

Determinants of Operational Sustainability of Agriculture Marketing Co-operatives in Kilimanjaro Region, Tanzania

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Abstract

Sustainability of Agriculture Marketing Co-operatives (AMCOS) has been an intricate issue that is debated day to day. This study assesses determinants of operational sustainability of AMCOS, specifically focused on operational model, member participation and the business environment. The theoretical framework of the paper was resource dependency theory. The sample size of the study was 400 owners (members and board members). Respondents selected from 8 primary AMCOS, 4 from poorly operational sustainably AMCOS and 4 from actively operational sustainably primary AMCOS. Questionnaires were administered to collect data. The questionnaire return rate were 288 (72%) respondents and since a response rate of 60 percent is good for data analysis and reporting and rate of 70 percent and overall is excellent, the 288 questionnaires were analyzed for this study. Quantitative approaches were deployed to analyze data involving descriptive and inferential statistics using SPSS 20th version. The test of multiple linear regression model assumptions shows fitting of model in all assumptions (linearity, normality, homoscedasticity, autocorrelation and Multicollinearity). Findings showed that operational model influenced operational sustainability by (0.120) while business environment changes influenced operational sustainability by (0.486) and lastly Members' participations influence the operational sustainability by (0.196). Therefore, it is worthwhile saying that business environment had a higher contribution on AMCOS sustainability by 48.6% followed by member participations by 19.6% while business operation model had a 12% of the contribution. The study recommends more education on the use of entrepreneurial model of operations than traditional model. AMCOS members have to be provided with more education and knowledge on the usefulness of being involved in decisions of a co-operative. Business environment requires the bigger consideration than operational model and member participation in the interventions for enhancing effects on the co-operatives sustainability. The focus on coping strategies on climate change remains important to ensure sustainability of AMCOS.

Keywords: Sustainability, co-operatives, member, business, environment.

INTRODUCTION

Co-operatives have become important entities in our economic systems, especially in agriculture relevant to smallholder producers of various crops such as coffee (Skolastika, 2020). According to Nkhoma, (2011), co-operatives including Agricultural Marketing Co-operative Societies (AMCOS) have been facing different challenges one of them being poor operational sustainability. Some co-operatives including AMCOS tend to stop operating after some years since their formation and registration. Despite significant progress that is made in establishment of co-operatives and the role of co-operatives in poverty reduction, employment creation and reducing income inequality, operational sustainability of agriculture marketing co-operative societies has been a common problem that hinders the development of co-operatives in many countries Coltrain, Boland, & Barton, (2012). Most of co-operatives do not sustain for a long time therefore, members cannot be fully benefited by the co-operatives. There are a number of agriculture co-operatives that considered dormant; it is also common for members to withdraw from co-operatives. Tanzania agricultural co-operatives have been facing survival challenges as a result of the agricultural industrialization process. On January 2020, Tanzania Co-operative Development Commission (TCDC) has announced about 3436 co-operatives to be terminated from co-operative register, some of them being AMCOS. There can be different reasons to this, such as corruptions but also the reason can be because they have been stopped operation for several years that they are considered dormant co-operatives. Basically, sustainability of any business including a co-operative organization depend on different issues one of them being the

performance of the business, for this case the co-operative business, for example the functions of AMCOS are production, collection, processing, marketing and distribution of members' agriculture products. When these functions fail, the co-operative business will fail and the co-operative organization might fail to function sustainably as well. There is an interplay of issues that requires a balance in the issue of co-operative business and the co-operative organizations. Ensuring that the common business of an AMCOS operates profitably is an important drive to sustainability of co-operative business. The study conducted by Hafizah Khan, (2012) shows regardless of how useful member participation is in contributing towards performance for the case of their opinions during annual meetings, but still there is lack of participation from their members as some of the co-operatives viewed the co-operative not as important as other businesses. They only attend the annual meeting but not actively involved in the administration of those cooperatives. This might as well be caused by less profits obtain through the co-operative member sales, whereby increasing the number of innovative activities in AMCOS including value additions, VICOBA and other entrepreneurial activities might be a drive to ensure continuity and motivation of members to participate in AMCOS activities. The concept of member participation in co-operative business can therefore be taken as an important aspect for the development and viability of a co-operative. According to Rwekaza, G. C (2019) member ownership in primary Agricultural Marketing Co-operative Societies (AMCOS) is very crucial in guaranteeing democratic sustainability. There are various efforts made to ensure democratic governance in primary AMCOS

