From a Loser to a Winner: How can Collective Marketing Increase Market Access among Smallholder Farmers in Tanzania?

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Abstract

This study was designed to determine the influence of production, socio-economic, and marketing factors on market access among smallholder farmers when mediated by collective marketing. Most smallholder farmers are losers because of various marketing challenges. However, to make them winners is to increase their market access. This means a broad range of factors needs to be mediated by collective marketing. Additionally, structural equation modeling (SEM) was used to analyze relationships. The findings of the study were in favor of the hypotheses. This is because all the results showed a positive and significant relationship (production factors β=0.191, p=0.017, socio-economic factors β=0.251, p=0.000, marketing factors β=0.663, p=0.000, and collective marketing β=0.653, p=0.000). Hence, all the variables were important in explaining the market access decisions among smallholder farmers. Also, the SOBEL test was conducted to test the mediating effect of collective marketing, and the findings indicate that it is a partial mediator. The study makes both practical and theoretical contributions to smallholder farmers and market access in the study field. It argues that smallholder farmers have to develop skills related to collective marketing to increase market access.

Keywords: Production factors, socioeconomic factors, marketing factors, market access, collective marketing.

Introduction

The term "smallholder farmers" is difficult to define precisely. Therefore, previous studies have defined smallholdings in various ways (Abu *et al.,* 2014; Chamberlin, 2007; Bienabe *et al.,* 2004; Phiri *et al.,* 2019). However, the concept of smallholder farmers varies by country and agroecological region in the developing country context. Most of these studies have looked down on those who cultivate less than one hectare of land in densely populated areas and those who cultivate 10 hectares of land in the least populated areas. Chamberlin (2007) defined smallholder farmers based on their holding size, wealth, market orientation, and levels of risk vulnerability. In the same line, Bienabe *et al.* (2004) defined smallholder farmers in terms of their restricted resource endowments and those who depend on household members for the majority of labor or those who have a subsistence focus where the farm's primary goal is to generate the bulk of the household's consumption of food. Also, Abu *et al.* (2014) defined smallholder farmers based on their restricted access to agricultural markets, cultivating less than 3.5 hectares, and relying on household members for the majority of labor. These definitions show "limited resource access" as the major common characteristic of smallholder farmers. Even though they have limited access, small-scale farmers in developing countries are thought to be important solutions to global food security problems.

More than 80% of the world's farms run on less than two hectares of soil, which justifies that many small-scale growers engage in agriculture compared to large-scale growers. In addition, according to Mango *et al.* (2017), the livelihood of the majority of the rural population of most of the emerging economies depends on

the agricultural activities of which smallholder farmers appear to be the main actors. It is suggested that this dependence will still grow due to the current trend of increasing the global population. To meet the future food demands of a rising population, agriculture in Africa needs to undergo significant transformational changes, especially by focusing on solving challenges related to smallholder farmers. One of the respected African leaders, the national founding father of Tanzania, the late Julius Nyerere, noted in 1982 that the importance of agriculture in African development would lead one to expect that small agricultural producers' needs would be the central reference point of economic planning. Instead, agricultural producers are treated as if they are peripheral.

Although decades have passed, most farmers in developing countries, especially those operating on a small scale, face many challenges that prevent them from effectively contributing to economic growth. Most of them are often caught in a vicious cycle of low intensity, low yields, and subsistence-oriented cultivation with inadequate income to make beneficial investments (Ismail *et al.,* 2015). Fan & Rue (2020) noted that to see smallholders involved in the economy's mainstreaming, they should be encouraged to transit more commercially into agricultural activities. Although linking poor farmers to markets is one way to break the cycle, it involves overcoming several obstacles and market flaws. Smallholder farmers can face significant risks because they lack the expertise, technology, and financial resources needed to produce a marketable surplus or supply buyers with the quality, quantity, and types of commodities they want. However, the reviewed literature has proven that most of these challenges facing smallholder farmers originated in the 1980s when most African governments involved structural adjustment programs (SAPs) to improve economic status.

