

**CHALLENGES FACED BY SMALLHOLDER SPICE FARMERS IN  
CONTROLLING MARKET IN TANZANIA: A CASE OF MOROGORO  
DISTRICT**

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**A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE  
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MOROGORO, TANZANIA.**

## **EXTENDED ABSTRACT**

Smallholder spice farmers in Tanzania have been engaging in spice farming and selling their crops at low price despite having great value. There have been several strategies and efforts towards supporting agricultural sector. Some of these efforts is the establishment of Kilimo Kwanza plan, Spice-sub sector strategy 2014, Horticultural development strategy as well the Agricultural sector Development Strategy (ASDS). Despite these efforts by both government and agricultural private sectors, relatively little has been achieved in supporting spice farmers to control the market. Therefore, the objective of this study was to examine challenges faced by smallholder spice farmers in controlling the market in Tanzania. The study was conducted in Morogoro district. The study adopted a cross-sectional research design. In this study, data were collected from 170 smallholder spice farmers. Interview guide, checklist and questionnaires were used. Both quantitative and qualitative data were collected. Regression and descriptive analysis were undertaken with the aid of STATA 16 to analyze quantitative data. Qualitative data were generated from focus group discussions (FGDs) and key informant interviews (KIIs). Content analysis was used to analyze qualitative data. The study finding from content analysis and descriptive analysis revealed the following. The majority of key informants during the interview pointed out that the district lacks enough human resources in agricultural extension services, and therefore this has contributed spice farmers to lack important agricultural skills. It was also reported during key informant interviews that some villages experience poor or no mobile communication networks due to a lack of communication network towers. In this study the majority (78.9%) lack good storage facilities as they store spices in places like the kitchen. Majority of the participants (65.9%) especially in turmeric farming, did not adhere to sanitation standards as they dry spices on the ground (soil surface). Again, Study findings through regression analysis showed that variables

like electricity availability was statistically significant at  $p < 0.05$ . There was a statistically significant association between electricity availability and access to market information. Therefore, farmers with electricity had an increased likelihood of accessing market information by 1.19109 log odds compared to those without.

It is concluded that market control to smallholder farmers was faced by challenges such as poor infrastructures, lack of reliable source of market information, inadequate extension services, Poor communication networks. It is further concluded that access to market information was influenced by age, education, electricity availability, means of accessing news, and ownership of mobile phones. It is therefore recommended that the government and other stakeholders should improve market information systems, introduce tax waivers in mobile phones tariffs, rural electrification, and overcome communication challenges in rural areas. Lastly, The ministry for agriculture in Tanzania and other stakeholders should pull their efforts towards improving market information systems to smallholder farmers, improve access to credit, improve extension services that are market-oriented to smallholder spice farmers.

## DECLARATION

I, John Henry Kwingwa, I do hereby declare to the Senate of the Sokoine University of Agriculture that this dissertation is my original work, done within the period of registration and that it has neither been submitted nor being submitted concurrently in any Institute.

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John Henry Kwingwa

(M. A. Candidate)

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Date

The declaration above is confirmed by;

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Dr. John Msinde

(Supervisor)

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Date

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## **DEDICATION**

This work is dedicated to my beloved wife Dr. Veneranda Masatu Bwana for her immense support which will be unforgettable. Also, to my beloved parents Mr. and Mrs. Henry Kwingwa for their great academic and spiritual foundation. May God bless them abundantly.

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## LIST OF ABBREVIATIONS

ASTA	American Spice Trade Association
COVID	Corona Virus Disease
DAICO	District Agriculture, Irrigation and Cooperative Officer
DCDO	District Community Development Officer
ESA	European Spice Association
FAO	Food and Agriculture Organization of the United Nations
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GFP	Golden Food Product Company
HODECT	Horticultural Development Strategy
IFC	International Finance Corporation
ITC	International Trade Centre
KII	Key Informant Interview
NEI	Natural Extractive Industry
NGO	Non-Governmental Organization
PPP	Public Private Partnership
REA	Rural Energy Agency
REPOA	Research on Poverty Alleviation
SACCOS	Savings and Credit Co-Operative Society
SAT	Sustainable Agriculture Tanzania
SDG	Sustainable Development Goal
SIDO	Small Industries Development Organization
STATA	Statistical Software for Data Science

