulfil the socialism policy criteria (Maghimbi, 1992). Aftermath, the government started experiencing a

decline in foreign currency earrings due to the fall of farmers' production attributed to the poor supply of inputs.

In addition, cooperative movement in Tanzania exhibits a four-level structure. The lowest level of the cooperative is the primary which is at the grassroots and formed by the farmers to safeguard their interests. Then, secondary level followed by tertiary and finally, fourth level is cooperative federation which encompasses primary, secondary, and tertiary societies (Pollet, 2009:08). However, Cooperative Societies Act 2003 specifies only primary cooperatives and federations in the structure of cooperative movement in Tanzania. Although the Act recognizes secondary and tertiary levels and provided room for the primary cooperatives if they want to form secondary, and unions have the decision to form tertiary level (apex) regarding their needs and goals (Sumelius et al., 2014).

2.4.2 Issues in Cooperatives

Cooperatives have been key drivers in stimulating production, poverty reduction and echoing out smallholder enterprises' challenges. However, it has been facing different bottlenecks that impede its smooth functioning. Mruma (2014:78) assessed the 50 years of cooperatives existence in Tanzania and came up with numerous problems faced by cooperatives such as weak administration, fraud, misappropriation, insufficient investment, weak support institutions, unsuitable policies, low education of the members and strong challenges as the results of the free-market economy of the 1990s.

2.4.3 Cooperatives and Agriculture Production

In Tanzania, agricultural cooperatives have been contributing to the production of crops such as ginger. They play a central role from production to the marketing of the agricultural produce, that is, membership of cooperatives has been reported to influence the production of ginger. According to the cooperative theory, cooperatives influence the production of agricultural produce, and this can be the case of cooperatives in Tanzania. For instance, period of 2005, ginger production in Tanzania was 6000 metric tonnes (ITC, 2014), that was before cooperatives. Now with the help from cooperatives, the number has risen, Same district itself in the production year 2019 produced 19,800 metric tons of ginger (Same DAICO, 2020). Although cooperatives can have an influence, there are also other factors that determine the production of ginger in Tanzania. As per Mmasa and Mhagama (2017) study, some of these factors include the level of education, inputs used and working with extension agents.

Furthermore, Severine (2016) notes that farmers' cooperatives can enhance marketing and ginger values chains that will motivate farmers to produce more. This can also be relevant in the case of Same district where the production and value ginger value chain has increased. This shows how farmer's cooperatives are important for smallholder farmers like those in Same district. This study discusses agricultural cooperatives and their impact on production resulting from access to high-quality inputs, marketing, access to credit, and extension services. These elements are important for this study because they attract smallholder farmers to form cooperatives for their benefit (Nugusse et al (2013).

2.4.4 Agricultural cooperatives and inputs

Inputs are the most important factors that affect crop outputs. In this sense, access to inputs such as ginger sets(cultivars), fertilizers and chemicals determine the output per unit area. Existing studies have highlighted the significance of inputs in the improvement of crop production. A study by Eticha (2020) on the factors that determine ginger production in Ethiopia found that there is a significant contribution of inputs on ginger output. He highlighted that apart from other factors like land size, farmers' experience, and education, use of fertilizer and herbicides improved ginger output. This can also be relevant in Same district in Tanzania where farmer's cooperatives remove barriers when accessing inputs for ginger production. In line with this, he highlighted the importance of organizations such as cooperatives in smoothing access to inputs for ginger production which would then stimulate outputs. In this case, cooperative membership can provide different entitlements to members. As Chidiebere-Mark (2018) study on Nigeria shows, members of cooperatives usually have some advantages over non-members. For instance, cooperatives membership can also result increased access to inputs of production. According to Ayodele and Sambo (2014), 100 per cent additional inputs increase ginger yields up to 350 per cent. In their study, they found that inputs such as ginger sets(cultivars) and fertilizers have a positive and significant effect on ginger production.

2.4.5 Agricultural cooperatives and members access to credits

Another prominent problem that many smallholder ginger farmers have been experiencing in production is the difficulty of accessing loans that can be used to increase capital for production (Makarau et al., 2013). Financial institutions require farmers to meet conditions such as submitting collateral before being given the loans. Due to the lack of collateral and inability to meet other requirements, then cooperatives seem to be the alternative way of obtaining credits among smallholder farmers to scale up their production and realize a high profit. In the study on youth involvement in agriculture, ElDidi et al. (2020) point out how youths

were constrained with the accessibility of the loans to venture into ginger production and its negative consequences in addressing unemployment in Nigeria. In their findings, respondents gave testimonies on how membership in the cooperative helped them to access credit meanwhile explaining that seeking credits out of the cooperative was challenging, hence, this motivated many youths to join the cooperative to get access to credits.

Similarly, women in Tanzania used their cooperatives to access loans and injected them into coffee production (Maleko and Msuya, 2015). Their findings suggested that accessibility of the credits influenced coffee production of those women who were members of the cooperative by financing the purchase of fertilizers, seedlings, and herbicides. In Mali, members of the cooperatives received input credits and used them in their crop production through cooperatives with an agreement to be deducted from their sales in the cooperatives (Sidibé et al., 2018). Their yields increased and managed to repay credits and ultimately food security was improved among the households of the members of the cooperatives. Since farmers are rational; therefore, they would like to join the cooperatives to tap this opportunity of accessing credits to improve their production and increase their profit margin. Regarding smallholder ginger farmers in Same district, they decided to join into Mamba Ginger Rural Cooperative Society to widen their chances of getting loans that are injected into the ginger production and increase their output and profit.

2.4.6 Agricultural Cooperatives and Marketing

Availability and access to the ginger market through numerous buyers for smallholder ginger farmers is important for better performance of ginger production which could lead to an increase in ginger output. Farmers need to know where and to whom they will sell their agricultural produce, and this influence their production decisions for the next planting seasons. In Ethiopia, cooperatives played role in widening marketing opportunities of ginger to their members (Asale and Ashango, 2017). Following the available markets and high prices of ginger that were facilitated by the cooperatives, members were motivated to protect those advantages by strengthening their cooperatives as evidenced by 48.3 % of the interviewed farmers and this has driven them to expand irrigation activities to increase ginger production as seen by 41.7% of members already commenced.

However, farmers who are not members of cooperatives have limited access to good markets and are at risk to traders and middlemen exploitative prices (Francesconi and Heerink, 2011). Middlemen offered to them fluctuating prices that were below the prices paid to farmers by their cooperatives. In fact, farmers organized into cooperatives tap the profit that would have gone to middlemen. Francesconi and Heerink (2011) suggested that establishing cooperatives can widen the chances of the farmers to expand production and access to the

market of their produce because farmers are rational and when prices are high, they produce more. In this case, farmers acknowledge the need of becoming members of the cooperatives as also pointed out by Nugusse (2013) in his study of the reasons driving farmers to join cooperatives in Ethiopia. She found strong influence of access to markets and high prices as major motivators to farmers in joining into the cooperatives despite the presence of other factors such as attending public meetings, access to information and access to training.

2.4.7 Agricultural cooperatives and Extension services

As among its objectives, cooperatives play an important role in ensuring the availability of extension services to members to improve agricultural productivity. Looking at the study on cooperatives in Rwanda, cooperatives played a central role in disseminating knowledge and innovation among farmers who were members of the cooperative by using training and extension services (Verhofstadt and Maertens, 2014). In turn, farmers were motivated to quickly accept new technology and good management practices that eventually improve agricultural production, productivity, and livelihoods. Looking from a ginger production perspective in Same district, the cooperative provided extension services and training to ginger farmers (members) which simultaneously increases technical efficiency and reduces the production costs due to better utilization of available inputs among members. Efficiently using inputs increases the technical efficiency of agricultural production and ultimately directly contributes to an increase in crop production.

Similarly, coffee farmers in Tanzania gained knowledge and skills provided by cooperatives through their extension officers which enabled them to control diseases and increase the quality of coffee berries (Bwabo et al., 2016). According to Abebaw and Haile (2013), ginger farmers who joined cooperatives received extension services as opposed to non-members because of the cooperative in Ethiopia. In the context of Nigeria, access to extension service increases the adoption of improved agricultural technologies by reducing supply-side limitations that result from market imperfection (Wossen et al., 2017). The extension services increase the chance for farmers to improve their production practices and use the best practices to improve productivity and increased.

Chapter 3
Research Methodology

This part introduces the procedures and methods that were employed to collect and analyse data required to answer the research questions. It comprises the research design of the study, target population, sampling of respondents, sampling techniques, data collection, methods of data analysis, ethical consideration, and research activities plan.