Nevertheless, these programs resulted in serious uncontrolled market liberalization, which reduced government control over several important agricultural activities. In addition, these programs created gaps in the roles that were previously done by the government ministries. As a result, smallholder farmers are now exposed to food insecurity, poor access to markets, and low incomes generated from agricultural activities, extension services, and poor access to credit (Ismail & Changalima, 2019). Market participation challenges facing smallholder farmers, particularly in Tanzania, emerged in the 1980s when the government stopped offering direct market services to smallholder farmers through marketing boards. Before that time, the government appeared to provide all-important production and market services, such as harvest collection, quality evaluation, purchasing, and storage.

Marketing boards were disbanded between the 1980s and 1990s because their operations proved economically unsustainable. Consequently, smallholder farmers face many problems because of this act, such as poor rural transportation systems, weak cooperative societies and smallholder farmers' groups that don't work together very well. Regardless of this, improving market participation by increasing market access has become a key strategy in promoting rural economic development and enhancing smallholder farmers' income (Abdul-Rahaman & Abdulai, 2020). Improved market access offers an essential means for increasing rural incomes through enjoying premium marketing prices that are not offered by middlemen or traders in the farming areas, particularly in developing countries. Additionally, accessing the market is important as it gives smallholder farmers the denial of industrial exploitation issues. However, most of these are compounded by low demand, poor agricultural production systems, and knowledge quality due to long market supply chains and low returns (Markelova & Mwangi, 2010; Kiprop *et al.,* 2020). For smallholder farmers, market participation entails transitioning from subsistence farming, which entails producing food for personal consumption, to market interaction mode, which also involves farming for commercial purposes. Market access also includes regular market visits to exchange agricultural products for money. Apart from that, commercialization of subsistence agriculture entails an opportunity to compete in the output market, and therefore, transitioning from subsistence farming to more

market-oriented development is referred to as a basic means of increasing smallholder farmers' income and wellbeing (Dube & Guveya, 2016; Florence *et al.,* 2017; Ahmed, 2017; Rubhara & Mudhara, 2019).

Nonetheless, several challenges still impede smallholder farmers from effectively accessing output markets. The main challenges are high transaction costs due to poor and ineffective infrastructure, market imperfections, and credit and extension services. Other challenges include underdeveloped market facilities, insufficient market knowledge, and a lack of socio-economic development. Also, most of the rural markets are far away from many villages. As a result, they are not accessible by road, especially during rainy seasons, hence increasing the cost of transportation, which creates an additional price obstacle for smallholder farmers who want to sell their goods to the official markets (Abokyi *et al.,* 2020; Kilelu *et al.,* 2017; Maspaitella *et al.,* 2018; Meemken & Bellemare, 2020; Sebatta *et al.,* 2014).

Although the topic of market access has become an exciting part of the literature, the reviewed past studies have ended up providing direct relationships with inconclusive results between several factors and access to markets without paying attention to other vital variables that may mediate the relationship between these challenges and access to markets. This gap is significant to be considered because important mediating variables may solve challenges and facilitate adequate market access among smallholder farmers. Asad *et al.,* 2016; Muzaffar Asad *et al.,* 2016 concluded that inconclusive results in past studies might need more studies to determine in which context other factors may perform beneficially concerning challenges. Therefore, the researchers can identify other variables that can improve the relationship between independent and dependent variables. One of the best strategies for increasing the market access of smallholder farmers is collective marketing (Okelai *et al.,* 2020).