SUALISA	Sokoine University of Agriculture Laboratory for Interdisciplinary Statistical analysis
TARURA	Tanzania Rural and Urban Roads Agency
TDV	Tanzania Development Vision
TOAM	Tanzania Organic Agriculture Movement
TZS	Tanzania Shillings
URT	United Republic of Tanzania
VEO	Village Executive Officer
WEO	Ward Executive Officer

## **CHAPTER ONE**

### **1.0 INTRODUCTION**

#### **1.1 Background Information**

Globally, spice crops production trend shows that India is the largest producer of spices which dominates the international market. In 2014 - 2015 the total spice production in India was 6161 thousand metric tonnes (Boyal and Mehra, 2016). Other countries with considerable production include China, Bangladesh, Pakistan, Turkey, and Nepal (ITC, 2014). The global spice market share is dominated by pepper chilies by 46 percent, Saffron, turmeric, and curry account for 22 percent. The main international markets for spices include Europe, Asia-Pacific, and North America. Europe is dominating spice market share having 35 percent followed by Asia-Pacific account 31 percent.

Africa contributes 12 percent of global spice production (REPOA, 2018). One of the leading countries in Africa for spice production is Ethiopia (ITC, 2010). Other spice-producing countries are Nigeria and Madagascar. Spice farming is practiced by the majority of smallholder farmers however, smallholder farmers still are faced with the problem of limited access to credit as well as the reliable market (IFC, 2014).

In Tanzania, 90 percent of exported spices is clove followed by black pepper (REPOA, 2018). It has been reported that Tanzania is having a wide range of spices grown due to the existence of favourable climate and soil conditions as it is having different climatic zones and arable land (ITC, 2014). Spice is cultivated in areas with high rainfall over 1 500mm per annum and temperature 20°C - 35°C altitude between 300 and 1 000m above sea level (ITC, 2014).

The most important spice crops produced in Tanzania for the local market and for exporting are clove, pepper, chilies, cinnamon, cardamom, ginger, coriander, vanilla, garlic, lemongrass, and red onions (ITC, 2014). Clove, cardamom, and cinnamon are mostly produced in Morogoro, Mbeya, and Tanga in mainland Tanzania. In Zanzibar and Pemba clove is highly produced. Ginger is produced in Kilimanjaro, Kigoma, and Mbeya Region. Vanilla is produced in Mbeya, Morogoro, and Kagera. However, due to different ecological, altitude, temperature, humidity, and rainfall, there is also great variation in harvesting. Spices have got multiple uses. Spices can be used to flavour bread, butter, meat, soups, and vegetables as well in the manufacturing of medicines and perfumes. (ITC, 2014). Despite this importance, the spice sector in Tanzania is faced with several challenges like post-harvest challenges such as poor sanitation among smallholder farmers as well problem related to standards adherence (ITC, 2014; REPOA, 2018).

In Morogoro Region, Clove, pepper, cardamom, and cinnamon are common spices produced by smallholder farmers. Smallholder farmers face numerous difficulties when it comes to spices marketing. Farmers often depend on farm gate price which is low and sometimes dictated by middlemen thus failing to control the market. In Morogoro district, several efforts have been made by agriculture organizations such as Sustainable Agriculture Tanzania (SAT) to support smallholder spice farmers.

Several strategies have been made by both public and private sectors in addressing market challenges for smallholder farmers. Those challenges were such as problems related to accessibility to market information as well as lack of credit support. One of such effort is the implementation of Kilimo Kwanza plan and the Big Result Now (BRN) as policy measures (Lyatuu *et al.*, 2015). Also, several agricultural plans and programs eg Agriculture sector development strategy (ASDS 1), Tanzania horticultural development

strategy have been formulated and implemented. In horticulture for instance spice-sub sector strategy was developed for addressing spice farmers' challenges. However, despite all the above efforts, smallholder farmers in Tanzania have failed to control the spice market. A well-functioning agriculture management practices and market strategies are therefore important aspects that can help smallholder farmers control the spice market. Agriculture management practices include farmers' pre-and post-harvest activities before getting into the market. The essence of agriculture management practices is to ensure both good productivity and crops quality. Farm-related practices such as disease control and other activities involved in post-harvest should be carefully done to maintain and meet the required market standards (ITC, 2014). Also, a good market spice marketing system is crucial within the spice value chain for smallholder farmers to realize the profit.