which are based on member owned practices. Sustainability is still far from being realized. Coltrain *et al.*, (2012) argued that the operations of AMCOS can either involve a traditional co-operative model or entrepreneurial model where by the ways of operation in each model varies and therefore influence differently the performance of AMCOS and the ways through which they are performing. Traditional co-operative model characterized by membership which is by common bond, collateral ownership, non-tradable shares, and controlled by members, also external people have no influence over co-operative matters. The other model is Entrepreneurial co-operative model in which there are two types of members, the insiders and outsiders. Outsiders only own shares. Ownership of shares is individual and not collective. Shares are also tradable in this model of co-operative operations so the share capital scope is widened. Investors have the right to vote. For ordinary members, shares are treated like in traditional co-operatives. The challenges found in each model can also be different and affect the operations differently and so have a different influence on the performance and sustainability of AMCOS. The business environment that contain internal and external environmental factors that affect all businesses operations including AMCOS business. AMCOS like other organizations has to be adapting to changes in business environment to survive marketing competition and changes of the global world. Kattookaran, (2015) noted that the Environment or surrounding is vital for the success of any business firm, regardless of their nature, small or medium, manufacturing or service. For business to survive in its area of operations, it must be well adapted to the environment in which it is operating. In general, all business decisions

are framed according to the business environment components like economic systems, political, social and legal factors. This is to say for AMCOS to be operating successfully and sustainably it must take into account of the business environment. Touching the issues of the models of co-operative operations, the challenges that affect sustainable operation of AMCOS, contribution of member participation in improving sustainability of co-operatives in Tanzania and the effects of changes in business environment in the performance of AMCOS is crucial in coming up with the determinants of operational sustainability of agriculture marketing co-operatives in Tanzania. Some efforts have been done to ensure sustainability and sustainable operation of co-operatives. A country level improvement will guarantee peace, fair terms of trade and good governance, to solve co-operative members' problems. Also, according to Anania P.F (2018), for co-operatives to help transforming agriculture sector into industrialization issues of good governance, stability, technical support, innovation and resilient capacity building should be given priority in industrialization and development policy agenda is General, Anania P.F (2018). But Coltrain *et al.*, (2012) has been observed that despite the efforts, co-operatives established they tend to operate in a very short period of time and seize operations. The study on determinants of operational sustainability of agriculture marketing Co-operative will be useful in ensuring sustainability of AMCOS in the future. This research is aimed at assessing determinants of operational sustainability of agriculture marketing co-operatives from the selected agriculture co-operatives in Kilimanjaro region, Tanzania.

Theoretical Framework: This research was guided by resource dependency theory. The theory was applied to inform the study on determinants of sustainability of AMCOS. The resource dependency was the dominant theory in the addressing sustainability of AMCOS. Davis & Cobb, (2009) Views organizations as interdependent with their environment, Organizations depend crucially their survival on other organizations and actors for resources. AMCOS as an agriculture organization also needs to interact with environment like other organizations, they need to find ways of managing this dependence and ensuring they get the resources and information they need. The main functions of the board are to maintain good relations with key external stakeholders in order to ensure the flow of resources. From this perspective the board is part of both the organization and its environment. For traditional co-operatives, the potential for co-operatives to use their boards to 'manage' external dependencies is much more constrained than entrepreneurial ones, as board members have to be elected from the co-operatives membership. However, it is usually possible for co-operatives to co-opt board members to bring in people with additional experience, contacts or skills, although it is unclear how commonly this strategy is used. Proper linkage between AMCOS and outside environment is crucial for ensuring sustainability of AMCOS; also, entrepreneurial co-operatives are better option as a model of operations as it will ensure constant adjustments to environmental changes. This theory explains of the main key issues in this research objective such as AMCOS interaction with external environment including climate change and a little bit of operational models and member participations. The study was guided by null

hypothesis that each of predicted determinant has no significant influence on operational sustainability of AMCOS.