3.1 Research Design

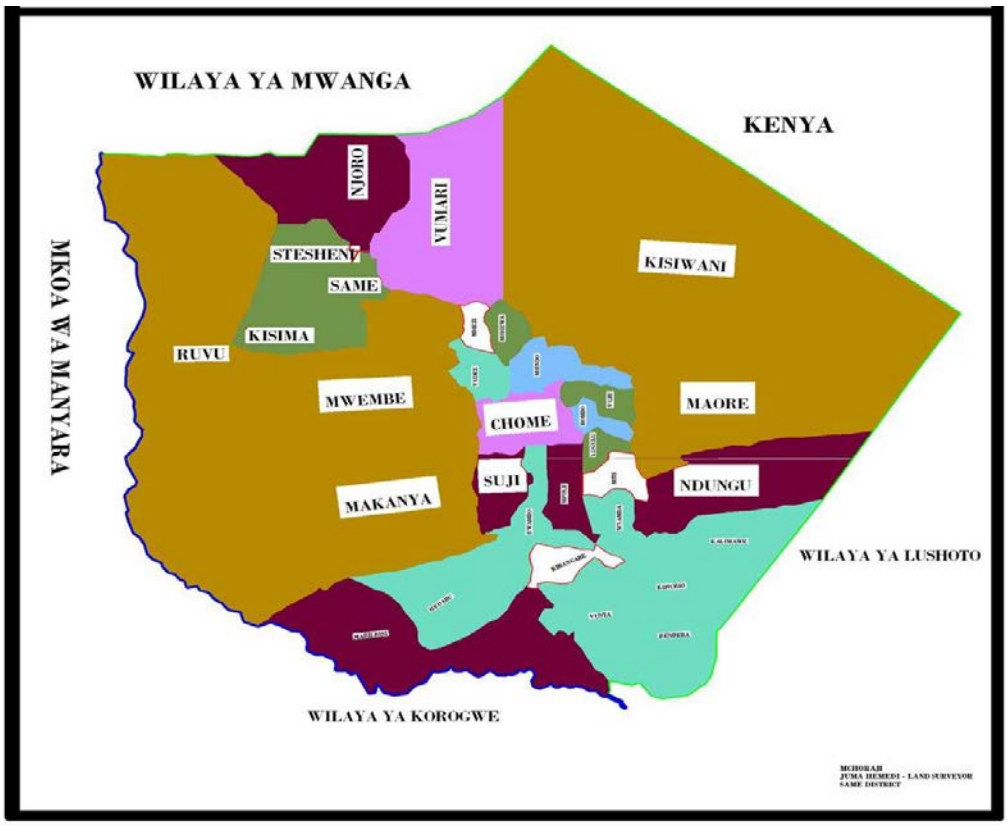
A research design is defined by Borg et al. (2003) as the processes chosen by the researcher to investigate questions or assumptions with the goal of gathering relevant data. Also, Kothari (2004: 31) defines research design as the "conceptual structure within which research is conducted; it comprises the outline for the collection, measurement, and analysis of data." The research design of this study is a cross-section that employed structured questionnaires collect data from smallholder ginger growers and semi-structured interviews for government officials, both carried out in August 2021. The data collection was guided by research questions, objectives, and the research problem. Accordingly, both qualitative and quantitative methods were employed. Tools such as semi structured interviews of qualitative methods were used while quantitative tools such as structured questionnaire is used. Researcher has used these different tools to answer research question. The choice of these methods and tools were seen to be most appropriate tools to realise objectives of this study.

3.2 Description of Study Area

Same district is among seven districts that make up the Kilimanjaro region in Tanzania and is located in the northern part of the country. The district borders with Mwanga district to the north, Kenya to the northeast, Tanga Region to the south and southeast, and Manyara region to the west. According to the fifth Tanzania Population and Housing Census of 2012 (NBS, 2013), Same district is estimated to have a total population of 269,807 people. The economy of Same district depends on agriculture, livestock keeping and service trading. Same District Profile (2016) shows that about 80% of the population depend entirely on agriculture and livestock sectors for their living. Most of the rural populations are small scale farmers and agro-pastoralists. Small-scale farmers produce both food and cash crops and the average land size under cultivation per farmer ranges between 1 and 5 hectares. The semi-

traditional farming system is characterized by low use of farm inputs therefore the agricultural production is technically below the average obtainable levels (Same District Profile, 2016).

Map 1: Map of Same District



Source: Same District Profile (2016)

3.3 Target Population

The target population was all the 5667 households that are engaged in the production of ginger in Same district. These farmers operationalize their agricultural activities in three wards namely Myamba ward with 2487 households, Mpinji ward with 1394 households, and Bwambo ward with 1786 households (Same DAICO, 2020). Cluster sampling was employed to obtain the sample from members and non-members of cooperative from each ward.

3.4 Sampling Procedures

In this section, the study discusses the sampling techniques that were employed to get the sample from the target population. Also, this section discusses sample size determination and how it was derived.

3.4.1 Sampling Techniques

The research used purposive and stratified sampling to obtain the required information necessary to answer the research questions. The reason for choosing stratified sampling was because the intended sample contained heterogenous groups. The sample comprised members and non-members of cooperatives. The purposive sampling was used to collect information from District Agriculture, Irrigation and Cooperative Officer (DAICO), District Cooperative Officer (DCO), Agricultural Extension Officer (AEO), and a member of the management of the cooperatives. The sample unit is the household, and the sampling frame consisted of a list of the households that are cultivating ginger within three wards namely Myamba, Mpinji and Bwambo.

3.4.2 Sample Size

During sampling, the researcher conducted stratified random sampling techniques to draw the representative sample from the population that was studied. From the list of smallholder ginger farmers in Same district, the study gave equal weight on the sample size of smallholder ginger growers representing members and non-members of the cooperative. Then, 50 cooperative members and 50 non-members of the cooperative were randomly selected, and purposely selected three key officials from the department of agriculture in Same district and one leader from the cooperative leadership who provided additional information on cooperative and ginger production.

Therefore, the total sample for this study was 100 respondents. Additionally, a semi-structured interview was held with government officials and a member of the cooperative management which in the end gave a total of 104 respondents.

A formula for calculating sample size using a Confidence interval of 95% ($Z_{\alpha/2}$ = 1.96), Margin error of 10%, Population proportion of 80% (p=0.8) which gave us 61[1] respondents. But for good results, the sample size should be as large as possible that's why I decided to add 39 more participants from smallholder farmers which gave a total of 100. The distribution of the sample size across each ward was Myamba with 45 participants (23 members and 22 non-members of cooperative), Mpinji with 25 participants (12 members and 13 non-members), and Bwambo ward with 30 participants (15 members and 15 non-members). The sample size in each ward is shown in Appendix 5.

[1] $N = \frac{(Z_{\alpha/2})^2 * p * (1-p)}{(MOE)^2}$ $Z_{\alpha/2}$ = 1.96, p = 0.8, (1-p) = 1-0.8= 0.2, MOE = 10%= 0.1; N= $\frac{1.96^2 \times 0.8 \times 0.2}{0.1^2}$ = 61

3.5 Data Collection

In this study, primary data were collected in the field for two weeks by using structured questionnaires encompassing questions that were voluntary responded by participants, and a semi-structured interview. Quantitative data were gathered by using questionnaires while qualitative data were collected by using semi-structured interviews. Information gathered using structured questionnaires include factors that influence smallholder ginger farmers to join or not join the cooperative, ginger production per farmer, and the benefits that members of a cooperative receive.

On the other hand, a semi-structured interview was used to explore the challenges Mamba Ginger Growers Rural Cooperative Society faces and the existence of coping mechanisms. Since the majority of the respondents were not capable to speak or read the text in English language, the questionnaires were translated to Kiswahili language which is the common language for communication in the study area. The study adopted face to face survey approach because it helped to build trust between a researcher and farmers and gave the room to clarify to questions in situations where respondents did not fully comprehend along with observing non-verbal signs. This helped the researcher to receive good responses from the farmers.

Moreover, in some instances, this offered the researcher to provide a chance for the respondents to further discuss their answers to close-ended questions. This enabled the researcher to get more information that would not have been obtained from the selected option of answers. In addition, the researcher repeated asking the questions when the respondents were seen to have doubts with their choices of the answers.

In collecting qualitative data, the researcher conducted semi-structured interviews with the chairperson of the cooperative and government officials who oversee cooperatives administrations and agriculture production in the district. During the process of data collection, I used an agricultural field officer who is working with ginger growers in the study area as my research assistant to facilitate communication with farmers.

3.6 Methods of Data Analysis

The study used descriptive and regression analysis to analyse the empirical data collected from the smallholder farmers. This means that characteristics of the respondents was explained by using descriptive statistics such as mean, standard deviation, range, frequency, and percentages. In this study, collected data were entered, coded, and cleaned by using excel,

and regression analysis with STATA was employed to carry out important empirical estimates.

3.6.1 Unit of Analysis

This study used a household engaged in ginger farming as the unit of analysis. The production land is owned by the household and activities are done by household members and the output is shared by the members. Therefore, the head of the household represents the household in responding to the questions in the questionnaires.