Therefore, the study on this manuscript is aimed at examining challenges faced by smallholder spice farmers in controlling the market. Thereafter proposing possible measures on how to support smallholder spice farmers with a reliable market. Again, the findings shed light to different spice stakeholders in making informed decisions making .Also, help in establishing a sound agriculture policy under coherent framework and strong agriculture market systems. Hence, enabling the achievement of the sustainable development goals (SDGs) one and two which target to end poverty in all forms.

## **1.2 Problem Statement**

In Tanzania, smallholder farmers have been engaging in spice farming and selling their crops at very low prices despite having great value (REPOA, 2018). Also, there have been several strategies and efforts towards supporting agriculture sectors for instance development of spice-sub sector strategy 2014, Agriculture sector development strategy II

(2015/2016-2024/2025), Tanzania horticultural development strategy have been formulated and implemented. There are also several good agriculture practices guidelines to support farmers to adhere to the needed standards. Furthermore, there has been establishment of farmers' organizations and NGOs which support smallholder farmers such as Sustainable Agriculture Tanzania (SAT) and Tanzania Organic Agriculture Movement (TOAM). However, despite several efforts above done both by government and agriculture private sectors, relative less has been achieved in supporting spice farmers to control the market. Again, Morogoro district as one of spice producing regions suffers from a poorly developed spice marketing value chain. Small scale farmers tend to be powerless in terms of decision-making on selling their products at a good price.

Several studies have been conducted on the spice market to smallholder farmers. For example, a study by Fundikira (2019) assessed the contamination of aflatoxin in marketed spices in some major markets in Tanzania. Again, a study by Mkojera and Chove (2019) assessed the safety and quality of organically grown cloves (*Syzgium aromaticum*) and Black pepper (*Piper nigrum*). Negera (2015) analysed factors determining the supply of cardamon. Generally, none of the above studies have taken an interest to examine challenges facing smallholder spice farmers in controlling the market which is the focus of this study, thus little is known. Therefore, from that point of view, there was a need for a study to be conducted to fill this knowledge gap.

### **1.3 Study Justification**

This study is in line with sustainable development goal number one which targets to end extreme poverty by 2030. It is also in line with the second five-year development plan as a component of Tanzania Development Vision 2025 (TDV) (11) which aimed at making Tanzania an industrialized country in which agriculture plays a key role in providing raw

materials. (URT, 2016). It is also in line with Sustainable Development goals (SDGs) i.e goal number one and two which emphasizes ending poverty in all forms. This study further helps policymakers in their areas to have room for reviewing agricultural policies and come out with the wisest decisions and sound policies on how to improve spice crop production and marketing in the country. In addition, the findings are helpful to the organizations which support farmers to have informed decisions when it comes to targeted interventions on improving spice profit and livelihood to smallholder spice farmers.

#### **1.4 Research Objectives**

##### **1.4.1 Overall objective**

The overall objective of this study was to examine challenges faced by smallholder spice farmers in controlling the market in Morogoro District, Tanzania.

##### **1.4.2 Specific objectives**

Specifically, the study aimed at: -

- i. Examining agricultural market challenges faced by smallholder spice farmers in controlling the market.
- ii. Examining smallholder spice farmers' farm management practices that affect the spice market.
- iii. Determine socio-economic factors that influence the accessibility of market information among smallholder farmers.

#### **1.5 Research Questions**

- i. What are the agricultural market challenges faced by smallholder farmers in controlling the spice market?
- ii. Why farm management practices affect spice market control of smallholder

farmers?

- iii. How do socio-economic factors influence the accessibility of market information among smallholder spice farmers?

## 1.6 Conceptual Framework

The study conceptual framework (Figure 1.1) below, shows hypothesized relationship between factors that contribute to the existence of a controlled spice market, interconnectedness, and interactions among factors. The dependent variable which is the controlled spice market is an outcome of related factors which are independent variables. The assumption behind this is, for the spice market to be successfully controlled, interrelated supportive factors are crucial. According to Ferris *et al.* (2014), smallholder farmers' strategies play a vital role in supporting crops marketing. Interrelated factors either directly or indirectly may support the success of the dependent variable.

The existence of sound agriculture policies which are within coherent framework can support agriculture marketing. Sound policies with coherent framework can support farmers with price, management, and other related support. Government can influence price indication, this can be possible through good Public Private Partnership (PPP). Through this, smallholder farmers can be in a good position of controlling the market contrary if the sector is left to operate on its own.

