Extension Service Delivery following Marketing Approach for Maize Productivity in Morogoro and Dodoma Regions

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ABSTRACT

Agricultural extension service is one of the strategies specified in the Agricultural Sector Development Strategy *(ASDS) I and II for successful productivity of Agricultural sector in Tanzania. The ASDS I and II emphasize on delivering extension services to farmers using marketing approach. The extent to which extension service are provided to farmers using marketing approach is not yet scholarly established. This study therefore evaluates the extent to which extension services are delivered to maize farmers following marketing approached-based skills in Morogoro and Dodoma Region. The study also determines the influence of marketing approached-based skills on maize productivity.* The study quantitatively employed descriptive and explanatory survey designs. The data were gathered using questionnaire from 500 farmers who were sampled through stratified simple random technique. The gathered data were analysed using Descriptive Statistics and Multiple Linear Regressions. that the findings revealed that, extension services are delivered to maize farmers to some extent using marketing approach-based skills; but to a large extent the services are delivered on pure agricultural skills. Furthermore, the marketing approach-based skills were found to have positive and significant influence on maize productivity. It is therefore recommended that, the government and other stakeholders through their respective extension agents should emphatically provide pure agricultural skills in conjunction with marketing approach-based skills to maize farmers.

Key Words: Marketing Approach, Productivity, Extension Service

1. INTRODUCTION

Agricultural extension service is one of the drivers and interventions specified in the Agricultural Sector Development Strategy *(ASDS) I and II for successful growth and productivity of the Agricultural sector in Tanzania (ASD, 2015/2016-2024/2025).* The importance of agricultural extension services in the country's development is extensively accredited as one of the drivers and prerequisites for successful agricultural production and productivity (Masanyiwa, et al., 2019). agricultural extension services simply the transfer of knowledge, skills and best practices to farmers for high production and productivity (Sanga, et al., 2013).

Due to its importance, agricultural extension services have attracted extensive research in Tanzania. For example, Sanga, et al. (2013) assessed the effectiveness of an impact-driven, radio-based extension service delivery system, which was introduced in some rural areas of Tanzania and found that some farmers have begun sharing agricultural information and have changed to best practices. elsewhere, Wambura, et al. (2015) studied extension systems in Tanzania and identified research gaps in such areas as the use of technology for extension services, privatization of extension services, decentralization of extension services, and extension services for commercialized agriculture particularly in marketing.

Masanyiwa, et al. (2019) investigated the impact of decentralization by devolution on farmers' access to agricultural extension services in the selected villages in Dodoma. The findings revealed that, implementation of decentralization facilitated farmers access to several types of extension services in Dodoma. In another study, Shausi, et al. (2019) assessed crop farmers' willingness to pay for agricultural extension services (AESs) and identified factors influencing their willingness to pay for AESs. The findings revealed that, education level, age, experience in farming, distance from the significant roads, income level and attitude towards AESs have influenced 92percent of the farmers to be willing to pay for AESs .

Abed, et al. (2020) estimated farmer's willingness to pay (WTP) for four types of agricultural extension services (AES) in the cereals' value chains as part of two United States Agency for International Development (USAID)-funded Feed the Future initiatives in Tanzania. The study indicated that, the average figures that farmers are WTP ranged from 20,000 to 24,000 TZS (8–10 USD) depending on the type of AES and in accordance to socioeconomic and agriculture-related

variables such as sex, age, household size, land ownership, agricultural revenues, off-farm income, location, and access to technology. Ortiz-Crespo, et al. (2020) investigated the user-centred design of a digital advisory service for enhancing public agricultural extension for sustainable intensification in Tanzania. The study revealed that, a mobile advisory service "Ushauri," which is created through a user-centred design process, can help to address communication and information challenges of Sustainable Intensification and effectiveness of extension services.