3.6.2 Model Specification

In this study, the dependent variable is a production of ginger output (Y) in kilogram per hectare produced in the study area per production season. The explanatory variables are cooperative membership (CM), and $\boldsymbol{X_i}$ represent all observable variables such as inputs(I), credit(C), extension services (ES), marketing(M), Land size(L), Education of the farmer(E), Age(A), Family size(F), Farming experience (FE) while unexplained part will be represented by the error term(μ). Farmer characteristics comprised sex, age, and education while the variable input in this study means g ginger cultivars (seed) and fertilizer. Below is the model specified to examining whether being a member or non-member of the cooperative has an influence in ginger production per hectare among smallholder farmers in Same district.

Model $$\boldsymbol{Y_i = \beta_0 + \beta_1 CM_i + \beta_2 X_i + \varepsilon_i}$$

The index $\boldsymbol{i}$ represents the household engaged in ginger production and coefficients $\boldsymbol{\beta_1, \beta_2,}$ represent the magnitude of effects of each explanatory variable on the ginger production per hectare except, $\boldsymbol{\beta_0}$ which is a constant and $\boldsymbol{\varepsilon}$ which is the error term.

3.7 Ethical Consideration

Owing to the COVID-19 pandemic, this study paid attention to the research principle of "do no harm". So, all the time the researcher strictly applied and observed all COVID-19 measures to safeguard the safety of people who participated in the research process. As I needed to have face-to-face meetings with the participants during data collection, I strictly followed COVID-19 prevention rules and directives provided by the government of Tanzania. These are wearing masks in any gathering, washing hands using soap and clean water, a social distancing of about 1.5 meters, regular hand sanitization, preventing physical touch, avoiding unnecessary gathering, and staying at home when having signs of COVID-19. Before starting to interview the respondents, I provided a mask for each respondent and

ensured the masks were worn properly. And after completing the interview, the respondents were reminded to sanitize their hands before leaving. Furthermore, the researcher adhered to the research ethics of informing the purpose of the research, voluntary participation, confidentiality, anonymity by not disclosing their identities, and the usage of data strictly for research purposes. Before starting interviews, the researcher asked the participants their willingness to be interviewed as the ethical principle of voluntary participation applies and get their informed consent.

Chapter 4
Findings and Discussion

This chapter presents a discussion of the findings of the research. It presents the picture of ginger production in Same district, factors determining membership (or not) to a cooperative, benefits accruing to member farmers and, the effect of cooperative membership in ginger production, and challenges constraining the smooth functioning of a cooperative.

4.1 Selection biasness test between Members and Non-members of the cooperative

Selection bias is a major issue in econometric effect/impact analysis. The control group being those individuals who did not join the cooperative and treated group being the ginger farmers who joined the cooperative need to have same observable characteristics from the onset so that the findings will not be biased. From the sample of 100 ginger farmers, which was made up of 50 farmers who joined the cooperative and 50 farmers who did not join was interviewed but was the two groups have the same traits before?

To answer this question, a t-test was conducted between the two groups, assuming variation between them are the same on observable characteristics like age, education levels, gender, marital status, land size and farming experience. As can be seen from the Table Provided under Appendix 2, the two groups are not statistically different from each other in terms of gender, farming experience, education level and reporting being single or separated in their marital. However, the mean age for those who join cooperatives is 51 years whereas the mean age for those who are non-members is 43 years. Their difference is statistically significant meaning that when people become, they prefer to join cooperatives than the younger ones. Furthermore, 88% of those farmers who did not join the cooperative are married while this was 70% for the members.

4.2 Ginger Production in Same District

Ginger production in Same district is conducted mostly by smallholder growers. The results provided in Appendix 1 show that 75% of the farmers were male and 25% were female. From half of the sample that reported membership to cooperatives, 36% of the members (50%) are males and 14% are females. This implies that males dominated the cultivation of

cash crops, and they are likely to join the cooperative (see Table in Appendix 1). It seems that in our study area; women are not given equal opportunity with men on economic activities that have more returns. In addition, most of the farmers have primary education (84%), implying that probably as people get higher education, they are likely to search for other jobs than engaging in agriculture. Results from the Table provided under Appendix 3 show the average age of farmers was 47 years, meaning that youths are less likely to engage in ginger production. Also, the average land size cultivated for ginger was 2.085 hectares indicating that ginger production in the study area is dominated by small scale farmers.

4.3 Farmers participation in cooperatives

There are numerous factors that influence the likelihood of the farmers to join cooperatives. Among others, education, size of cultivated land, years a farmer spent on farming, age, marital status to mention a few, were highlighted in different studies (Francesconi and Heerink, 2011; Chagwiza et al., 2016; Mojo et al., 2017). These factors were presented as seen and discussed in Table 1 below

Table 1: Determinants of Cooperative membership/participation: Marginal effects after Probit.

VARIABLES	CM (Mfx)
Age	0.0200***
	(0.00615)
Household size	0.0243
	(0.0308)
Primary education	-0.335
	(0.290)
Secondary education	-0.285
	(0.303)
Male	0.163
	(0.159)
Own land only	0.865***
	(0.0414)
Own and rent	0.888***
	(0.0252)
Farming experience	-0.0187
	(0.0124)
Married	-0.292
	(0.282)
Divorced/Separated	0.166
	(0.340)
Widow	0.280
	(0.364)
Size of cultivated land	-0.0316
	(0.0511)
Observations	100

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The observable characteristics influencing farmers to join cooperatives were analysed and the estimates provided in Table 1 above showing that age of the farmer has a positive relationship to participation in the cooperative and is statistically significant at 1% with a

magnitude of 0.02. This implies that as age increases by 1 year, farmers are 2 percentage points more likely to join the cooperative. Education level also plays a role in influencing farmers participation in a cooperative. It seems that as people become more educated, they tend to get more skilled and knowledgeable by being able to search and access information (e.g., information on marketing channels and potential buyers, modern technology, credit lending institutions, and research). As such they tend to implement these skills in farming ginger and do not join cooperatives as seen in Table 1. Although this is not statistically significant, still, it is justifiable as more educated farmers tend to use social media and the internet where they will get to learn and get market which the cooperative society offers than those people who did get limited education. Land ownership also had a positive and statistically significant effect on cooperative participation. From table 1, we see that people who farm ginger on their own lands had a higher probability to join cooperative by 86.5 percentage points higher than those individuals who rent land to plant ginger. Similarly, those who both rent and farm their own land have higher chance to join cooperative than those who rent by 88.8 percentage point, this value being statistically significant at 1%.

Land ownership and age are the main observable characteristics that have positive and significant factors that determine farmers participation into the cooperative. Other factors like education level, farm experience and land size have negative but insignificant effects on joining the cooperative. Male farmers, however, have a higher probability of joining the cooperative compared to females with a 16.3 percentage points significant difference. Furthermore, being a widow and separated status have statistically insignificant influence on farmers to join the cooperative compared to single status farmers with a magnitude of 28 and 16.3 percentage points respectively.

4.4 Cooperative and Ginger Production

Table 2 presents the estimates from an Ordinary Least Square (OLS) regression examining the effect of being a member of cooperative and other exogenous variables on output per hectare in kilograms of ginger produced. As can be seen from Table 2, cooperative membership has a positive relationship with ginger production and is statistically significant at a 1% significance level. This indicates members of a cooperative have by 84%[2] increase in their ginger production than non-members. This may well be related to the possibility for members to receive services from the cooperative that may have a direct or indirect bearing on their production. For example, the findings of this study on the market category show that

[2] The value is derived from interpreting the semi-log function: *((e^(0.610)-1)*100).*

members reported to have a stable market with higher prices than non-members. This increased their profit margins and might have motivated them to produce more. Another factor that has led to the positive effect of being a member of a cooperative society to increase production is the availability of extension services to offer best farming practices in the study area. Through extension services, members of the cooperative received training on best ginger agronomic practices such as proper use of fertilizer and ginger management, and this support the findings of the other studies in Cambodia and Zambia (Ofori et al., 2019; Manda et al., 2020) that argue crop yield increased due to cooperative membership. In their studies, cooperatives delivered extension services such as training to their members, and this in turn increased technical efficiency and production. The insignificant effect of the credits to the production in our case was attributed to the inability of the cooperative to provide credits to its members due to limited funds. Thus, if credit was being awarded to ginger farmers through the cooperative, we could have expected a higher production than the 84% value above since farmers now can manage to purchase improved variety of ginger cultivars and farming equipment for production.

In addition, the results show a positive relationship between farm experience and quantity of ginger produced per hectare and is statistically significant at the 5% level of significance. As such an increase of one year of experience in ginger farming increases ginger output per hectare by 0.89% [3] after holding other factors constant. Experience enables one to learn best farming practices and the knowledge of doing the same thing over time will lead to increase efficiency and high yields and the results are congruent with this assumption.