Coordination among stakeholders is one of important factors that can support smallholder farmers control the market. Coordination helps good communication and avoid repetitions of services to the targeted groups and strengthens the roots of projects sustainability. According to Semwenda (2016) lack of coordination can lead to confusion for farmers. This once happen can cause repetition of project intervention in the same area .

Therefore can contribute to wastage of resources that could enable smallholder farmers being empowered. Due to this, smallholder farmers may lack important skills that could enable them control the market.

Another important factor for market control is resources, these are both financial and human resources. Resources are very crucial to help smallholders farmers for their market control. For instance, availability of resources including financial resources and human resources have a vital role to play in improving the quality of farm produce. Study by Desalegn (2015) in Ethiopia found that poor access to credit facilities affected negatively spice marketing. Lack of resources can contribute smallholder spice farmers to be weak in controlling their market in the sense that they may not be able to sell the produce of high quality. A study by Phiri *et al.* (2012) in Malawi found that shortage of extension workers affected negatively the provision of extension service. This, therefore show vividly that in order for smallholder spice farmers to control market different interrelated factors are of great importance, resources being one of them.

Again, extension services to farmers as well legal support factors can contribute smallholder farmers to control the market. Extension services offer different skills to farmers such as marketing skills thus supporting farmers to be in a position of getting profitable market. On the other hand legal support plays an important role in supporting farmers with a win-win situation, controlling marketing, and controlling crop quality standards.

Infrastructures is one of the factors that may contribute smallholder farmers either to control or loss control of the crops market. Presence of good infrastructures can ensure farmers with a reliable market, reduce transactional cost and increase farmers' bargaining

power. A case study of spice marketing in Ethiopia showed that poor infrastructures tend to lower spices farmers' bargaining power and end up with a poor price (Negera, 2015). According to Chapoto *et al.* (2013) access to roads and transport is vital in supporting smallholder farmer's markets. Farmers who live in remote areas have less market access. Skills trainings and linkage can also contribute smallholder farmers to access and control the crop market. Farmers who receive pieces of training through formal education and on-farm base extension are more likely to create market linkage than those who do not get training (FAO, 2011). On the side of linkage groups, smallholder farmers who are in groups are more likely to receive pieces of training or any support than the individual farmer. This in one way or another can contribute smallholder farmers to control or loss control of the market.