Compared to developing countries, smallholder farmers in most developed countries have discovered that they can increase their income and productivity by collaborating with other farmers to sell their products. In this way, acting individually means that smallholder farmers would continue to have a slight chance to access market benefits directly. The absence of clear theoretical frameworks for evaluating the challenges associated with poor market access among smallholder farmers has institutionalized collective marketing as the primary vehicle for market linkages and interventions for smallholder farmers to achieve effective outcomes (Okelai *et al.,* 2020). Ideally, this is the only way for smallholder farmers to compete with large-scale farmers by banding together and joining a farmer's marketing organization (Stockbridge *et al.,* 2003). The idea behind this collective marketing strategy is that smallholder farmers would be able to market their products as successfully as large-scale farmers if they could sell their combined products and ensure that their products are of consistently high quality. Through group marketing, smallholder farmers who produce significant small amounts for sale can collectively have bargaining power against merchants willing to pay a fraction of the wholesale market price to the individual smallholder farmer because of the little negotiating leverage in the marketplace. Apart from collective bargaining, collective marketing offers networking with potential customers, establishes relationships with current buyers, translates market signals to farm output, and aligns with market demand. Collective marketing also offers supervision a framework for conflict management and commercial operations, essential determinants of market access (Stockbridge *et al.,* 2003). Therefore, collective marketing can increase market reach by providing additional storage, transportation, and refining.

It also has the advantages of spreading costs over a greater crop volume and helping in sales activities. Apart from that, all members, acting as individual farmers, can carry out their responsibilities in accordance with calculated costs and benefits that take into account the economic, social, and production concerns of the surrounding area (Bihrajihant Raya, 2014). A group's behavior can adequately facilitate social networking and economic exchange. Members in the social network can enjoy the presence of others in various dimensions,

such as organizational capacities, proper and formalized market structure, good governance structure in the groups, shared vision, and business development services. Therefore, it gives smallholder farmers a choice of whether to work collectively or individually to maximize economic and societal benefits while also considering their personal preferences and values during the process. To this end, collective marketing may play a mediating role between various market participation factors and market access.

Theoretical review

When James March and Herbert Simon established organization theory in 1958, they attempted to explain how individual humans can be bounded, and at times, downright thick, yet for organizations made of such imperfect raw materials to accomplish their particular goals. It emphasizes that a chain is only as strong as its weakest link and then explains how a chain made up of all weak links can be so incredibly strong. Smallholder farmers who participate in collective marketing can be transformed from losers to winners in this manner. Furthermore, the theory emphasizes that the combined resources of individuals help to effectively achieve goals that they might not possibly achieve individually (Yang *et al.,* 2013). This idea has been used in various disadvantaged groups, with particular attention given to smallholder farmers. Due to the limited resources, most individual smallholder farmers have missed multiple opportunities presented in the marketplace, including reasonable market prices, market practices, and other infrastructure (Asante *et al.,* 2011; Soe *et al.,* 2015). Therefore, smallholder farmers can increase and make easy access to market facilities, access market-based information, increase access to credit, and improve general marketing activities by joining smallholder farmer-based organizations (Asante *et al.,* 2011; Nwafor *et al.,* 2020).

According to Selznick (1948), Organizations cooperate with adaptive social systems that constitute the rationally ordered instruments for achieving stated objectives. The basic principle is that organizations do exist because of human needs. However, when the fit between the organization and the individual is inadequate, individuals will always be exploited.

Generally, organizational arrangements facilitate the accomplishment of agreed goals by allocating responsibility and functions, which are defined as a system of consciously coordinated activities or forces involving one or more people. Wortmann-Kolundzija, (2019) posted that market-driven agricultural transformation requires smallholder farmers to, directly and indirectly, participate through farm organizations in order to compete efficiently with large-scale farmers. Furthermore, since most smallholder farmers' products are of low quantity and poor quality, smallholders, particularly from developing countries, have to increase participation in collective marketing, defined as an organization to increase market reliability in agricultural markets (Adanacioglu, 2017). This linkage will increase the empowerment of smallholder farmers in the integrated value chain development, especially in marketing.