With reference to the above studies, the *ASDS I and II prioritized* agricultural extension service as one of the drivers and interventions specified in the strategy *for successful growth and productivity of the agricultural sector in Tanzania. Specifically, the emphasis is on commercialized agriculture through having specialized extension agents for marketing approach in the agriculture sector. According to the ASDS I and II,* specialized extension agents for marketing approach are significant in advising farmers on business skills (business planning, market survey, negotiations, etc.) and market demand (production volume, timing, quality, etc.). Additionally, commercialized agriculture is advocated in KILIMO KWANZA resolution whose initiatives such as agricultural commoditization, implementation of incentives are meant to ensure competitiveness and address market barriers, price stabilization mechanisms, industrialization and infrastructure development (United Republic of Tanzania [URT], 2010b).

Commercialized agriculture is based on production for the market and aimed at profit making and introduction of products, services, and technologies to the market for purchase (FAO, 2015; USAID, 2017). Commercialized agriculture enables farmers to have access to transformational innovations and to do away with subsistence farming. commercialized agriculture following marketing approach plays a central role in addressing what customers want and supplying to them accordingly for profit, saving costs of exchange of agro-produce, guaranteeing adequacy and stability of food supply in ways that reward farmers, agro-traders and consumers (Chami, 2020).

Despite the significance of commercialized agriculture to the wellbeing of farmers and the country's' economy as a whole, major challenges are still registered in the agricultural markets hampering commercialization of subsistence agriculture (FAO, 2015). Some of these challenges include poor infrastructure, inadequate support services and weak institutions, increasing transaction costs and volatility of prices (FAO, 2015; Chami, 2020). It must be noted that, *specialized extension*

agents for marketing and vale chain approach in the agricultural sector is one of the inadequate support services is one of the identified challenges. It is established that, agriculture in Sub-Saharan Africa has historically been challenged by isolation from the markets and lack of institutional support (FAO, 2015). The majority of farmers in Tanzania lack access to commercial markets, business and market orientation (Mutabazi, et al., 2010; Rwehumbiza, 2014). There is noted lack of support and expertise in agricultural product marketing and promotion, and poor access to markets among farmers due to lack of networking with other farming groups and weak relations with local government and other local NGOs (FAO, 2018).

Advocacy on *commercialized agriculture through specialized extension agents for marketing approach in the agricultural sector was expected to be prioritized in the previous studies. However, several previous studies (e.g.,* Masanyiwa et al., 2019; Shausi et al., 2019; Abed et al., 2020; Ortiz-Crespo, et al., 2020) have paid little attention to *specialized extension agents for marketing approach in the agricultural sector. The cited studies have mainly focused on extension agents for advising farmers on improved seeds, pesticides, fungicides, implements, and farming techniques and little was done regarding advice on marketing approach.*

Maize is one of the crops that require extensive service based on marketing approach. maize is the major staple crop grown by the majority of smallholder farmers in Tanzania (Global Agriculture and Food Security Program [GAFSP], 2016; Chami, 2020). Maize is also one of the most important food crops in Tanzania accounting for nearly 20percent of agricultural GDP, 30percent of overall food production and 40 percent of the total calories consumed (GAFSP, 2016). *maize yields have remained stagnant while its demand and importance for guaranteeing food security have increased.* Maize yields in Tanzania has been low in spite of its significance to the country's food security and economic well-being of farmers *and* the commendable efforts made by the government in recruiting many extension agents in the country *(*FAOSTAT, 2020). Hence, new approaches to extension and advisory service delivery are needed in order to stimulate increased maize production (Wambura, et al., 2015)

This study therefore intended to assess the extent to which extension service are delivered to farmers following marketing approach. Specifically, the study aimed at examining the extent to which maize farmers are advised by the extension agents on marketing approach-based skills, and the influence of marketing approach-based skills on maize productivity.

2.0 METHODOLOGY

The study adopted cross-sectional strategy whereby data were collected from different farmers at a single point in time as from August, 2019 to March, 2020. The data were collected from *Morogoro and Dodoma regions in Tanzania*. *According to the URT (2012), the regions face* continuous food shortages despite greater potential for food production and agricultural development as a whole. This study adopted model by Wambura, et al. (2015) on maize extension and advisory services in the given regions which is focused on agricultural marketing approach. Four wards from each district (Mvomero, Kilosa, Kondoa and Kongwa) in the two regions were surveyed in data collection.