METHODOLOGY

This study adopted cross sectional research design and hence data were collected at one point in a time from more than one AMCOS. The research used both qualitative and quantitative data. The research was conducted in Kilimanjaro region. The region was selected purposively because it possesses AMCOS that have been operating in entrepreneurial model and other traditional model. Those AMCOS can gave out the required sample size combination for measuring the operational sustainability. This study targeted co-operative members and board members of cooperatives in primary AMCOS in Kilimanjaro region. There were a total of 119 AMCOS in Kilimanjaro region. For the purpose of this research co-operative members including the co-operative leaders (board members) were included in the sample. The sample size was determined using the formula developed by Cochran (1977) for unknown population; number of population of members in Kilimanjaro was not exactly known for study AMCOS since there is recruitment and retirement of members throughout the time. According to Charan (2013), for sample size calculation of unknown population size, you can use the following formula: $n = z^2 \cdot [p \cdot q] / d^2$, which is used to calculate the sample size of cross-sectional studies. In this formula, n is the sample size, P is the estimated proportion of the study variable or construct based on previous studies or pilot studies (70%), $q = 1 - P$ (30%), and d is the margin of error (5%). z is the Z-score or a standard normal deviate corresponding to (100%, $\alpha/2\%$), where α refers to the significance level or the probability of making a type I error. The z

score for different significance levels is: 1.96 for 5%, 1.28 for 10%, and 2.58 for 1%. He have added some hypothetical values and the sample size obtained to was 323. Basing on this the sample size n of this research obtained using the following equation

$$n = \frac{Z^2 pq}{e^2}$$

Where n is the sample size, Z^2 is standard normal deviate, set at 1.96 approximately 2.0 Which is equal to the desired confidence level of 95% selected for this study, p is the estimated proportion of an attribute that is present in the population (as it is not known 50% will be used), q is $1-p$, and e is the desired level of precision or margin of error which is set at 0.5

$$n = \frac{1.96^2 \times 0.5 \times 0.5}{0.05^2} = 384.16 = 400$$

Respondents were selected from 8 co-operatives in Kilimanjaro region, 4 from poorly operational sustainability and 4 from actively operational sustainability primary AMCOS. In selecting the number of members from each AMCOS, considering the Co-operative Societies Act 2013 section 20(1) a primary society may be formed by (a)

Table1: Sample size distribution

Name of AMCOS	Number of co-operative members	Number of board members
Masama Mula	45	5
Machame Nkuu	45	5
Mwika North	45	5
Manushi Sinda	45	5
Mwika Kinyamvuo	45	5
Kirua Vunjo West	45	5
Mwika South	45	5
Kirua Vunjo North	45	5
Total	360	40

Selection of sample co-operatives: The Table 2 developed as criteria for selection of sample space. The sample space included four poorly performing in sustainability co-operatives and four sustainably performing co-operatives to measure the differences in performance. Selection of sample co-

twenty to thirty persons for agriculture societies. The researchers took 50 members (45 members and 5 board members) from each primary AMCOS to ensure inclusion of enough co-operative members for questionnaires. A sub-sample size of 30 respondents is the minimum for studies in which statistical data analysis can be done (Kitala 2014; Bailey (2009). Therefore, 400 respondents were selected from AMCOS in Kilimanjaro as shown in Table 1.

Respondents selected from 8 co-operatives in Kilimanjaro region, 4 from poorly operating and 4 from actively operating co-operatives. In selecting the number of members from each AMCOS, considering the Co-operative Societies Act 2013 section 20(1) a primary society may be formed by (a) twenty to thirty persons for agriculture societies. The researchers took up maximum of 50 respondents (45 members and 5 board members) from each AMCOS as respondents as shown in Table 1 to ensure inclusion of enough co-operative members as respondents of questionnaires of this study.

operatives was made with regards to the below criteria to ensure the most representative sample. After developing the criteria, the researchers communicated with district co-operative officers to get list of co-operatives based on the criteria

Table 2: Sample size selection criteria's

SN	AMCOS success characteristics	Criteria for success
1.	Engagement in processing and value addition	Value addition activities
2.	Enough revenue enables AMCOS to meet working capital	Revenue greater than costs
3.	Number of active members	45 or more
4.	Number of services offered by AMCOS	2 or more
5.	AMCOS entrepreneurial characteristics	Value edition activities