According to the organization theory, organizations offer several benefits, including collective bargaining, access to information, and mobilization of resources. If all these factors are explicitly centered on the marketing focus, they present crucial collective marketing facts (Birken *et al.,* 2017). Through collective marketing, smallholder farmers can have solid and collective bargaining power for their benefits and common interests on the management side of the bargaining table with the buyers, intermediaries, and traders who are constantly using smallholder farmers' weak side (Okelai *et al.,* 2020). This is also supported by the institutional theory that prominently emphasizes the spread and adoption of formal organizational structures that mainly help weak individuals. Furthermore, institutional theory holds that standard practices are an important means of increasing the achievement of cultural and social shared expectations in new forms of organization. Based on the reviewed literature which supports the objective, the following hypotheses are formulated:

H1: Production factors significantly influence market access

H2: Socio-economic factors significantly

influence market access

H3: Marketing factors significantly influence market access

H4: Collective marketing significantly influence market access

H5: Collective marketing significantly mediates the relationship between market participation factors and market access

Methods and data

Population and sample size

This study adopted a cross-sectional design in which data was collected through structured questionnaires only once at a time. Specifically, the research was done in the central zone of Tanzania. The central zone was selected because it is among the agricultural zones with poor market access among smallholder farmers due to various challenges (Ismail *et al.,* 2015). The study identified smallholder farmers who are members of farm groups, of which the National Network of Farmers' Groups in Tanzania (NNFGT) was used. NNFGT is considered the official organization that brings together smallholder farmers from different parts of Tanzania to have a common voice. Although there is a variation in the specific number of smallholder farmers registered, the available information resulted in a sample size of 487 smallholder farmers. However, the actual sample included in the analysis was 483, resulting in a 99.2% response rate. After defining the population and the sample size, the random sampling procedure was used to select the sample population.

Data analysis

The analysis of quantitative data was conducted through AMOS (Analysis of Moment Structures) software using a structural equation model (SEM). SEM is a powerful multivariate analysis technique widely used in the social sciences (Amani, 2022). Besides, SEM includes two components, namely the measurement model and the structural model. In this study, the measurement model was done using confirmatory factor analysis to portray the pattern of observed variables for the latent constructs; production, socio-economic, and marketing factors in the hypothesized models. Similarly, confirmatory factor analysis was used in validating and finding the reliability of the measurements involved in the study (Smeda *et al.,* 2018). In the second place, the structural model was used to analyze direct and indirect relationships between production, socio-economic and marketing factors concerning collective marketing and market access. All production, socio-economic, marketing, and collective actions, as well as market access, were defined using latent variables.

Apart from that, the SOBEL test was conducted to test the strength of the mediating effect of collective marketing between independent and dependent variables. During the process, criteria provided by Baron & Kenny, (1986) were used. 1. Independent variables and dependent variables must be related in a significant way; 2. Independent variables and a mediating variable must be related in a significant way; and 3. The mediating variable and the dependent variable must be related in a significant way. Once the mediator's effect has been controlled, the independent variables' influence on the dependent variable should no longer be relevant for a full mediation. Hence, partial mediation is defined as a relationship that is significant but has a diminished effect.

Variable measurements

Table 1 indicates the measures of variables and how they were operationalized. It includes main constructs such as production factors, socio-economic factors, marketing factors, collective marketing, and market access. The table also consists of the indicators for each main construct relative to their measurements (Appendix 1).

Results and discussion

Conformity factor analysis

Confirmatory Factor Analysis (CFA) is a technique for validating data before analysis. The CFA aimed to confirm the explored factor structure, evaluate the model, and determine the latent construct's unidimensionality. Generally, the study confirmed that the measurement model met the necessary 0.6 thresholds. When all measuring objects have appropriate factor loadings for the respective latent build,

it is unidimensional. On the other hand, the confirmatory factor analysis confirmed that all the covariances are less than 0.80. This ensured that there was no multicollinearity across all constructs.