This study used stratified simple random sampling, which aided in classifying the population of farmers as from 2015/2016 into a stratum of their characteristics (original district). The technique also provided an equal chance for each farmer of being selected from the stratum specified. The study had the sample size of 500 farmers, whose selection criteria. include the size of the population as whole, saturation point, and nature of data analysis. However, this study obtained its sample size based on the nature of data analysis, notably Multiple Linear Regression (MLR).

The sample size was calculated using the nature of data analysis due to lack of exact figure of maize farmers from the regional authorities. a quick scientific optional way was to obtain the sample size using the nature of data analysis. The sample size requirements for MLR is calculated using the formula "N > 50 + 8m (where m = number of predictors" by Tabachnick and Fidell (2001, p. 117). After calculation, it was noted that, the study has not violated the sample size assumption that is N>50+8 (2) = 66. This study has a maximum of two predictors and 500 cases which are more than 74 obtained from the given formula. However, 425 questionnaires were found complete and useful for the data analysis that means the response rate was 85 percent.

Table 1: Proposed and Field Obtained Sample Size

Surveyed Districts	Proposed Sample Size		Obtained Sample Size	
	Farmers Number	Farmers Percentage	Farmers Number	Farmers Percentage
Mvomero	139	28.0	116	27.0
Kilosa	131	26.0	103	25.0
Kondoa	107	21.0	99	23.0
Kongwa	123	25.0	107	25.0
Total	**500**	**100.0**	**425**	**100.0**

The study essentially used primary data, which were collected using questionnaires. Because data were collected from 500 farmers in sixteen different wards in different districts, the questionnaire became relatively cheap, quick and efficient in obtaining large amounts of information from that large sample of farmers. The questionnaire had closed-ended questions with multiple choice answer-options, which simplified their analysis which was done using descriptive statistics and Multiple Linear Regression.

The collected data of this study were analysed using descriptive statistics and Multiple Linear Regression. The Descriptive Statistics was used to analyse the respondents' personal information, variables for any assumption violation, and to address specific objective number one. Multiple Linear Regression was used to analyse specific objective two in testing and establishing relationship between a business and market demand skills and maize productivity. The two specific objectives had more than one predictor and one dependent continuous variable as follows,

Objective Two:

$$Y=\alpha+\beta_1\chi_1+\beta_2\chi_2+\varepsilon$$

Where:

Y*-Criterion (i.e. Maize Productivity)*
α*-constant (intercept)*
β $_{1\text{-}2}$***-****Regression Coefficients*
χ $_{1\text{-}2}$***-****Predictors (i.e. Marketing Approached-based Skills which Business Skills, Market Demand Skills)*
ε- Margin error

This study has major variables such as marketing approach-based skills, pure agricultural approach-based skills and maize productivity. Marketing approach-based skill is a non-continuous variable using ten items (i.e., marketing planning, market survey, marketing negotiations, market networking, honey promotion, production volume for the market, production timing for the market, production quality for the market, and supply to customers for profit, and saving costs of exchange in the market). The items are drawn from previous studies (ASD, 2015/2016-2024/2025; FAO, 2015; USAID, 2017). The 5-point Likert-type scale ranging from 1 (a very small extent) to 5 (a very large extent) was used to measure the items of marketing approach-based skills.

Pure agricultural approach-based skill is a non-continuous variable using five items (i.e., improved seeds, improved pesticides, improved fungicides, improved implements, and using improved farming techniques). The items are drawn from the previous studies (ASD, 2015/2016-2024/2025; FAO, 2015; USAID, 2017). The 5-point Likert-type scale ranging from 1 (To a very small extent) to 5 (To a very large extent) was used to measure the items of pure agricultural approach-based skills.

Maize productivity is a continuous variable measured using the number of tons produced per hectare taken from the previous study (Kizito, 2015). The number of tons were grouped in the scale of 1-5 (i.e., 1. below 1.7 tons per hectare; 2. 1.7 tons per hectare; 3. 3.5 tons per hectare; 4. 4.0 tons per hectare; and 5. Above 4 tons per hectare).