Ginger farmers in Same district were mostly small-scale farmers with limited resources. Marriage calls for additional resources to run the family affairs as well as continue farming ginger and with the additional cost of managing the family, it leads to cost cutting inputs in farming. From the results in Table 2, being married has a negative effect on ginger production per unit hectare with the effect being statistically significant at the 10% level. This means that holding other variables constant, married ginger farmers will reduce their production per unit hectare by 18% compared to farmers who are not married.

Most farmers who joined cooperative were old people as shown in Table provided under Appendix 2. Despite growth in farming experience, there is a limit in growth in production as ginger farming is labour-intensive crop. This means that there is a limit age that farming experience tends to drop with increase in age and hence as can be seen from Table 2, production of ginger farming per unit hectare is negative though not statistically significant.

[3] The value is derived from interpreting the semi-log function: ((e^(0.00886)-1)*100).

Table 2: Effects of membership in a cooperative on ginger production

VARIABLES	Log output per hectare
Cooperative membership	0.610***
	(0.0491)
Age	-0.00208
	(0.00228)
Household size	-0.0110
	(0.0124)
Primary education	0.0307
	(0.0629)
Secondary education	0.0195
	(0.0811)
Male	-0.00189
	(0.0516)
Own land	0.141
	(0.160)
Both own and rent land	0.165
	(0.163)
Farming experience	0.00886**
	(0.00388)
Married	-0.199*
	(0.108)
Divorce/Separated	-0.170
	(0.113)
Widow	-0.142
	(0.111)
Size of cultivated land	-0.0354
	(0.0250)
Constant	8.465***
	(0.210)
Observations	100
R-squared	0.699

Robust standard errors in parentheses

**** p<0.01, ** p<0.05, * p<0.1*

4.5 Farmers and Cooperative

This section of the study provided debate on the reasons that were likely to motivate farmers to join the cooperative and what would likely happen when the expectations of the members would not be met and their implication to potential new members to the cooperative.

4.5.1 Why do Farmers join a cooperative?

Farmers voluntarily decide to organize themselves into groups and cooperatives as a means of overcoming problems hindering the enhancement of their production and market access. In terms of production, cooperatives are reported to facilitate access to credit, inputs, and extension services. Subsequently, cooperatives have stood out as the central link between farmers and buyers, and simultaneously creating employment and stabilizing markets for agricultural outputs for a long time (Asale and Ashango, 2017; Chidiebere-Mark, 2018; Ling, 2011).

Table 3: Reason for Membership Status

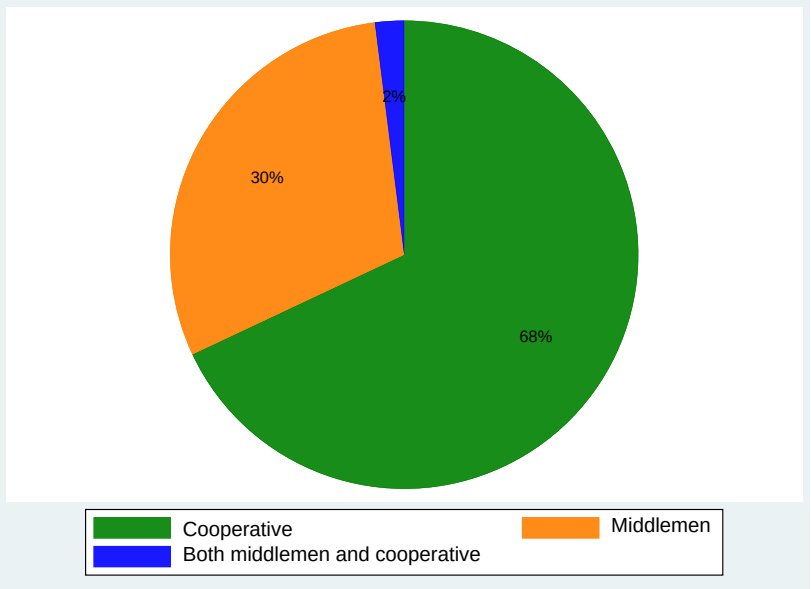
Reasons for being a member	
Access to extension services	4%
Access to markets	78%
Access to credits	18%
Reasons for not being a member	
No trust	74%
Corruption	2%
Zero benefits	6%
Lack of awareness	18%

Source: Author's own survey, August 2021

As can be seen from Table 3 above, 78% of the interviewed farmers who are members of the cooperative reported that their desire to get access to markets and a good price for their ginger by increasing their bargaining power was the prominent reason that influenced their decision to join the cooperative. When asked about buyers for their ginger, the interviewed farmers reported that after harvest, 68% of the members sold their ginger through cooperative while 30% of the interviewed members sold their ginger to middlemen and 2% of the members sold to both middlemen and the cooperative as shown in Figure 2 below. Members of the cooperative were expected to sell their ginger to the cooperative but in this case, we see that 30% of the farmers, although being members of the cooperative,

sold their ginger to middlemen. What motivates them to sell to middlemen and not a cooperative? Is it an attractive price or flexibility in payment methods?

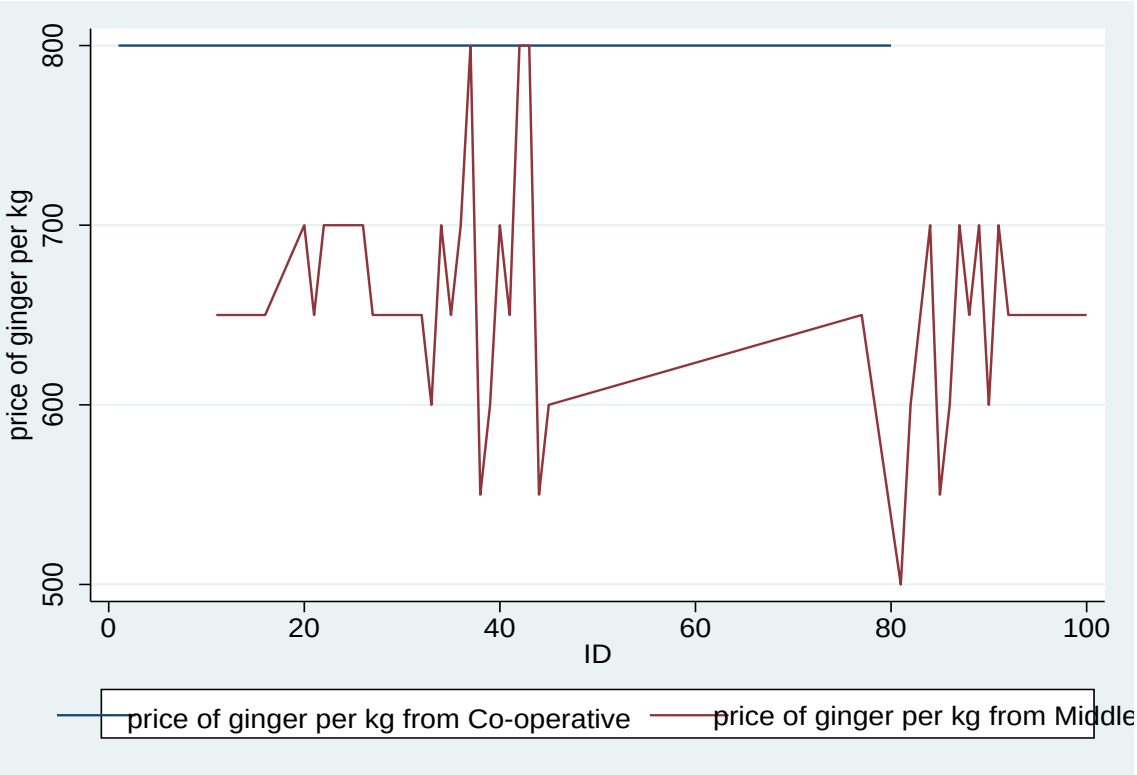
Figure 2: Distribution of Ginger buyers by categories



Source: Author's own survey, August 2021

In addition, despite the fall in economic growth and the decline in the price of ginger in the markets due to COVID-19, members of the cooperative still received higher prices (TZS 800 per kg) from the cooperative than non-members who relied on the prices offered by the middlemen. Also, this was supported by a chairperson of the cooperative during a discussion with him. According to the chairperson of the cooperative *"…our members sold their ginger at higher price than the prices offered by the middlemen."* The middlemen offered a fluctuating price ranging from TZS 500 to TZS 700 per kilogram as evidenced by the high response of the farmers (figure 3). The difference of prices has implication in the decision of the farmers to join cooperative and affect production of ginger between members and non-members of the cooperative.

Figure 3: Prices of ginger between Cooperative and Middlemen



Source: Author's own survey, August 2021

Respondents that are not members of the cooperative reported that market access and price fluctuation were among the challenges in their production. As it was difficult to access good markets and prices of their ginger individually, farmers had to become members of the cooperative. This finding is in line with the results of a study conducted in Ethiopia by Nugusse (2010) on why farmers in rural areas decide join to or not to join cooperatives. His study revealed that farmers join cooperatives mainly to gain market access and good prices for their output, even though other reasons such as access to information, education and attending public meetings were also reported to influence farmers decisions to become members.