Model fit

SEM has several fitness indexes that indicate how well the model fits the results. The chi-square/df ratio, the Comparative Fit Index (CFI), the Normed Fit Index (NIF), the Goodness-of-fit index (GFI), and the Root Mean Square Error of Approximation (RMSEA) were used as Goodness of Fit indices (GOF). The literature identifies these as the best fit (Hooper *et al.,* 2008; López-Cabarcos *et al.,* 2015; Oney *et al.,* 2017). The computed measurement model indicated that the CMIN/DF was 1.890, lower than the recommended value of 3.0 for the best model fit. Furthermore, the model's GFI = 0.974, NIF = 0.928, and CFI = 0.986 reached the required threshold of 0.9, while the RMSEA value of 0.047 was marginally lower than the suggested limit of 0.05. Since the tests of goodness of fit indices (GOF) were within the recommended values, it can be concluded that the measurement model matched the sampled data reasonably well (Table 2).

Additionally, discriminant validity was tested using the Fornell and Larcker Criterion. According to Fornell & Larcker, (1981), if the maximum shared variation (MSV) is less than the AVE, discriminant validity is achieved (Table 3). Also, square roots of AVE values are above multiple correlations between the respective constructs. The findings indicated in Table 4 provide adequate proof for claiming discriminant validity in this study. On the other hand, reliability refers to how accurately the measurement model measures the expected latent constructs. Cronbach's alpha, also known as the reliability coefficient, was used to figure out the reliability of each instrument item in this study. According to Nunnally, (1994), the alpha value of 0.7 indicates a high degree of internal reliability. Table 3 shows that all the variables' Cronbach's alpha values were above 0.7, indicating a reasonable degree of internal reliability. Also, construct reliabilities were greater than 0.7. This further indicates that the data is reliable (Bagozzi & Yi, 1988).

Hypothesis testing

After conducting a confirmatory analysis, the study engaged in testing the developed hypotheses.

Table 2: The Fitness Indexes for new Measurement Model

Category name	Index Name	Index value	Level of acceptance
Absolute fit	RMSEA	0.047	< 0.05
	GFI	0.974	> 0.90
Incremental fit	CFI	0.986	> 0.90
	NFI	0.928	> 0.90
Parsimonious fit	CMIN/df	1.890	< 3.0

Validity and reliability of a measurement model

Convergent validity and discriminant validity were checked to ensure that the instrument assessed what was expected to be measured by latent constructs. The convergent validity of each construct was verified by computing the Average Variance Extracted (AVE). For validity to be obtained, the AVE value should be 0.5 or higher. The results in Table 3 show that all AVEs were greater than 0.5, indicating strong convergent validity.

Production factors

Table 5 shows that the production factor (PRF) is explained using farm size (FAS), household size (HOS), extension education (EXE), and production assets (PRA). This construct had β=0.191 (19%), p-value=0.017, indicating that production assets have a favorable and meaningful relationship with market access (MA). As a result, hypothesis H1 was supported. The most logical reason is that households with many household members and a large farm size produce more. These are the

most critical factors in increasing agricultural production (Yan *et al.,* 2019; Zhang *et al.,* 2019). Production assets, likewise, play an essential role in increasing production. Power tillers, for example, are valuable assets for improving production, particularly for smallholder farmers. Furthermore, extension education increases access to extension programs, which helps to encourage fertilizer, credit, pesticide, and other technology adoption. In general, smallholder farmers who use extension services have a higher production rate than those who do not access these services (Emmanuel *et al.,* 2016). This is supported by Raj & Hall (2020), who posted that, because of the high production, smallholder farmers who often use family labor tend to increase levels of commercialization. Thus, increased agricultural outputs serve as a link between farm production factors and market access. In most cases, particularly in developing countries, smallholder farmers sell surplus agricultural produce after consumption.