Sampling Strategies: Sampling procedure involved stratified sampling and purposeful sampling consecutively. Stratified sampling was applicable in dividing the groups of poorly performing cooperatives and actively successfully performing co-operatives into two. The information about these co-operatives is obtained from the key informant such as co-operative officers in Kilimanjaro region. After dividing the strata, purposeful sampling method was applied intentionally to obtain a sample which can enable to give a picture in relation to study objective. However, a criterion for selection of sample was developed to get the representative respondents. This included; number of years in AMCOS (at least 10 years), finishing paying shares, active participation in meetings, understanding of co-operative business and co-operative business as one of main income sources. In selecting the respondents, the researchers cooperated with leaders of AMCOS and Chief executive officers of AMCOS to access the researchers with the members' register book in order to get profile of each member and therefore those characteristics. After a number of them being obtained the researchers used lottery method to randomly select respondents. In data collection, informal interview was conducted to key informants such a way that the collected information was recorded in diary and used to guide the researchers in sampling of AMCOS while primary data were collected from respondents (members and board members of AMCOS by

administering questionnaires. analysis of data was conducted by using Statistical Package for Social Science (SPSS). The inferential data were analyzed using multiple linear regression model. Dependent variable stands as sustainability of AMCOS and the independent variables are co-operative models, influence of member participation and changes in business environment. According to Kothari (2009), when there are two or more than two independent variables, the analysis concerning relationship is known as multiple regressions and the equation describing such relationship as the multiple regression equation as shown in the equation (1). Regression Coefficients were used to measure sustainability in this study.

$$y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e \dots \dots \dots (1)$$

Where:

y= dependent variable (sustainability of AMCOS)

β_0 = Value of dependent variable (y) when all other parameters are set to 0(y-intercept)

$\beta_1 X_1$, and $\beta_2 X_2$, $\beta_3 X_3$ = Regression coefficient of the independent variables, where by

$\beta_1 X_1$ = Regression coefficient of the first independent variable (co-operative model)

$\beta_2 X_2$ = Regression coefficient of the second independent variable (member participation)

$\beta_3 X_3$ = Regression coefficient of the fourth independent variable (business environment)

e =Model error (how much variation is in the estimate of the dependent variable y)

FINDINGS AND DISCUSSIONS

Overview: This section presents a discussion of the findings for the three objectives of the research from the survey of the questionnaires. The respondents were interviewed by the use of a questionnaire and the co-operative owners of AMCOS (members and board members) were the unit of analysis. These were members of primary AMCOS in the surveyed areas. Also, this section presents the findings of the objective of this study which were about the models of co-operative operations effect on operational sustainability in AMCOS, the contribution of member participation in co-operative activities on improving operational sustainability of co-operatives in Tanzania, and the effects of changes in business environment in the operational sustainability of AMCOS. This section presents findings both descriptive statistics and inferential statistics .is divided in two main parts. The descriptive statistics of the sample

characteristics and the study variables such as mean, standard deviation, frequency, percentage were analyzed and presented while inferential analyses present regression analysis output such as regression coefficient and p values that provide the results of the relationship of the extent of independent variables on dependent variable and testing the study hypothesis to enable conclusion of this article.

Questionnaires Return Rate: The respondents of this study were members of agriculture marketing cooperative societies in Kilimanjaro region. A total of 400 questionnaires were distributed, and 288 questionnaires were collected back having filled completely. According to Mugenda and Mugenda (2003), a response rate of 50 percent is adequate for data analysis and reporting; a rate of 60 percent is good and rate of 70 percent and overall is excellent. This entail that an approximate of 72 percent for this study (see Table 3) was suitable for data analysis and reporting

Table 3: Questionnaires Return Rate

Co-operatives	frequency	Percent
Masama mula AMCOS	42	10.5%
Machame nkuu AMCOS	38	9.5%
Mwika north east	32	8%
Manushi sinde AMCOS	34	8.5%
Mwika kinyamvuo AMCOS	36	9%
Kirua vunjo west	40	10%
Mwika south rcs ltd	34	8.5%
Kirua vunjo north	32	8%
Total	288	72.00%

Sources: Survey Data (2021)

A total of eight co-operatives were involved in collection of data, and a huge percent The three independent variables results were first analyzed and presented and finally the combined effect results of those variables were presented. The presentation of findings flow as firstly, Influence of cooperative models (X_1), secondly member participation (X_2), thirdly business environment (X_3) and finally the results of combined influence of

the three variables to sustainability of AMCOS as relationship analysis.