Further, the study revealed that farmers reported joining the cooperative with the expectation of getting credits to financing their production activities. During our interviews, respondents reported that they have been experiencing inadequate capital to buy fertilizers, ginger sets (cultivars) and outsource labour-power outside their family. Because of the promise from the cooperative to give credits to the members at a low interest rate and without requesting collaterals, as is the case with other financial institutions, farmers were motivated to join the cooperative to tap this advantage to solve the problem of capital shortage. As can be seen from Table 3 above, 18% of the interviewed members of the cooperative reported that they joined the cooperative to get credits to cover their capital shortage

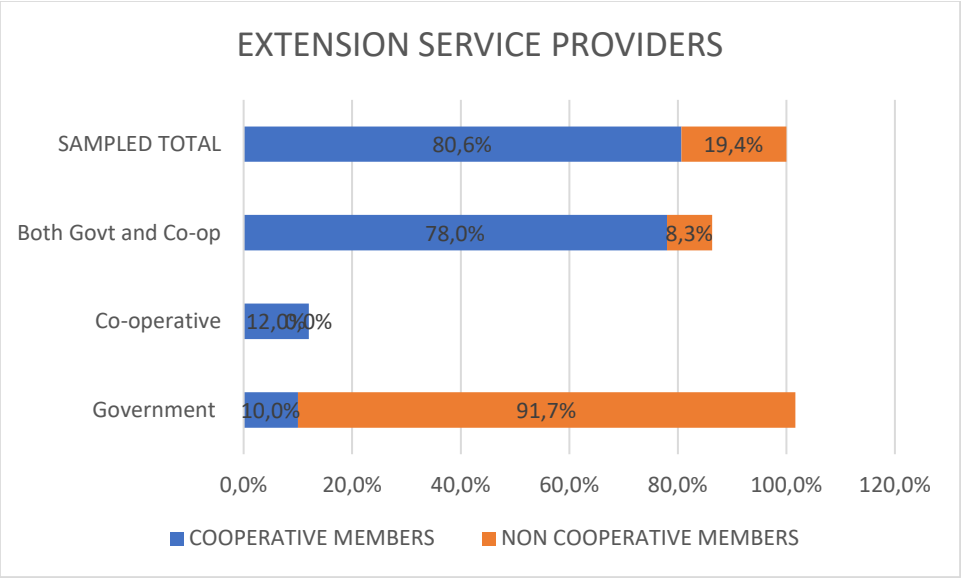
experienced due to the increasing costs of production. This motive of joining the cooperative was also reported by the chairperson of the cooperative. The same reasons for farmers to join the cooperative was found in the studies conducted by LeVay (1983) and Nourse (1992) on the reasons motivating farmers to voluntarily join the cooperatives and other groups. Both studies pointed out that the desire of farmers to access credits to fund their production operations and family needs has become among the core reasons motivating farmers to join cooperatives. They further explained how these credits have effects on agricultural production, especially when used to expand production by purchasing improved inputs such as ginger sets (cultivars) and fertilizers.

However, this study showed that all the interviewed farmers (members and non-members) reported accessing loans from sources other than cooperatives indicating that the cooperative was not providing credits to the members (see Appendix 1). This contrast with findings from other studies that showed members accessing credit facilities in the form of either inputs or money from their cooperatives. These findings were further supported by our discussion with the chairperson of the Mamba Ginger Grower Rural Cooperative. He commented that although providing credits to members lies as one of the objectives of the cooperative, this was not possible due to inadequate funds in the cooperative. The gap offered middlemen to come up with an advance payment to farmers before the harvests which in turn tied farmers to sell ginger to the middlemen instead of to their cooperative. This explains as why 30% of the members (as shown in Figure 2 above) still selling their ginger to the middlemen despite the cooperative offering high and stable prices to their members. The finding in line with the case reported in Ethiopia, where 42% of coffee farmers who were members of the cooperatives reported to sell their berries to other buyers than selling to their cooperatives (Anteneh et al., 2011); inability of the cooperatives to provide credits to members being one of the reasons. The sustainable growth of a cooperative depends on the satisfaction of its members from meeting their objectives. Lack of credit facilities in Mamba Ginger Growers Rural Cooperative Society might be the reason hindering the substantial growth of the cooperative in terms of its membership base although the cooperative was formed in 2008.

Moreover, few respondents reported that access to extension services was the motivation to join a cooperative. As shown in Table 3, only 4% of the members of the cooperative reported joining the cooperative to get access to extension services. This indicates that extension service was not among the major challenges to farmers, probably because it was accessible through government agricultural extension officers working in the study area. This

can be seen from our sample which shows that 78% of members of the cooperative received extensions services from both the government and cooperative.

Figure 4: Extension service providers to Members and Non-members of the cooperative



Source: Author's own survey, August 2021

Since the government was providing extension services even before the formation of this cooperative, then we could conclude that Mamba Ginger Growers Rural Cooperative Society collaborated with the government in the provision of extension services to ginger farmers. 78% of the members from the figure 4 above got extension services from both parties (government and the cooperative) and only 12% of the cooperative members got extension services only from the cooperative. These findings of the study contrast with the findings from the study conducted by Abebaw and Haile (2013) on the interlinkages between cooperative membership and extension services. Their findings showed that farmers are motivated to join cooperatives to get extension services easily than seeking individually.

In summary, the main reasons brought forward in this study motivating farmers to join the cooperative include access to credit facilities, extension services, and markets and better prices through increasing their bargaining power in marketing their ginger output. Similar findings have been presented from other studies conducted on cooperatives dealing with different crops and in other study areas (Ito et al., 2012; Wollni and Zeller, 2007)

4.5.2 Why do farmers hesitate to join a cooperative?

In the study area, the research revealed many farmers were still not members of the Mamba Ginger Growers Rural Cooperative Society. From the start of the cooperative, 350 members subscribed in the year 2008 and currently, the cooperative has 612 registered members out of the 5667 ginger farmers indicating that 5055 farmers are still non-members. Some of the

non-members were members of the cooperative before terminating their memberships to the cooperative. Different reasons were provided by non-members explaining why they hesitated to join the cooperative or dropped out (9 non-member farmers). First, farmers reported having low trust in the cooperative leadership. As can be seen from Table 3, 74% of the non-member interviewees responded that they mistrusted cooperative leadership because there were issues of transparency and accountability between members and the previous leadership team. Complaints from the members of the cooperative to the leaders on the loss of their ginger that occurred in 2013 and the insufficient amount of compensation given to them discouraged farmers from continuing their membership to the cooperative. During the time, farmers delivering their output to the cooperative were paid only one-third of the value of ginger. Because of this, those farmers who were members dropped out of the cooperative as they had no longer trusted the leadership of the cooperative. The drop out of the members also discouraged other farmers from joining the cooperative. The district cooperative officer supported the argument that lack of transparency in communicating information pertaining the losses incurred in 2013 coupled with lack of accountability by the cooperative leadership led to low trust from farmers to the cooperative on whether their expectations of joining the cooperative would be met.

Moreover, the study revealed that the cooperative was unable to provide some services such as credit and inputs that would otherwise attract new memberships. When the cooperative fails to meet the needs of the farmers, non-members are likely not to join the cooperative. As can be seen from Table 3, 6% of non-members reported that they did not see the benefits of becoming members of the cooperatives because the services they wanted were not provided to the members. Most of the farmers, both members and non-members of the cooperative, reported having insufficient capital at the same time the cooperative could not be able to provide credits to the members to address the shortage of capital (see Appendix 1). Also, the respondents reported using ginger sets (cultivars) from the previous harvest for planting and fertilizers that were purchased from small input suppliers indicating that despite being members, the cooperative could not provide agricultural inputs. Accordingly, some farmers reported that there were zero benefits of becoming members of the cooperative. Furthermore, some of the interviewed farmers reported that they did not join the cooperative because they had not enough information about the cooperative. As can be seen from Table 3, 18% of the non-members reported that they were not aware of how they would benefit from being members of the cooperative. For example, during the interview, one of the respondents explains that he had not become a member because he had no information about the cooperative since he moved to the ward from a neighbouring region he was living in before. This implies that awareness about the cooperatives has not reached

many ginger farmers and there is a need for the cooperative leadership to plan on awareness-raising programs to enhance awareness of farmers.

Findings from other studies suggested similar reasons as to why farmers seemed not to join cooperatives. For example, the study by Maghimbi (2010) on revival and growth of cooperatives in Tanzania identified loss of trust as among the reasons that still discourage farmers to join cooperatives following a big loss of farmers' output and dissatisfaction with the services like credit services, inputs, and poor performance of the cooperatives in the 1980s. Even after the decision of the government to resurge cooperatives in Tanzania, farmers worry whether their needs would be met.