Socio-economic factors

Table 5 shows that the socio-economics Factors (SEF) included Market Distance (MAD), Transportation Facilities (TRF), Storage Facilities (STF), Road Conditions (ROC), Transporting Costs (TRC), Middlemen Cost (MIC), and Membership (MEP). The results show that, SEF has β=0.251 (25%) and $p<0.001$. Therefore, hypothesis H2 was supported. Compared to poor socio-economic influences, smallholder farmers with numerous facilities such as transportation, storage, and associations appear to have strong market

Table 3: Reliability and validity

Constructs	Items	Internal Consistency Reliability	Factor loadings	AVE	MSV	Construct Reliability
PRF	FAS	0.841	0.701	0.583	0.490	0.846
	HOS		0.923			
	EXE		0.691			
	PRA		0.721			
SEF	MAD	0.951	0.933	0.767	0.490	0.958
	TRF		0.921			
	STF		0.841			
	ROC		0.721			
	TRC		0.841			
	MIC		0.932			
	MEP		0.934			
MAFS	MAI	0.809	0.682	0.515	0.372	0.810
	MAC		0.721			
	MAF		0.754			
	MAP		0.721			
CM	ORC	0.892	0.876	0.702	0.372	0.921
	MAS		0.842			
	GOS		0.797			
	SHV		0.745			
	BUS		0.911			
MA	MAA	0.811	0.834	0.689	0.281	0.816
	COS		0.834			

Table 4: Discriminant validity

	CR	AVE	MSV	PRF	SEF	MAFS	CM	MA
PRF	0.846	0.583	0.490	0.763				
SEF	0.958	0.767	0.490	0.700	0.876			
MAFS	0.810	0.515	0.372	0.600	0.560	0.718		
CM	0.921	0.702	0.372	0.410	0.380	0.610	0.838	
MA	0.816	0.689	0.281	0.500	0.360	0.530	0.400	0.830

linkages (Ebewore, 2021). Similarly, strong road connectivity lowers transportation costs and decreases the risk of being targeted by middlemen. According to Berg *et al.* (2018), the rural road networks improve market connectivity among smallholder farmers in areas where agricultural production conditions are better. Lower transportation costs and less middlemen problems could be among these conditions (Adeoti *et al.,* 2014).

Marketing factors

Table 5 shows that the marketing factors (MAFS) such as Market Information (MAI), Marketing Competency (MAC), Market Facilities (MAF), and Market Practices (MAP) were found to have β=0.663 (66%) and p< 0.001. This suggests that the relationship is significant, and hence the hypothesis H3 was supported. The plausible justification is that market-related factors such as access to information and marketing competency are essential factors for increasing the decisions of smallholder farmers to participate in the market. Having accurate information about prices and readily available buyers increases the likelihood that farmers will sell at marketplaces rather than at the farm gate. Similarly, market factors such as marketing competency are critical for market access because they enable smallholder farmers to look ahead and describe the marketing skills and attitudes they will need in the future (Issahaku, 2014; Opolot *et al.,* 2018). Essentially, these skills provide farmers with a solid foundation on how to negotiate with buyers clearly and objectively. Ineffectiveness and inefficiency in conducting marketing activities are among the shortcomings that prevent smallholder farmers from effectively accessing markets. Smallholder farmers benefit from marketing competency because it enables them to engage in particular characteristics and increase market access. According to Mashavira *et al.* (2019), competencies can be measured by a person's behaviors as performance criteria. As a result, smallholder farmers can explain these behaviors as modern market awareness, risk evaluation in marketing activities, time management in dealing with marketing problems, and identifying their circle of interests against buyers and traders. Besides that, market practices such as cleaning produce in market places, weighing, and grading are also essential factors for smallholder farmers' market access, especially when linked to market facilities such as weighing bridges, grading facilities, and cleaning facilities (Adeoti *et al.,* 2014).