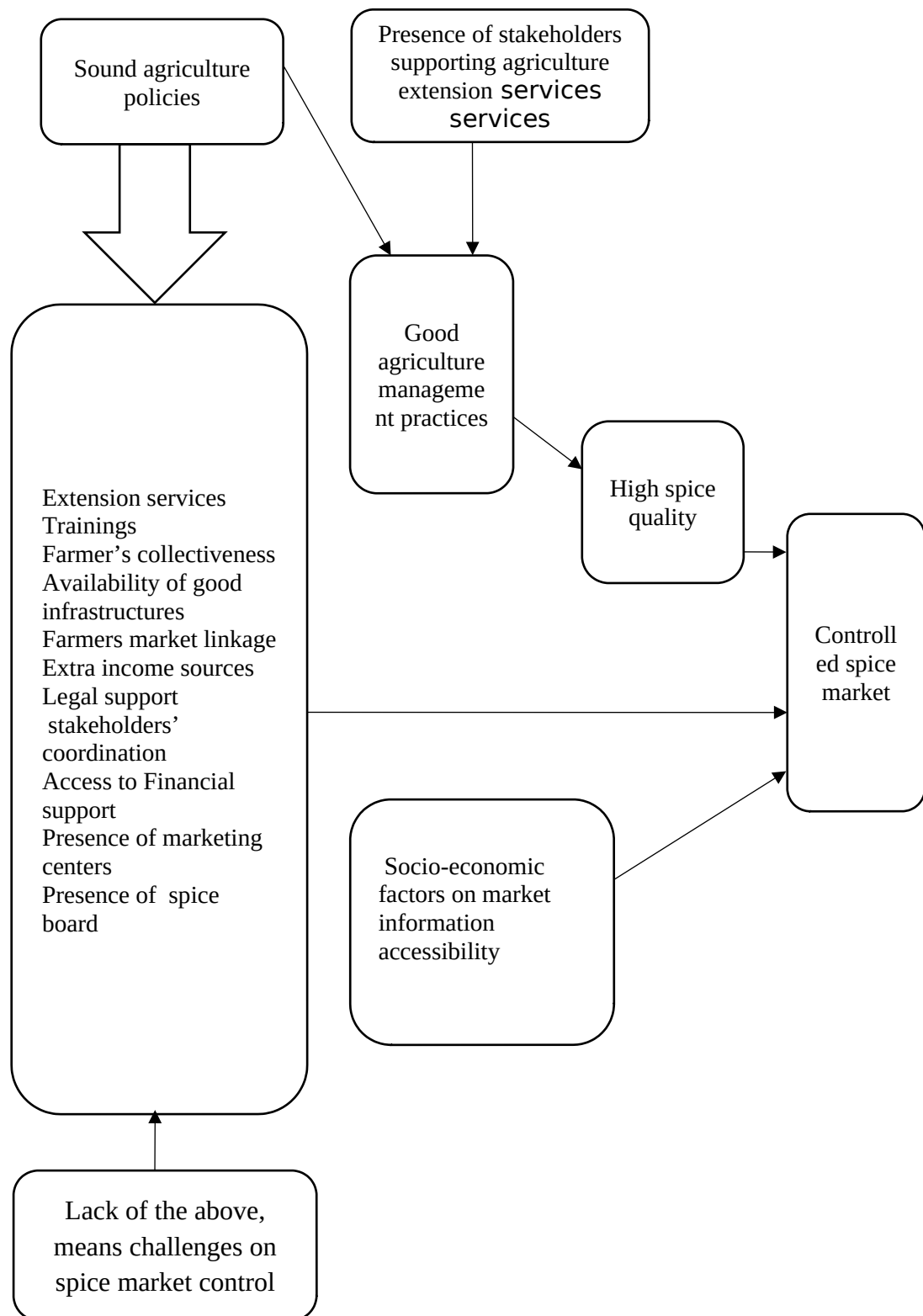
Collective marketing and contract farming, when smallholder farmers have decided to come up together, they can be in a good position of having bargaining power and control the market than individual farmers. According to Ochieng *et al.* (2018) farmers groups can be in a better position of gaining power and other benefit. They can receive various training such as group management skills, marketing skills, financial skills, as well as innovative skills. In contract farming smallholder farmers are provided with direct sales agreements per laid agreed quality standards and specifications. In this sense smallholder farmers can be in a good position of controlling the market. Lack of contracts can pose a great challenge of not controlling the market and end up being in losing side completely.

Value addition and storage can also contribute smallholder farmers to control or not control the market. Value addition can be done whereby farmers increase shelf life or quality of spice into a new form instead of selling directly from the farm. Once spice is added value its price can be better and attract many buyers than if it is sold without any

value addition. Storage can be done by farmers once spices are well dried and prepared well, once stored, farmers can be in a position of waiting for a better price shortly. According to FAO (2016) farmers can realize good market and profit if they store their produce and wait for a better price. This is contrary to when produce is sold immediately after being harvested.

Good pre-and post-harvest practices such as disease control, good dehydration, good storage facilities and storage places sanitation, spice grading, technologies used, have great influence in supporting spice marketing. Poor pre and post-harvest practices can bring great challenges on the quality of spices thus contributes smallholder farmers to lose control of the crop market.

Lastly, socio-economic factors such as level of education, farm size, means of accessing news, ownership of mobile phones, marital status, farm income can influence smallholder farmers to access market information. Also, presence of NGOs, cooperatives can support farmers by creating an enabling environment to control the market.



**Figure 1.1: Conceptual Framework for challenges faced by smallholder spice farmers in controlling the market.**

### **1.7 Organization of Dissertation**

This dissertation is organized into four chapters, chapter one covers the background information and introduction of the overall objective of the study. Chapter two comprises publishable manual script number one which covers objectives number one and two and answers research question number one and number two. The next chapter is chapter three which comprises publishable manual script number three which covers objective number three of the study. Also, it answers research question number three. The last chapter is chapter four, it covers a summary of major findings and general conclusions of the study as well as general recommendations.