3.0. FINDINGS

3.1 Personal Information of the Surveyed Farmers

The results in **Table 3** indicate that, majority of the surveyed farmers were males. This implies that, more male farmers are engaged in maize production as opposed to females. Although female farmers play a significant role in maize production activities, most of the households are dominated and headed by male farmers. These results are supported by what was previously found by Wambura, et al. (2015); Masanyiwa, et al. (2019); Shausi, et al. (2019) who noted that, more than half of the surveyed farmers were males when evaluating accessibility of extension services by farmers in Dodoma region.

Furthermore, the majority of the surveyed farmers were between 40-44 years of age. maize production in the surveyed regions was mainly carried out by middle and productive ages although minimal difference between ages is noted. These findings are consistent with the findings reported in a study by Masanyiwa, et al. (2019) who revealed that, two thirds (66%) of the farmers were between 36 and 45 years of age while Shausi, et al. (2019) noted that about 70 percent of the respondents were between 39 and 49 years of age.

Marital status was one part of personal information assessed among the surveyed farmers in the study area. The results in **Table 3** demonstrate that, the majority of the farmers surveyed in the regions were married. maize production is majorly done by married farmers as opposed to other groups of farmers. In another study, Shausi, et al. (2019) revealed that, the majority (68.4%) of the surveyed farmers were married as compared to other groups.

The lowest education level considered in the current study is no formal education while the highest level is postgraduate education. The results in **Table 3** indicate that, the majority of the surveyed farmers had primary education. This implies that, most of them had no marketing approach-based skills as these are not taught in primary schools. The acquisition of skills could highly depend on extensive agents and other sources. Similar findings are reported by Shausi, et al. (2019) that, the majority (84.2%) of the surveyed farmers in Mpwapwa and Mvomero districts had primary education.

Because this study was carried out in four districts in the surveyed regions, the surveyed farmers had to identify specific district they lived and worked. The majority of the surveyed farmers were living/working in Mvomero though the difference in the number of farmers living Mvomero and those living in other districts was insignificant. These results imply that, there are farmers who engage in maize production in the given districts although they do not live in the locality. In another study, Masanyiwa, et al. (2019) revealed that 94 percent of the surveyed farmers lived in the respective villages which were original birth places.

Table 3: Personal Information of the Farmers

FARMERS' INFORMATION			
Personal Information	**Scale**	**Frequency**	**Percent**
Sex	1. Male	291	68.0
	2. Female	134	32.0
	Total	**425**	**100.0**
Age	1. 29 and below years	61	14.0
	2. 30-34 years	80	19.0
	3. 35-39 years	91	21.0
	4. 40-44 years	100	24.0
	5. 45 and above years	93	22.0
	Total	**425**	**100.0**
Marital Status	1. Single	97	23.0
	2. Married	231	54.0
	3. Divorced	62	15.0
	4. Widow	35	08.0
	Total	**425**	**100.0**
Residential and Working District	1. Mvomero	100	25.0
	2. Kilosa	95	23.0
	3. Kongwa	91	21.0
	4. Kondoa	80	19.0
	5. Beyond	49	12.0
	Total	**425**	**100.0**
Education Level	1. No Formal Education	40	09.0
	2. Primary Education	118	28.0
	3. Secondary Education	80	19.0
	4. Certificate	69	16.0
	5. Diploma	58	14.0
	6. Bachelor degree	38	09.0
	7. Postgraduate Education	22	05.0
	Total	**425**	**100.0**

3.2 Extension Service Delivery Following Marketing Approach

This section establishes the extent to which extension services are delivered to the surveyed farmers by extension agents following marketing approach-

based skills in addition to pure agricultural skills in maize production. It must be remembered that, the marketing approach-based skills include mainly business skills and market demand skills.

The results in **Table 4** indicate that, extension services were delivered to the majority of the surveyed farmers by extension agents largely based on pure agricultural-based skills in the surveyed regions. On the other hand, extension services were delivered to the majority of the surveyed farmers following marketing approach-based skills (i.e., business skills and market demand skills) to a small extent in Dodoma and Morogoro regions.

These results imply that, maize farmers obtain extension services from extension agents however, the given extension services lack agricultural marketing skills. As a result, farmers fail to produce as per the requirements of the market, making them continue to practise subsistence rather than commercial agriculture.