Influence of co-operative models on operational sustainability of AMCOS in Kilimanjaro region: The first variable assessed was AMCOS operational models. Under this objective descriptive analysis, ANOVA and regression were performed. The result depicted that 180 (62.5%) of the respondents selected traditional model as the

model of operation while the remain 108(37.5%) depicted Entrepreneurial model. This shows respondents by the majority uses traditional model on their operations.

Comparative analysis for the operational models: The study furthermore performed a comparative analysis on traditional model and Entrepreneurial model on sustainability of AMCOS. The study used One-way ANOVA to compare the performance of the two models (Traditional model,

entrepreneurial model) Result presented on Table 4 showed that $p\text{ value} = 0.005 < 0.05$. It supports that there is the significance difference between traditional operational and entrepreneurial model on the sustainability of the AMCOS. The result presented on Table 4 shows that, the cooperative operates under traditional approach and under modern approach they do perform in reaching the sustainability.

Table 4: ANOVA AMCOS sustainability

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	137.363	1	137.363	236.875	.000
Within Groups	160.051	276	.580		
Total	297.414	277			

Sources: Survey Data (2021)

Performance measures of the selected AMCOS operational models: The study was however interested in determining which model has a good contribution over the AMCOS sustainability. Linear regression was adopted to measure the relationship whereby the outcome of the analysis which includes the sum of squares, degree of freedom (df),

mean square, regression and residual values obtained from regression analysis. The interested value in the ANOVA Table was the P-value that exemplifies an indication of whether the model is significant or insignificant where to be significant the P-value must be ($p < 0.05$).

Table 5: ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	340.398	2	170.199	35.332	.000 ^b
	Residual	1372.879	285	4.817		
	Total	1713.278	287			
a. Dependent Variable: Sustainability						
Predictors: (Constant), Entrepreneurial, Traditional						

Source: Survey Data (2021)

From Table 5, the regression mean square was 170. 199. The F-statistic was 35.562 which illustrate the overall significant of the model. Degree of freedom (df), was 2.00. Statistically, the overall model/relationship was significant with significant value P-value =0.000, whereas ($p < 0.05$). For this result, it worthy concluding the regression model fit of the data where the predictors had a significant contribution in the AMCOS sustainability.

Regression coefficient: Another output when running regression analysis is the regression coefficient. Table 6 that provides the values of regression equation for predicting dependent variable from the independent variables. From Table 6 of the regression coefficient below, the estimated coefficients (standardized coefficient) depicted by beta value indicate how much the “Scores” varies due to variation of any

independent variable while holding other independent variables (predictors) constant.

Table 6: Coefficients ^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.225	1.463		2.204	.028
	Entrepreneurial	.356	.043	.444	8.370	.000
	Traditional	.047	.054	.047	.882	.379

a. Dependent Variable: Sustainability

Sources: Survey Data (2021)

From Table 6, it is indicated that every unit change of entrepreneurial model influence positively the sustainability by (0.444), while traditional model positively influences sustainability of the AMCOS by (0.047). In this regard entrepreneurial model had a highest (44%) influence on the sustainability of the AMCOS in Kilimanjaro with significant values ($p < 0.000$). it is worthwhile concludes that AMCOS operate under entrepreneurial approach perform better than those under traditional approach. Influence of member participation in co-operative activities on operational sustainability of AMCOS in Kilimanjaro region: The second variable analysed was influence of member participation in co-operative activities on operational sustainability of AMCOS in Kilimanjaro region. The findings in Table 7

depicted that the most of member participation approaches used were involvement in the decision making, followed by meeting. The finding showed that members involved in the decision making had (mean =3.3785, Std. dev =1.18314) with the lead score followed by meetings run with (Mean =3.2153, Std. dev 1.3260), then election participations with (Mean =3.14, Std.dev =1.363), followed by member participating in selling their products with (Mean =3.215, Std.dev =1.326). However, members paying cooperative fees had (Mean =2.95, Std.dev =1.4034) and members paying voluntary contributions with (Mean = 2.64, Std.dev =1.081) while member participates in influencing selling prices constitute the least practice in supplier integration.