Moreover, a cooperative helped to strengthen social cohesion among farmers who are members of the cooperative. Through attending cooperative meetings and participating in discussions related to their matters, members developed friendship and trust among themselves which in turn brought them together to address their challenges outside the cooperative. For instance, during social events like weddings and celebrations, members invited their fellow members to participate in these occasions. In addition, when members become sick, their fellow members visit and comfort, and even provide financial assistance when needed. From the discussions, the interviewed farmers who are members of the cooperative reported benefiting socially.

As can be seen from Table 4 below, 88% of interviewed members of the cooperative reported benefiting from social and financial support especially during hard times such as sickness and death. Also, it was observed for happy events like weddings and other celebrations where members collect contributions to support their fellow members. Additionally, 4% reported building trust among members which helped them in borrowing money and other agricultural equipment. So, trust strengthened friendship among them which smoothed the exchange of production experience and inputs such as ginger sets (cultivars) and fertilizers.

Table 4: Social benefits for members of the cooperative

social capital benefits	Percent
Trust	4.00
Social cohesion	4.00
Social and financial support	88.00
Zero benefits	4.00
Total	100.00

Source: Author's own survey, August 2021

4.7 Challenges of Mamba Ginger Growers Rural Cooperative Society

4.7.1 Capital

In agriculture production, capital is an important factor that enables the purchase of inputs such as ginger sets (cultivars), fertilizers, and chemicals that enhance production and improve farm revenues.

The research findings indicate that the Mamba ginger cooperative is constrained by capital hampering the proper implementation of its day-to-day activities. Due to inadequate capital, the cooperative was incapable to provide credits to members which in turn pushed them to seek credits from other formal and informal financial institutions. This was evident during our conversation with the chairperson of Mamba Ginger Rural Cooperative Society:

> "…our main problem has been capital to finance farmers ginger production activities…' [Interview August 30, 2021].

As a result of inadequate capital, the cooperative was further incapable to complete the installation of modern machines in the ginger processing factory which was built to add value to raw ginger and minimize post-harvest loss. As discussed by the District Cooperative Officer (DCO), Mamba Ginger Growers Rural Cooperative Society delays conducting training and dissemination of modern technology to its members due to limited funds to finance the program.

We observed deliberate efforts by the Mamba Ginger Growers Rural Cooperative Society to enhance capital availability in addressing the capital challenge. This is paramount because several studies in the literature underline the importance of capital in enhancing agricultural produce, ginger production in our case. Our discussion with the Cooperative Officer in Same district boldly confirms the usefulness of capital in cooperatives. Describing the collaborative efforts that are underway to enhance the capital portfolio of the cooperative, he discusses:

> "…the cooperative has a great need for capital to enhance production of the ginger in the district. However, currently our cooperative with the help of the government is in discussion with the Public Service Social Security Fund (PSSSF) which is ready to finance the installation of modern machines in the Ginger Processing Factory" [Interviewed August 31, 2021].

4.7.2 The middlemen in the market

Production of ginger in Same district involves different actors such as middlemen who play a role in marketing of farmers' produce. Abebe et al. (2016) explained middlemen as the actors in marketing who link farmers with buyers and final markets. Farmers sell their produce to either middlemen or use middlemen to find buyers.

The research findings show that some of the members of the cooperative still sell their ginger to the middlemen rather than to the cooperative despite the willingness of the cooperative to buy their ginger at the high price of TZS 800 per kilogram compared to the price ranging from TZS 500-700 per kilogram that middlemen offer. This is because the middlemen are willing to give loans to farmers as an incentive to consolidate and strengthen their relationship and commitment. As discussed earlier, most ginger producers have inadequate capital and collateral to enable them to access loans from financial institutions. This provided room for the middlemen to pay the farmers in advance especially when the farmers are in financial crisis. The middlemen used this opportunity to develop and strengthen their relationship with farmers which in turn, built trust and reciprocity between farmers and middlemen. This gives them an advantage of buying ginger from farmers and even if they are members of the cooperative.

The biggest concern in such interactions is to what extent the equality of benefits among middlemen and farmers is guaranteed. The study found that in some incidences these middlemen preclude farmers freedom to sell at the market price due to the loan they have collected from them. When interviewing one of the farmers, he complained about the issues related to lack of freedom as follows:

> "…in 2018 I harvested many bags of ginger, and the price was really good, unfortunately, I was forced to sell it to a broker at a low price due to a loan I took from him…" [Interviewed September 1, 2021]

As can be understood from the quote above, it can be argued that middlemen are in the position of power hence farmers seem to be vulnerable with no choice. While the use of middlemen has appeared to enhance financial capital assurance among farmers in Same district, it seems to perpetuate inequality in the whole production and distribution cycle within and among ginger market players at the same time. These findings are in line with the findings from a study by Ranjan (2017) on challenges horticultural farmers face in Senegal. During bargaining, middlemen dictated the price of produce and farmers received low prices.

4.7.3 Farmers responsiveness to cooperative

In a community, people voluntarily decide to collaborate with others in addressing their problems through the formation of groups such as cooperatives (Porter and Scully1987: 494). The degree of responsiveness of the farmers to join the cooperative depends on the trust and transparency between leadership and members. According to Hansen et al. (2002), members maintain membership in a cooperative when there is trust in the cooperative management board and transparency in the operations of the cooperative. Members need to know about contracts between their cooperative and other business stakeholders, auditing, and receive their money on time after selling their output to the cooperative. When the trust of the farmers in the cooperative becomes low, it contributes to members drop out and discourages other farmers from joining the cooperative. In this study, findings revealed that Mamba Ginger Growers Rural Cooperative Society has been experiencing membership dropout and a small number of new members joining since 2013. Initially, from its formation in 2008 until 2013, members enrolment to the cooperative was increasing. The dropout trend in recent years is explained by the lack of trust which the cooperative has been experiencing as evidenced by our conversation with the head of Agriculture and Cooperative from Same District Council.

> "… in 2014 farmers delivered raw ginger on credit to our cooperative… we received too many complaints that farmers were not paid their dues which amounted to TZS 220 million for all members." [Interviewed August 31, 2021].

Thus, the lack of transparency among cooperative leaders to the farmers about the compensation of the loss ended in farmers losing trust in the cooperative even though all the farmers who delivered their ginger were paid one-third of their debt. This fuelled mistrust of farmers to the cooperative and reduced the degree of farmers joining the cooperative. This is in line with a discussion of trust as one of the forms of social capital explained by Aldrich (2012) in a study on social capital theory. In the theory, Aldrich (2012) showed that the existence of trust in the community and groups strengthen the ties between people and attract other non-members to join the group.

Chapter 5
Conclusion and recommendation

The research has used social capital and agricultural cooperative theoretical frameworks to analyse and study cooperative memberships and ginger productivity. The first theoretical framework used in the research is social capital. This theoretical framework is used to understand and analyse the interlinkages of binding social capital (i.e. trust) and the formation of cooperatives and how also cooperatives can build the trust of members to the leadership to ensure their growth and long survival. The second theoretical framework used in this study is agricultural cooperative. This theoretical framework was used to understand and analyse how cooperative affects production. It is cooperative initiatives like those formed by Same district farmers in Tanzania that has provided support and security in their ginger farming and production.

This study contributes to the reformation of cooperative societies in Tanzania towards economic development and eradicating poverty amongst small-scale farmers. Several factors were discussed underlining the efficient functioning of cooperatives while meeting the stated objectives of their members. In investigating what motivate farmers to become members, access to the market and high prices for ginger was mentioned as the core reason and the findings showed those who have already become the members received high prices for their ginger. From the regression analysis, age was one of the factors that led farmers to join the cooperatives. Also, landowners were found to be highly motivated to join the cooperatives compared to those who rent land for farming. Looking on the production, from our findings, married farmers were found to negatively influence production of ginger, probably because marrying increases the family size and needs which sometimes pushes the household to reduce budget for ginger production. Farming experience was another factor that positively influenced ginger production in Same district. Farmers learn and accumulate skills and knowledge after repeating doing their activities over years. Using experience combined with their cooperative membership, farmers have a better chance to increase their ginger production.

The overall findings presented in this paper confirmed that cooperatives contribute to better performance of ginger production as it was shown that members of the cooperative were likely to report an increase in their ginger production per hectare. Thus, when farmers are organized into groups such as cooperatives, they are likely to improve and increase their output as opposed to farmers who are not in the cooperatives*, ceteris paribus*. Furthermore,

the findings support the theory of agricultural marketing cooperative explained in Nourse (1992) and LeVay (1983: 1-44) since Mamba Ginger Growers Rural Cooperative Society was found to provide markets and good prices to the members than the prices offered by other buyers which deemed to fluctuate. Apart from high prices and stable markets, the cooperative facilitates extensions services although these are also provided by the government.