Generally, the farmers in the surveyed regions were advised by extension agents on pure agricultural skills to a large extent and on business and market demand skills to a small extent in Dodoma and Morogoro regions. These results are supported by other results in the previous studies. Despite the importance of commercialized agriculture, agricultural markets, business and market demand skills among farmers still remain as major challenges (FAO, 2015; Chami, 2020). It is further established that, agriculture in Sub-Saharan Africa has historically been challenged by isolation from markets and lack of institutional support (FAO, 2015). The majority of farmers lack access to commercial markets, business and market orientation in Tanzania (Mutabazi, et al., 2010; Rwehumbiza, 2014). Also noted include lack of support and expertise in marketing and promotion of agricultural product and low access to markets among farmers due to lack of networking with other farming groups, weak relations with local government, and other local NGOs (FAO, 2018).

Table 4: Extension Service Delivery Following Marketing Approach

Scale	Pure Agricultural Skills		Business Skills		Market Demand Skills	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
To a very small extent	20	05.0	81	19.0	94	22.0

To a small extent	34	08.0	221	52.0	241	57.0
To a moderate extent	81	19.0	51	12.0	44	10.0
To a large extent	239	56.0	39	09.0	32	08.0
To a very large extent	51	12.0	33	08.0	14	03.0
Total	**425**	**100.0**	**425**	**100.0**	**425**	**100.0**

3.3 Influence of the Marketing on Maize Productivity

This section presents results addressing objective, which aimed at examining the influence of the marketing approach-based skills (i.e., business skills, market demand skills) on maize productivity among farmers in the surveyed regions. The MLR results indicate that maize productivity (outcome variable) was explained by business and market demand skills (predictor variable) by 47percent. The value obtained was .470, implying the model explained 47percent of the variance in maize productivity (see **Table 5**). In testing how well the regression model fitted the data, it was found that the computed F statistics was 36.091 with an observed significance level of 0.000. The models reached the statistical significance which was $p<0.001$ (see **Table 5**). It was predicted that, the marketing approached-based skills (i.e., business and market demand skills) had a significant and positive relationship with maize productivity in the surveyed regions. The results of regression analysis are summarised in **Table 5.**

Moreover, the results confirm that the business and market demand skills had a statistically significant and positive relationship with maize productivity (Beta=.513, t=8.309, $p<0.001$; Beta=.347, t=6.133, $p<0.001$).

These results indicate that the more the farmers possess the given skills, the more they raise maize productivity in Tanzania. The results imply further that, maize farmers can do farming for commercial agriculture if extension services are delivered to them following marketing based-approach.

These results conform to the results in several previous researches (i.e., Mutabazi, et al., 2010; Rwehumbiza, 2014; FAO, 2018). The studies indicate that, business and market demand skills positively and significantly influence agricultural productivity in addition to other pure agricultural skills as noted in this study.

Table 5: Influence of the Marketing on Maize Productivity

	B	t	Sig.
(Constant)	6.09	19.001	<.001
Business Skills	.513	8.309	<.001
Market Demand Skills	.347	6.133	<.001
Multiple R	.738[a]		
R Square	.491		
Adjusted R	.47		
ANOVA (F, SIG.)	1.91 (< .001)		

4.0 CONCLUSION AND RECOMMENDATION

This study assessed the delivery of extension service following marketing-based approach for maize productivity in Morogoro and Dodoma Regions. The study findings have led to the conclusion that, agricultural extension services are delivered to maize farmers to a small extent following marketing approach-based skills although the given approach is statistically significant and positive to maize productivity. On the other hand, the extension agents to a large extent deliver extension services to the maize farmers following pure agriculture-based approach and not marketing-based approach.

The findings of this study imply that, the extension service following pure agriculture-based approach should be delivered in tandem with marketing-based approach for increasing maize productivity in Tanzania. The marketing-based approach would enable farmers to migrate into commercialized agriculture which simply implies production for the market requirements. The government through relevant ministry, policy makers, and other key stakeholders should enable extension agents acquire both pure agriculture and business skills for them to transfer the skills to farmers in Tanzania.

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