Table 7: Descriptive statistics

	N	Mean	Std. Deviation
AMCOS members attend in the meetings	288	3.1458	1.42143
AMCOS members are participating in elections	288	3.1458	1.36389
AMCOS members are selling their produce through the AMCOS	288	3.2153	1.32604
AMCOS members participate in influencing selling price	288	2.1771	.59606
AMCOS members are paying co-operative fees	288	2.9514	1.40348
Members are engaged in AMCOS activities	288	2.9028	1.16164
Members are paying voluntary contributions to the AMCOS	288	2.6458	1.08180
AMCOS members are involved in decision making	288	3.3785	1.18314
Valid N (listwise)	288		

Sources: Survey Data (2021)

According to Kilangi (2012), a mean score below 2.5 denoting the low level of agreement while a mean score of 2.5 to 3.4 denoting moderately agreed and a mean score above 3.4 highly agreed. Mean score 0 to 2.5 denoting those respondents did not agree upon the given statements, 2.6 to 3.4 denoting those respondents moderately agreed upon the given statements and 3.5 to 5.0 denoting those respondents highly agreed upon the given statements. Members in AMCOS are the principal owners, whereby ownership is governed by a democratic process of managing their co-operatives as defined in the co-operative policy Act and by-laws. Members has some positive views on how decisions are made in their AMCOS and revealed to have control of decision-making process, democracy is observed and they somehow get feedback on implementation of previous decisions. Also, participation of members in decision making in the co-operatives helps to create strong organizations that can help to address their socio-economic problems. Also, members need to have control of decisions in process of interacting with external stakeholders e.g., in pricing commodities, inputs supply, joint investments and other affairs (Maghimbi, 2010, Rwekaza and Anania 2020). This is to say, attaining active participation of members, there is a need to promote their voice in decision making of various co-

operative affairs as argued by Rwekaza and Anania, 2018). Another member participation factor with the high mean score is member sales through the co-operative. It is true that survival of AMCOS is attained when the co-operative business as a common bond, successful sustainability of a co-operative highly depends on success of a co-operative business that is for these case co-operative member sales. Co-operative members ranked high the attendance to the meeting as a member participation factor contributing to sustainability of AMCOS. Attending to the meetings is literally helpful in ensuring member participation in co-operative activities on decision making in a co-operative, AMCOS.

Changes in business environment on operational sustainability of AMCOS in Kilimanjaro region: The third variable which was assessed was the influence of Changes in business environment on operational sustainability of AMCOS in Kilimanjaro region. The finding from Table 8 showed change in economic environment (Price) was the leading environment with a mean (mean =4.052, Std. dev =0.835) followed by technology environment with (Mean =2.885, Std. dev 1.1911), then political environment (government policy) with (Mean =2.409, Std.dev =0.8117), followed by marketing environment (Mean =2.11, Std.dev =0.937).

Table 8: Descriptive statistics

	N	Mean	Std. Deviation
As a member of the AMCOS, you get marketing information on time	288	2.7986	1.14508
The AMCOS being affected by changes in the marketing environment	288	2.1111	.93787
The AMCOS product being challenged in the market by other organizations of the same product – competition	288	2.0347	1.07174
Changes in government policies, rules and regulation effect on the performance of your AMCOS	288	2.4097	.81718
Your co-operative adopts measures to cope with the changes in farming technology	288	2.8854	1.19117
Changes in price affect your business operations	288	4.0521	.83524
Valid N (listwise)	288		

Sources: Survey Data (2021)

The study findings indicated that changes in price highly affected co-operative sustainability. Free market challenge (Competition) Market liberalization, just as to other local enterprises, has affected the co-operative societies mostly in terms of price instability and competition. The results accord to that of Anania and Rwekaza (2018) whose study focused on the benefits and challenges of agricultural marketing co-operatives in Moshi district. Accordingly, price fluctuation in the local and foreign markets is a challenge facing the co-operatives and discouraged production. As a result, some members diversify into growing more food crops, keeping livestock and/or engage in small businesses. Low prices bring little profit (and sometime losses) to members as it cannot effectively cover the costs of production like preparing the farms, labour work applied, harvesting and transport expenses and access to farm inputs (like fertilizers, agrochemicals and storage facilities. Also, members' incomes found to be largely affected by such price instabilities as they find themselves only covering production cost with little surplus remained. The prices also fall due to low quality of their produce. The findings also related to that of Sambuo (2017) on assessment of sustainability of AMCOS in coffee producing areas of Rombo and Mbozi by looking at the pricing mechanisms used and how these affects the sustainability of AMCOS in these areas. According to his results, the challenge of change in price of coffee as well as sustainability of agricultural marketing cooperatives in Tanzania has serious implication to farmers and AMCOS dealing with production and marketing of coffee respectively. His study indicated that coffee fluctuation was influenced by external factors such as market speculation for traders, weather conditions and climate change in countries of large scale production like Columbia, also unstable exchange rate of US dollar against Tanzania currency. These challenges necessitate improvement in performance of AMCOS to cope with such