However, the study found that members of the cooperative were not receiving credits and inputs despite mentioning these as among the reasons that motivated them to join a cooperative. Farmers were still using local ginger sets (cultivars) extracted from previous harvests which were likely to produce less ginger than using improved ginger sets (cultivars).

Mistrust to the cooperative was reported because of the experience of the loss that members got after delivering ginger coupled with Lack of transparency and accountability in handling members' complaints from the previous leadership. The study also revealed that farmers have limited awareness on a cooperative and the opportunities available to members. In addition, middlemen were found to be still powerful in dominating the market for ginger as they manage to buy ginger even from the members of the cooperative by taking advantage of financial challenges farmers face due to the inability to access loans from the cooperative.

Facilitating credits to farmers and supplying improved inputs will potentially increase ginger production enabling farmers to expand the area of production by managing additional costs of production. The increased production of ginger will lead to an increase in farm income and hence alleviating poverty in the rural parts of the country where agriculture remains their main economic activity. Capitalizing on the central role played by cooperatives in the marketing of agricultural output and access to factors of production, developing policies that strongly promote and support agricultural cooperatives such as ginger farmer cooperatives would be a possible avenue to address existing challenges of small-scale farming, that will, in turn, improve the income of the farmers and encourage rural development (*ceteris paribus*).

Following the findings of this research, it is worth making recommendation on the possible solutions based on the deficiencies identified by the study. The recommendations are divided in to three: to the cooperative management board, to the government, and to agricultural institutions to assist in improving ginger production. These recommendations are believed to address the challenges discussed in the study and, in turn, enhance ginger production, increase farm revenues, and achieve socio-economic development.

With regard to the cooperative leadership, the study recommends the leaders of the Mamba Ginger Rural Growers Cooperative to conduct sensitization campaigns for creating awareness to farmers on the benefits of membership and attract farmers to join the

cooperative. Transparency and accountability should be highly practised in the cooperative so that members develop trust in their leaders and maintain their membership. In addition, the cooperative should plan to provide credits to farmers to increase ginger output and overcome lobbying practices of middlemen to members of the cooperative who face financial difficulties. Leaders should collaborate with input suppliers to facilitate input credits (quality fertilizers, chemicals, and improved ginger sets) to the members and find loans from financial institutions to raise their capital for financing the cooperative operations.

Turning to lack of transparency and accountability; as the findings of this study showed that contributed to mistrust of farmers to the cooperative leadership; the government should enforce mechanisms to promote transparency and accountability among leaders in cooperatives and formulate laws and regulations on cooperative operations to safeguard the interests of cooperative members. Also, the government should provide financial assistance to the cooperative to complete the installation of modern machines in the ginger processing factory that was built to add value to raw ginger for increasing competency in the markets and reducing post-harvest loss by increasing shelf life of ginger.

The study revealed that farmers used local ginger sets (cultivars) extracted from the previous harvest for planting which in one way or another reduced quantity of ginger produced. In this sense, the study recommends research institutions dealing with agriculture to collaborate with the cooperative in supplying improved ginger variety to increase output per cultivated area. Subsequently, farmers will earn more revenue and ultimately enjoy more profit, *ceteris paribus*.

This study has also shown the significance and importance of studying topics around ginger production and farmers' cooperatives in developing countries especially the case of Tanzania. Further studies and academic research to bridge the research gap is necessary and highly recommended. Future research should focus on gender inequality in ginger production and assess the contribution of cooperatives in eliminating it. Also, another area for future research should be how global pandemics like COVID-19 can affect production of ginger and farmers' cooperatives in Tanzania.

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Notes

Appendix 1: Gender, Education, Sources of extension services, and Credit

	Cooperative members	Non-cooperative members	Total interviewed farmers
	GENDER		
Male	36.0%	39.0%	75.0%
Female	14.0%	11.0%	25.0%
Sampled Total	50.0%	50.0%	**100.0%**
	EDUCATION LEVEL		
No formal education	2.0%	1.0%	3.0%
Primary	42.0%	42.0%	84.0%
Secondary	6.0%	7.0%	13.0%
Sampled total	50.0%	50.0%	**100.0%**
	SOURCES OF EXTENSION SERVICES		
Government	8.1%	17.7%	25.8%
Co-operative	9.7%	0.0%	9.7%
Both Govt and Co-op	62.9%	1.6%	64.5%
Sampled total	80.6%	19.4%	**100.0%**
	SOURCE OF CREDITS		
Family/ Friends	21%	17%	38%
VICOBA/SACCOS	21%	33%	54%
Banks	8%	0%	8%
Cooperative	0%	0%	0%
Totals	50%	50%	**100%**

Source: Author's own survey, August 2021

Appendix 2: Average of age, size of cultivated land, household size, farming experience

Variable	Mean
Size of cultivated land	2.085
Age	46.73
Household size	5.44
Farming experience	11.69

Source: Author's own survey, August 2021

Appendix 3: Mean difference between the two groups on observable characteristics

Categorized by:	Mean distribution of: Non-members	Cooperative members	difference between means	St Err	t value	p value
Ginger output per hectare	4270.2	7681.6	-3411.4	243.323	-14	0
Age	42.56	50.9	-8.34	2.441	-3.4	0.001
Size of cultivated land	2.11	2.06	0.05	0.221	0.25	0.822
Farming experience	11.28	12.1	-0.82	1.25	-0.65	0.513
Male	0.78	0.72	0.06	0.088	0.7	0.493
Female	0.22	0.28	-0.06	0.088	-0.7	0.493
No education	0.02	0.04	-0.02	0.035	-0.6	0.563
Primary education	0.84	0.84	0	0.074	0	1
Secondary education	0.14	0.12	0.02	0.068	0.3	0.769
Married	0.88	0.7	0.18	0.081	2.25	0.027
Single	0.04	0.04	0	0.04	0	1
Separate/divorced	0.06	0.08	-0.02	0.052	-0.4	0.699
Widows	0.02	0.18	-0.16	0.059	-2.75	0.007

Source: Author's own survey, August 2021

Appendix 4: Definition of variables and measurement

Variable	Type	Definition and measurement
Dependent variable		
Production	Continuous	Natural logarithm of ginger output in kg per hectare
Independent variables		
Cooperative Membership (CM)	Dummy	=1 if member of a cooperative, =0 if non-member
Age	Continuous	Age of household head in years
Sex	Dummy	=1 if male household head, =0 if female household head
Marital status	Categorical	=1 if the household head is married, =2 if single, =3 if divorced/ separated, =4 if widow
Education	Categorical	=0 if the household head has no formal education, =1 if has primary education, =2 if has secondary education
Household size	Continuous	Number of household members living and eating meal together
Land size	Continuous	Size of cultivate land for ginger in hectare

Source: Author's own survey, August 2021

Appendix 5: Distribution of the sample from each ward

Calculation to obtain the members and non-members of the cooperative of each ward.

Members= $\frac{Members\ in\ the\ popukation}{Total\ \ number\ of\ farmers(population)} \times Total\ farmers\ in\ the\ ward$

Non-members= $\frac{Non-members\ in\ the\ popukation}{Total\ \ number\ of\ farmers(population)} \times Total\ farmers\ in\ the\ ward$

Mpinji ward (1394 farmers): Members $= \frac{612}{5667} \times 1394\ = 151$

Non-members= $\frac{5055}{5667} \times 1394 = 1243$

Myamba ward (2487 farmers): Members= $\frac{612}{5667} \times 2487\ = 274$

Non-members= $\frac{5055}{5667} \times 2487 = 2213$

Bwambo ward (1786 farmers): Members= $\frac{612}{5667} \times 1786\ = 193$

Non-members= $\frac{5055}{5667} \times 1786 = 1593$

Then from the proportion of smallholder ginger farmers from each ward and the sample size proportion for members (50 participants) and non-members (50 participants) required in the study, the following formula will be used to calculate the distribution for each ward.

Members= $\frac{Members\ in\ the\ ward}{Total\ \ members\ in\ the\ population} \times sample\ size\ of\ members$

Non-members= $\frac{Non-members\ in\ the\ ward}{Total\ \ non-members\ in\ the\ population} \times sample\ size\ of\ non-member$

Appendix 6: Cluster sampling from various Wards

Ward	Required sample size from Member	Required sample size from Non-member	Total
MPINJI	$\frac{151}{612} \times 50 = \mathbf{12}$	$\frac{1243}{5055} \times 50 = 13$	25
MYAMBA	$\frac{274}{612} \times 50 = 23$	$\frac{2213}{5055} \times 50 = 22$	45
BWAMBO	$\frac{193}{612} \times 50 = 15$	$\frac{1593}{5055} \times 50 = 15$	30
Total	50	50	*100*

Appendix 7: Questionnaires report card

A: QUESTIONNAIRES FOR SAMALLHOLDER GINGER FARMERS

My name is **Emmanuel Gabriel Jacob** a student from the International Institute of Social Studies of Erasmus University of Rotterdam in the Netherlands pursuing Master's in Economics of Development. I am currently carrying out research on the **Contribution of Cooperative Membership in Ginger productivity,** A case of ginger farming households in Same district of Kilimanjaro region. The information obtained will strictly be used for academic purposes only and will be treated with the highest confidentiality. I humbly request your help in completing this questionnaire. Thanks

SECTION ONE: DEMOGRAPHIC CHARACTERISTICS

1. What is your name (household head)? ……..
2. What is your marital status? 1= Married [ ] 2= Single [ ] 3= Divorced [ ]
3. What is your sex? 1= Male [ ] 2= Female [ ]
4. Who is the head of the family? 1=Father [ ] 2=Mother [ ]
5. What is your age? ……. years (household representative)
6. What level of education have you attained?
7. What is your highest grade of education? 1= none [ ] 2=Primary [ ] 3= Secondary school [ ]5= Tertiary [ ] 6= University [ ]
8. How many household members do live in this house?…… (a)Children…….(b)Adults …….(c) Dependent ……..