### **1.8 Limitations of the Study**

The study had the following limitations, firstly, the study was conducted during the farming season. Therefore, the schedule for meeting with farmers had to change. However, with support from local government leaders, farmers responded well. Secondly, the study was conducted during the early period of the COVID-19 pandemic thus farmers were reluctant to participate, however, farmers' group leaders and local government leaders in respective areas helped to solve this challenge. The third and last limitation was the scatteredness of farmers and the geography of the study area since many farmers live in mountainous areas. Transport was a challenge in some higher altitude villages like Lugeni and Tandali. To solve this, the researcher and assistant decided to go on foot in some places with support from villagers.

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## **CHAPTER TWO**

### **2.0 CHALLENGES FACED BY SMALLHOLDER SPICE FARMERS IN CONTROLLING THE MARKET IN TANZANIA. A CASE OF SELECTED VILLAGES IN MOROGORO DISTRICT**

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## 2.1 Abstract

In Tanzania, smallholder farmers have been engaging in spice farming and selling their crops at very low prices despite having great value. Therefore, the objective of this study was to examine challenges faced by smallholder spice farmers in controlling the market in Morogoro District, Tanzania. The study adopted a cross-section research design. Structured questioners were used for collecting quantitative data from 170 smallholder farmers. Qualitative data were collected through focus group discussions (FGDs) whereas checklist was used. A total of eight FGDs were conducted consisting of 9-10 participants. Also, a total of nine Key informant interviews were held with the aid of interview guide. STATA 16 was used for descriptive analysis to generate frequencies and percentages. Content Analysis was used for the analysis of qualitative data. The study findings show that inadequate agricultural extension services, absence of spice management board, poor infrastructures, lack of marketing centers, absence of farmers' collective actions, lack of reliable source of market information, weak legal support, absence of credit support were challenges faced by smallholder spice farmers in controlling market. The study further through descriptive analysis revealed that poor spice quality affected farmers to control the market. Moreover, smallholder farmers reported that lack of post-harvest technologies was another challenge. There is a need for establishment the mechanism of managing spice sector for the benefit of all players within spice market chain. It is therefore recommended that the Government of Tanzania and other stakeholders should establish a spice management body for addressing different market challenges, also establishing a strong spice marketing system.

**Keywords:** Smallholder farmer, spice market challenges, spice marketing system

## 2.2 Introduction

The world spice crops production trend shows India is the largest producer and exporter of spices dominating the international market. In 2014 – 2015 the total production in India was 6161 thousand metric tons of which 893 920 tons of spices were exported (Boyal and Mehra, 2016). By 2018 the world spice production was reported to reach 12.8 million tons (FAO, 2019). Other countries with considerable production include China, Bangladesh, Pakistan, Turkey, and Indonesia (FAO, 2019). The main international markets for spices include European Union, the United States, and China. Major global spice market exports are controlled by European Spice Association (ESA) and American Spice Trade Association (ASTA) standards in EU and US markets (REPOA, 2018). European buyers are guided by European Spice Association to adhere to the quality minima document of 2015 for importing spice (REPOA, 2018).

Spices exporters are needed to comply with laid safety standards due to the excessive level of aflatoxin contamination, pesticides, and salmonella (ITC, 2014; REPOA 2018). Smallholder farmers fail to abide with required standards due to lack of technology, lack of capital, and education on standards (Negera, 2015; Tesfa *et al.*, 2017). According to International finance cooperation (IFC, 2014), smallholder farmers are faced with a credit support challenge that would support them in owning technologies that could enable in improving their crops market. They are also faced by limited market information (FAO, 2016).

In Africa, Agriculture is the only sector that employs 80 percent of the population of which 50 percent are smallholder farmers (IFC, 2014). Also, agriculture plays a considerable role in the livelihood development of rural people (IFC, 2014; FAO, 2016). African global share for spice production is 12 percent (REPOA, 2018). In Africa,

Ethiopia is having high spice production and export, produced 356,000 tons by 2018 where chilies were leading (Titus and Wojtek, 2020). Another country leading for producing spices in Africa is Madagascar specifically on vanilla farming. Other countries are Nigeria, Kenya, North Africa, Uganda, and Tanzania. Smallholder spice farmers in Africa are faced with several challenges from production to marketing (IFC, 2014).