external business challenges to ensure survival and sustainability in the market within climate change environment. This study suggests that, AMCOS like any other business organization has to adapt to external environment challenges and changes by coming up with the better ways of performing their business operations. AMCOS has to be competitive enough to conquer external shocks and stress. For the case of coffee AMCOS this might include improving quality and quantity of coffee, also by engagement in value additions. AMCOS that had some element of engagement in value addition therefore considered entrepreneurial also shows some elements of competitiveness unlike the purely traditional co-operatives that only involved themselves in marketing of coffee. Mather and Preston, (1990) study indicated that the situations from Mweka Sungu, Mruwia and Uru North Njari co-operatives have indicated that these co-operatives are facing the challenge of competition from other large coffee producers. This creates a big challenge for the co-operatives to ensure they are maintaining quality and producing large quantities of coffee. Furthermore, the presence of private buyers is affecting volume of sales of coffee through co-operatives as the members sometimes decide to sell all or part of their coffee to individual private buyers and organizations. The private buyers sometimes offer better prices (slightly) above the indicative buying prices offered by co-operative societies. This causes loss of revenues (primary society levies) by the co-operative societies. Not all co-operatives acquire the leadership and financial abilities to deal effectively with other firms in the marketplace. Many agricultural co-operatives have little or no influence on the basic price level for the farm products or supply of items. Despite the fact that internal factors that lead to persistently low prices are; poor quality and unbranded coffee with no patent rights, a number of taxes and levies, high local transport cost, coffee shrinkage percent, primary cooperatives depending on unions to

set price and some of the coffee being stolen/misplacement during weighting, the auction monopoly opt to offer any price to coffee farmers regardless of the good quality coffee. Tanzania Cotton Board has no mandate to set price offered by exporters to Primary AMCOS for given quality coffee products, but at worst scenario of low prices they may intervene and adjourn the auctioning pending price rise (TCB, 2012). Relationship analysis: To determine the relationship between the variables linear regression model was adopted as the main

model for this study as provided in equation (1). The model was adopted due to the nature of the variables used in this study. The regression analysis was conducted to determine the statistical relationship between the predictors and the dependent variable. Since there were three independent variables and one dependent variable.

Model Summary: Table 9 resents the model summary which demonstrate the relationship between independent variables and the dependent variables

Table 9: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.661 ^a	.437	.431	1.84322

a. Predictors: (Constant), Member participations, models, business environment

Sources: Survey Data (2021)

From the above findings, the correlation coefficient (R) which measures the relationship between the independent variables and the dependent was 0.66 or 66% which indicates stronger relationship between the two. On the other hand, the R-squared was 0.437 illustrating that the chosen predictors explain the dependent variable by 43.7%. This implies on the other hand 56.3% of non-explained predictors is accounted by factors that are not used in this model.

Analysis of Variance (ANOVA): Analysis of variance was carried out as shown on Table 9; the outcome of the analysis includes the sum of squares, degree of freedom (df), mean square, regression and residual values obtained from regression analysis. The interested values in the ANOVA Table were the P-value that exemplifies an indication of whether the model is significant or insignificant where to be significant the P-value must be ($p < 0.05$).

Table 10: ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	748.396	3	249.465	73.427	.000 ^b
	Residual	964.882	284	3.397		
	Total	1713.278	287			

a. Dependent Variable: Sustainability

b. Predictors: (Constant), Member participations, models, business environments

Sources: Survey Data (2021)

From Table 10, the regression mean square was 249.465. The F-static which is computed by regression mean square divided by residual mean square was 73.427 which illustrate the overall significant of the model. Degree of freedom (df), was 3.00.