SECTION TWO: GINGER PRODUCTION

1. Who runs the ginger farming in day-to-day activities?.....
2. Who makes the major decision in ginger farming in terms of inputs and marketing?.....
3. Did you participate in ginger production in the last harvest season? 1= Yes [ ] 2= No
4. For how long have you been participating in ginger production? ……. (Years)
5. What size of the land did you cultivate in the last harvest season (in Acres)?
   a. 0 – 0.9 ( ) b. 1-1.99 ( ) c. 2-2.99( ) d. 3-3.99 ( ) e. 4-4.99( ) f. 5+ ( )
6. Means of land ownership. (a) owning ( ) (b) hiring ( )

7. Did you use fertilizers on plot in the last harvest season? [ ] 1=Yes 2=No.
8. What type of fertilizer did you use? (a) Chemical ( ) (b) organic ( ) (c) Composite.
9. Where did you buy fertilizer?

a. local collected ( ) b. cooperative ( ) c. local supplier ( ) d. private companies(

10. What type of cultivar did you plant?
    a. Local variety ( ) b. Improved variety ( )
11. Where did you buy the ginger sets(cultivars) from?
    a. Extracted from last season harvests ( ) b. cooperative ( ) c. local supplier ( ) d. private companies( )
12. Did you access and receive any credit for ginger production?[ ]1=Yes 2=No
13. Where did you get the loan?
    a. Relatives/friends ( ) b. *VICOBA/SACCOS ( )* c.Cooperative( ) d. Banks ( )
14. Why did you prefer taking the loan from that source?.....
15. Why did you or did not take the loan from Mamba Ginger Rural Co-operative Society limited?.....
16. Who recommended you to go for that loan in selected source?.....
17. What amount did you get? …….. (Tsh)
18. What was the repayment schedule? ……
19. What is the interest rate? ……
20. For how long do you repay the loan? ……
21. Did you receive any extension advisory services on your plot in the last harvest season? [ ] 1=Yes 2=No.
22. If yes, where did you get from? a. cooperative ( ) b. government ( ) c. private organization( )
23. What type of extension services did you get? a. good agronomic practices ( ) b. post-harvest handling ( )
24. Frequency of getting extension services during production season (planting, weeding, and harvesting) …….
25. Did you harvest any ginger on the cultivated plot in the last two harvest seasons? 1= Yes [ ]2= No [ ]
26. Is there any variation in the quantity produced? 1=Yes [ ] 2=No[ ]
27. If yes, what was your production quantity of the previous harvest

compared to the current harvest? Previous harvest (2020)…..kg: current harvest (2021)…..kg

28. What factors contributed to the variation?.....
29. Do you think cooperative contributed to this variation?1=Yes [ ] 2=No[ ]
30. If Yes, explain how?.....
31. Did you sell any of the ginger produced in the last harvest season? 1= Yes [ ] 2= No [ ]
32. Where do you sell your ginger produce? (a) Cooperative ( ) (b) Middlemen ( ) (c) others, specify…….
33. Do you sell your ginger output on cash or on loan to buyers? a. On cash [ ] b. On loan [ ] c. On exchange for Agricultural inputs [ ]
34. What amount of ginger do you sell to your buyers?.....kg?(a) cooperative…….kg (b) Middlemen……kg (c)other private buyers……..kg
35. What was the price of ginger last season? …… Tsh
36. Are you a member of any farmer cooperative? 1= Yes [ ] 2=No [ ]
37. If yes, what influenced you to join the farmer association? a. access to inputs ( ) b. access to markets and information ( ) c. access to credit ( ) d. access to trainings( ) e. social cohesion ( ) f. good ginger price ( ) g. other, specify……
38. Please explain the answer you chose in question 36……
39. If No in question 36, what are the reasons for not joining the cooperative? a. no trust in management [ ] b. corruption in the management[ ]c. zero benefits[ ] d. other, specify……..
40. Please explain the answer you chose in question 36……
41. What are the social benefits that you get from the cooperative?.....

42. What challenges are you facing in ginger production and marketing? …… …… …… ……

43. What option do you think can be adopted to address the challenges?……

……

……

……

"THANK YOU FOR YOUR COOPERATION"

B: **QUESTIONS FOR CHAIRPERSON OF COOPERATIVE**

My name is **Emmanuel Gabriel Jacob** a student from the International Institute of Social Studies of Erasmus University of Rotterdam in the Netherlands pursuing Master's in Economics of Development. I am currently carrying out research on the **Contribution of Cooperative Membership in Ginger productivity,** A case of ginger farming households in Same district of Kilimanjaro region. The information obtained will strictly be used for academic purposes only and will be treated with the highest confidentiality. I humbly request your help in completing this interview. Thanks

SECTION ONE: DEMOGRAPHIC CHARACTERISTICS

1. What is your name? ……..
2. Position of the respondent in the Cooperative administration……...
3. What is your marital status? 1= Married [ ] 2=Single [ ] 3= Divorced [ ]
4. What is your sex? 1= Male [ ] 2= Female [ ]
5. What is your age? ……. years
6. What is your highest grade of education? 1= none [ ] 2=Primary [ ] 3= Secondary school [ ]5= Tertiary [ ] 6= University [ ]

SECTION TWO: COOPERATIVE INFORMATION

7. What are the main objectives of the cooperative?

   (a)…….

   (b)……

   (c)……

8. How many farmers are members of the cooperative?.....
9. How does a cooperative fill administrative position?.....
10. How does the cooperative help farmers get access to the market for ginger output?

    ……..

11. Did you get any business or financial management training?
    ……..
12. What are the benefits members receive from the cooperative?.....
13. Does a cooperative have a training program on ginger for improving members' ginger production skills?.....
14. Do you think there is a production performance gap between members of cooperatives and non-member of the cooperative?.....
15. What are the achievements of the cooperative since its formation?.....
16. What are challenges cooperative faces?.....
17. What is the coping mechanism for addressing the mentioned challenges?.....

"THANK YOU FOR YOUR COOPERATION"

C: QUESTIONS FOR GOVERNMENT DISTRICT OFFICIALS

My name is **Emmanuel Gabriel Jacob** a student from the International Institute of Social Studies of Erasmus University of Rotterdam in the Netherlands pursuing Master's in Economics of Development. I am currently carrying out research on the **Contribution of Cooperative Membership in Ginger productivity,** A case of ginger farming households in Same district of Kilimanjaro region. The information obtained will strictly be used for academic purposes only and will be treated with the highest confidentiality. I humbly request your help in completing this interview. Thanks

SECTION ONE: DEMOGRAPHIC CHARACTERISTICS

1. What is your name? ……..
2. Position of the respondent in the government administration ……...
3. What is your marital status? 1= Married [ ] 2=Single [ ] 3= Divorced [ ]
4. What is your sex? 1= Male [ ] 2= Female [ ]
5. What is your age? ……. years
6. What is your highest grade of education? 1= none [ ] 2=Primary [ ] 3= Secondary school [ ]5= Tertiary [ ] 6= University [ ]

SECTION TWO: COOPERATIVE INFORMATION

7. What are the main objectives of the cooperative?

   (a)…….

   (b)……

   (c)……

8. How many farmers are members of the cooperative?.....
9. How does a cooperative fill administrative position?.....
10. How does the cooperative help farmers get access to the market for ginger output? ……..
11. What is the ginger production trend?.....
12. Is there a difference in production before and after formation of Mamba Ginger Rural Society Cooperative?.....
13. How does the cooperative contribute to ginger productivity?

    ……..
14. What are the benefits members receiving from the cooperative?.....
15. Does a cooperative have a training program on ginger for improving members' ginger production skills?.....
16. Do you think there is a production performance gap between members of cooperatives and non-member of the cooperative?.....
17. What are the achievements of the cooperative since its formation?.....
18. What are challenges cooperative faces?.....
19. What is the coping mechanism for addressing the mentioned challenges?.....

"THANK YOU FOR YOUR COOPERATION"