In Tanzania, agriculture is a great contributor to the country's GDP accounting for 26.9 percent of GDP in the national economy and 24 percent of total export in 2019/2021 (URT, 2021). The majority of Tanzanians over 70 percent live in rural areas whereby 62.8 percent are depending on the agriculture sector (URT, 2021). Spices farming being the sub-sector in agriculture contributes greatly to the development of rural livelihood (URT, 2021). Spice farming in Tanzania is practiced mostly by smallholder farmers in both organic and conventional farming (Mkojera and Chove, 2019). Spices producing regions are Kagera, Tanga, Morogoro, Kilimanjaro, Kigoma, Mbeya, and Zanzibar. The most important spice crops produced and exported in Tanzania from 2012 to 2016 were vanilla, pepper, clove, ginger, turmeric and cinnamon (REPOA, 2018). In Tanzania over 90% of exported spice comprises of clove (ITC, 2014; REPOA, 2018).

Despite its contribution to Tanzania's national GDP growth, the spice sub-sector among smallholder farmers is faced by safety and quality management challenges, informal market systems, weak support from local government, and lack of quality management (ITC, 2014; REPOA, 2018). For example, most smallholder farmers face the challenge of incomplete market information and always depend on traders (Aku *et al.*, 2018). There have been several efforts towards addressing spices sector challenges such as the development of a national spice sub-sector strategy which aimed at addressing and proposing possible measures. Also, there have been several development partners giving

substantial support to the spices sector such as Tanzania Organic Agriculture Movement (TOAM) (REPOA, 2018).

Various supports have been given by the government and other interested parties to strengthen the spice sector such as the establishment of a spice subsector strategy. However, relatively less has been achieved in addressing the market control challenges. Various studies have been conducted on spices. For example, Mahmoud (2013) conducted a study on the inclusion of small-scale farmers in the spice value chain in Zanzibar where the study found poor coordination among actors within the spice value chain. A study conducted by Fundikira (2019) assessed the contamination of Aflatoxin on marketed spices in Tanzania. Another study was conducted by (Mkojera and Chove, 2019) explored the safety and quality of black pepper and clove grown organically in Tanzania. Also, Magesa *et al.* (2014) their study was based only on one factor which was access to market information by rural farmers in Tanzania.

A number of these previous studies were undertaken (Magesa *et al.*, 2014; Fundikira, 2019; Mkojera and Chove, 2019; Fundikira, 2019) but none of these had shown keen interest to examine challenges faced by smallholder spice farmers in controlling market which was a focus of this study. Therefore, this study aimed at bridging this knowledge gap. This study also provides a detailed understanding of the challenges faced by smallholder farmers in controlling spice markets. The study findings, therefore, provide useful information to policy makers and other stakeholders in addressing smallholder spice farmers' market challenges. Also, enable stakeholders in the spice sector to have informed decision-making in establishing sound agriculture policy, hence enabling achievement of the Sustainable Development Goals (SGDs) one and two which aimed at ending poverty in all forms.

## **2.3 Theoretical Framework**

This study was guided by social exchange theory since overcoming farmers' challenges on market control involves the interconnection of different factors. Also, it involves linkage between farmers' related attributes and different actors within the production chain. The social exchange theory stipulates that those levels of information, knowledge and, power within stakeholders influence decision making (Thomas and Thigpen, 1993). With regards to this theory, stakeholders such as non-governmental organizations, companies, and governments have great roles in supporting smallholder farmers. These stakeholders are engaging in different activities such as policies implementation, laws and regulation formulations, planning, credits provision as well training. Also, social exchange theory has been chosen to guide this study since solutions for challenges on market control in most cases involve exchanges of ideas and require collective actions among farmers.