Statistically the overall model was very significant with significant value P-value =0.000. Where, ($p < 0.05$). For this result it worthy concluding the regression model fit the data where, the predictors had an influence on the sustainability of AMCOS.

Regression Coefficients: Another output when running regression analysis is the regression coefficient. Table 10 provides the values of regression coefficient for predicting dependent variable from the independent variables. From Table 10 of the regression

coefficient, the estimated coefficients (standardized coefficient) depicted by beta value indicated how much the “Scores” varies due to variation of any independent variable while holding other independent variables (predictors) constant.

Table 11: Coefficients ^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-2.528	1.227		-2.060	.040
	Co-operative Models	.076	.031	.120	2.447	.015
	Change in business environment	.412	.044	.486	9.293	.000
	Member participations	.143	.037	.196	3.847	.000

a. Dependent Variable: Sustainability

Sources: Survey Data (2021)

Table 11 indicate that every unit change of the operation models influence positively the sustainability of AMCOS by (0.120), while business changes influence the sustainability of AMCOS by (0.486) and lastly Member’s participations influence the sustainability of the AMCOS by (0.196). In this regard all variables had significant contribution on the sustainability of the AMCOS with significant values ($p < 0.015$), ($p < 0.000$) and ($p < 0.000$) for the operational models, business change and member’s participation respectively. The study was guided by null hypothesis that each of predicted determinant has no significant influence on operational sustainability of AMCOS. This hypothesis was rejected because all variables have significant contribution to operational sustainability of AMCOS in Kilimanjaro, Tanzania. Therefore, it is worthwhile saying that business environment had a higher contribution on AMCOS sustainability by 48.6% followed by member participations by 19.6% while business operation model had a 12% of the contribution. Business environment has proven to be the most influential factor to sustainability of business.

Literally, Businesses do not operate in a vacuum but rather in a dynamic environment that has a direct influence on how they operate and whether they will achieve their objectives. The internal environment can be controlled by managers and workers but the external environment has to be adopted day to day as it is less controllable. The growing competition in the world market requires continuous adjustments of the business operations to adjust to the changes in the business environment.

CONCLUSION, RECOMMENDATIONS AND FURTHER RESEARCH

On the influence of co-operative models on operational sustainability of AMCOS, the research findings conclude that entrepreneurial model has more influence on sustainability than the traditional model. However, few primary AMCOSs that have started to shift their efforts to entrepreneurial model. Also, the AMCOS that has started to shift their efforts to entrepreneurial; they are doing so in a very small extent. On the influence of member participation in co-operative activities on operational sustainability of AMCOS, the study findings

conclude that member participation has significant impact on operational sustainability of a co-operative business. Among member participation factors, decision making and meeting participation has been the leading factors influencing sustainability of co-operative business. Finally, it was concluded that business environment is the leading determinant of operational sustainability of AMCOS, the influence of external environment changes has a huge impact on operations of AMCOS. Among the main issues in the business environment that affect AMCOS operations and sustainability is changes in price. The paper findings conclude that changes in price affects business operations, members' perception and the willingness of members to participate in co-operative business, particularly the case of price increase. Advancement if technology is another factor highly impacting the cooperative business sustainability given the climate change conditions in the coffee production areas. It has been observed that co-operatives are hardly adopting to the changes in technology for example quality of seeds used (organic coffee currently highly preferred) and coffee quality during processing; some co-operatives are still using local processing facilities. With respect to all other issues, this affects competitive power of AMCOS produce in the world market. Basing on the conclusions the recommendations are going hand to with the theory of resource dependency theory. The resource dependency as the dominant theory in the addressing sustainability of AMCOS, the paper information to the theory while make recommendations. The stakeholders of co-operatives such as members, board members, management, cooperative movement, government officials such as co-operative

commission, coo-operative officers, co-operative training institutions such as Moshi Co-operative University, private organization and donor community and so on to work towards enhancing the operational sustainability of AMCOS. Their program planning should be to allocate resources first to enhance business environment until when a resource becomes constraint, then second to allocate resources to enhance member entrepreneurial models until when a resource becomes constraint. This approach will bring more operational sustainability of AMCOS in Kilimanjaro region and Tanzania at large.

Further research can be conducted on "Success of primary AMCOSs to shift traditional model to entrepreneurial model" or "Factors influencing the primary AMCOS to shift their operations to entrepreneurial model".

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