Collective marketing

Collective Marketing (CM) was found to have β=0.653 (65%) and p<0.001. This suggests that the relationship is significant, and hence the hypothesis H4 was supported as indicated in table 5. This means that with every standard deviation increase in collective marketing, market access increases by 65%. Kiprop *et*

Table 5: Regression analysis output

Hypothesis				β	SE.	CR.	P-value	Decision
H1	PRF	→	MA	.191	.084	2.273	.017	Supported
H2	SEF	→	MA	.251	.031	8.096	***	Supported
H3	MAFS	→	MA	.663	.070	9.471	***	Supported
H4	CM	→	MA	.653	.042	15.555	***	Supported

*** *implies p-value is < 0.001*

al. (2020), also discussed the importance of collective marketing. They noted that small-scale farmers can benefit from collective marketing because it helps them get to markets and take advantage of market opportunities. It can also help farmers diversify their incomes and increase agricultural productivity, which can help them get out of poverty.

Mediating effect of collective marketing (SOBEL test)

This study discusses how collective marketing interacts with market participation factors (MPF); production, socio-economic, and marketing factors, to understand market access among smallholder farmers. Based on the results of the SOBEL test (table 6), it was revealed that collective marketing is a partial mediator because all the criteria suggested by (Baron & Kenny 1986) were met. According to Baron & Kenny (1986), the first criterion is that, independent variable must offer a significant relationship to the dependent variable (MPF→MA). In this study, this criterion was met. The second criterion requires a significant relationship between the independent and a mediator variable (MPF→CM). This was also achieved. The third criterion requires the mediator variable to significantly affect the dependent variable (CM→MA). This was also achieved.

proposed that supportive policies related to enhancing production, social, economic, and market factors are essential determinants for promoting farmers' transformation to optimize the benefits of collective action in the high-value market. Furthermore, stable markets, such as supermarkets and institutions with higher volumetric collective marketing, intensify collective marketing. So, small-scale farmers in developing countries need to work together to keep access to markets and improve marketing efficiency.

Additionally, farmers' bargaining power increases due to collective marketing, which lowers the cost of bringing their goods to market. Thus, collective marketing lowers transaction costs and allows smallholders to access market resources that would otherwise be unavailable from the private sector or the government. Similarly, smallholder farmers can also profit from collective marketing because it helps them compete more efficiently with large-scale farmers, processors, and intermediaries, who can exploit them and reduce their bargaining power (Asante *et al.,* 2011). As the organization theory insists, individuals who work alone have little chance of achieving their goals on time. As a result, the findings of this study show that collective marketing is the pooling strategy of smallholder farmers to increase their bargaining power and obtain a better price by promoting

Table 6: SOBEL Test Output

Variables	Coeff	s.e	t	Sig(two)
MPF→MA	.4474	.0405	11.0469	.0000
MPF→CM	.3826	.0308	12.4221	.0000
CM→MA	.9614	.1182	8.1337	.0000
MPF→CM→MA	.1548	.0783	1.97701	.0032

.0000 implies p-value is < 0.001

Finally, the fourth criterion needs the significant levels to decrease so as to have a partial mediation or the relationship to be insignificant so as to have a full mediation. In this study (MPF→CM→MA) indicates the path coefficient decreased. Hence CM was found to be a partial mediator. Therefore, hypothesis H5 was supported. These findings are in line with Ochieng *et al.,* 2018; Mango *et al.,* 2017, who

farmers' collaboration and solidarity. Thus, the collective marketing method has proven to be a success among smallholder farmers. Therefore, when it comes to smallholder market access, it is important to look at three broad groups of variables: production, socioeconomic, and marketing factors, and the indicators that show how well collective marketing works.

Study conclusion, implications, and recommendations

The study concluded that all three factors production, socio-economic, and marketing are essential indicators for market access, whether controlled directly or indirectly through the mediation of collective marketing. Indirectly, collective marketing mediated the impacts of production, socio-economic, and marketing factors on market access. Thus, this study has implications. First, market access for small-scale farmers has recently been studied in a very basic way. This has prompted researchers to call for more research into developing and testing theoretical models that focus on market access success factors.

More specifically, it is essential to study success factors such as production, socio-economic characteristics, and marketing factors of smallholder farmers through other mediating factors such as collective marketing to increase the ability of smallholder farmers to access markets. Therefore, the findings contribute to the theoretical understanding of these three factors that explain the market access among smallholder farmers when mediated by collective marketing.

Second, this research has many practical implications. The study results indicate that practitioners should think about developing skills related to their area of practice and the nature of smallholder farmers rather than the factors generally used across all developing countries to define the marketing challenges facing smallholder farmers.

On the other hand, study results suggest that using additional features such as collective marketing as criteria for making market access decisions will help banks and other supporting institutions increase agricultural production and farmers participate in markets. These results can also aid governments, extension service educators, and trainers in identifying fundamental issues that smallholder farmers must address to be effective. Aside from the implications, the study has limitations and suggestions for future research. To begin, the data for this study was gathered in Tanzania's central zone. Accordingly, it is not guaranteed that the applicability of these findings might work effectively in other parts of developing countries. This is because there is a slight difference in the nature and characteristics of smallholder farmers across other different areas. Second, the analysis examined the relationship between variables using a cross-sectional approach. It's still unclear how these factors can affect market access over time. It is suggested, for example, that the success of collective marketing could have more impact on some elements of social economics, production, and market factors if farmers became aware of its importance. Thus, the future study should adopt a longitudinal study to consider changes of these factors over time.

Also, market access was measured as a binary outcome of market availability and competitiveness. This means other essential indicators can be used to measure market access to enhance broader understanding. For policymakers, it is proposed that governments in developing countries and private institutions develop a specific dialogue system at the national level to establish an agreed legal framework to raise awareness among smallholder farmers about the importance and connection factors to rural and urban areas' markets. Additionally, other essential characteristics that define poor market access are centered on technological and environmental factors that this study has not included. This means that future research should include both internal and external technical-environmental variables in the analytical model in order to understand other factors that affect smallholder farmers' access to the market.

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Appendix 1

Table 1: variable measurements

Main construct	Indicators	Measurement
Production factors (PRF)	Farm size (FAS)	Size of the land used for cultivation
	Household size (HOS)	Number of productive members of a family
	Extension education (EXE)	1 = if attended trainings related to agricultural production, 0 = otherwise
	Production assets (PRA)	Ownership of the productive assets (nominal scale)
Socio-economic factors (SEF)	Market distance (MAD)	The distance measured average distance (ordinal scale)
	Transportation facilities (TRF)	1= access to available transportation facilities, 0 = otherwise
	Storage facilities (STF)	1 = access to available storage facilities, 0 = otherwise
	Road conditions (ROC)	Conditions of the rural roads (Ordinal scale)
	Transporting costs (TRC)	Average transportation costs (Ordinal scale)
	Middlemen costs (MIC)	Average middlemen costs (Ordinal scale)
	Membership (MEP)	1 = if smallholder farmer is a member of associations, 0= otherwise

Main construct	Indicators	Measurement
Marketing factors (MAFS)	Market information (MAI)	1 = if smallholder farmer access market information, 0= otherwise
	Marketing competency (MAC)	Marketing competency-based training (Ordinal scale)
	Market facilities (MAF)	1 = if smallholder farmer access market facilities, 0 = otherwise
	Market practices (MAP)	1 = if smallholder farmer access market practices, 0 = otherwise
Collective marketing (CM)	Organizational capacities (ORC)	The capacity of the farm organization in relation to collective marketing (Ordinal scale)
	Market Structure (MAS)	Market structure of the farm organization in relation to collective marketing (Ordinal scale)
	Governance structure (GOS)	The governance structure of the farm organization in relation to collective marketing (Ordinal scale)
	Share vision (SHV)	A shared vision among members in the farm organization in relation to collective marketing (Ordinal scale)
	Business development services (BUS)	Business development services in the farm organization in relation to collective marketing (Ordinal scale)
Market access (MA)	Market availability (MAA)	1 = market is more available through collective marketing, 0 = otherwise
	Competitiveness (COS)	1 = collective marketing help members to be competitive in the market place, 0 = otherwise