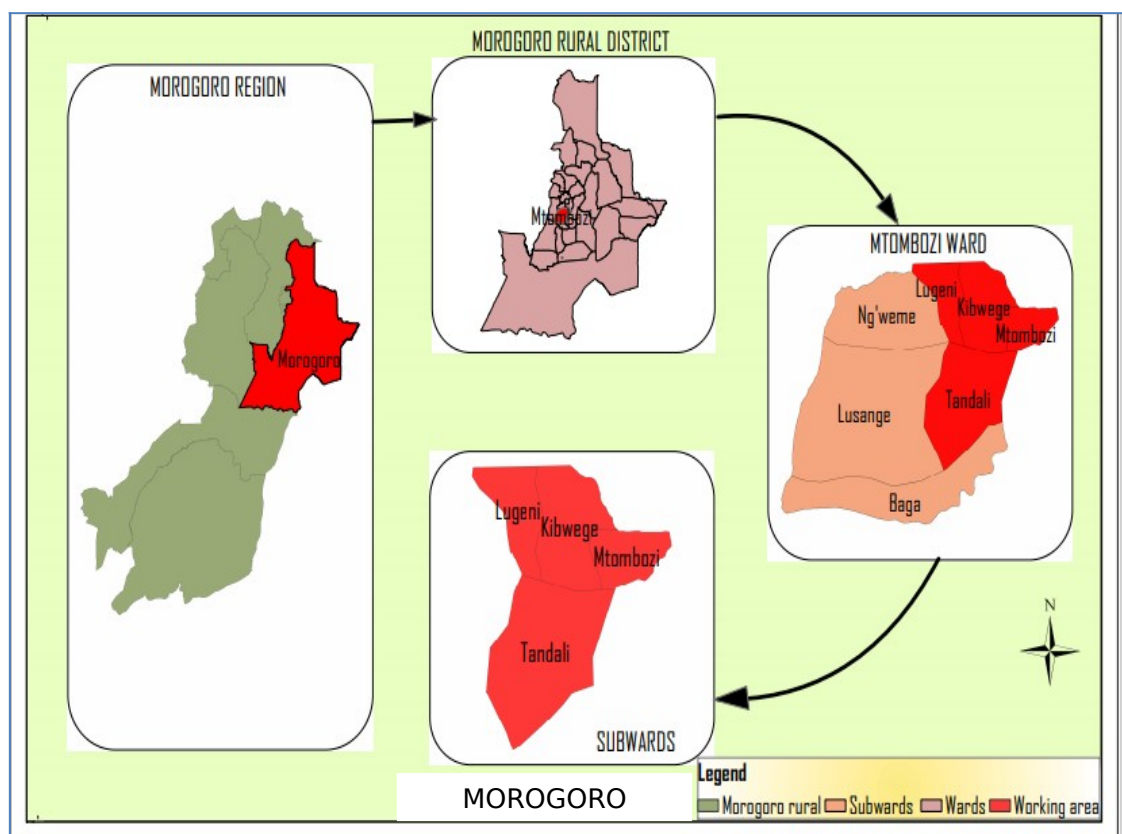
This study also, was guided by networking theory. Networking plays a significant role in the organization or individual products sell (Moeller, 2010). The relation is necessary for acquiring market information which helps in overcoming the market challenges thus controlling the market. According to Thomas and Thigpen (1993) networking helps society to exchange different information which can create and improve power together with decisions. This theory has been chosen in this study since market control is supported by different factors which require networks resulting from relations between individual farmers and also helps in improving collectiveness among farmers.

## **2.4 Research Methodology**

### **2.4.1 Study area description**

The study was conducted in Morogoro District which is one among six districts of Morogoro Region. The region covers 19 056 square kilometers with a population of

286 248 (URT, 2012). Morogoro District has the following political division, it has 6 divisions, 29 wards, and 214 villages (URT, 2012). This study was conducted in the Mtombozi ward in the following selected villages: Mtombozi, Lugeni, Tandali, and Kibwege (Figure 2.1). The study area has a great number of smallholder farmers who engage in spice farming in mainland Tanzania having for instance 641 ha cultivated with clove (URT, 2021). Also, it is an area where stakeholders such as Sustainable Agriculture Tanzania (SAT) provide production and marketing support to smallholder spice farmers. This is the main criterion for choosing this area. The study area is experiencing an average temperature between 18<sup>0</sup>c on the mountain areas to 30<sup>0</sup>c in valleys (URT, 2012). The major economic activities are crop farming both food and cash crops, however, in some lowland areas, indigenous people practice animal husbandry (URT, 2012).



**Figure 2.1: Map showing position of Morogoro District and selected villages. Source:**

**Author, with support from SUALISA**

### **2.4.2 Sampling procedure**

The study adopted a cross-sectional research design where data were collected once at one point in time. The research design helps to save time and money (Neuman, 2014). A purposive sampling procedure was adopted to select district, ward, villages, and focus groups discussion participants as well as key informants in the study area. The selection criteria for the district, ward, and village were high spices production and marketing as compared to other regions. A simple random sampling procedure was conducted where a total of 170 smallholder spice farmers were randomly selected from farmers' records at sustainable agriculture Tanzania (SAT) and other agriculture offices to participate in the study. According to Louangrath (2017) in social science minimum number of samples from 30-200 is satisfactory for statistical analysis.

### **2.4.3 Data collection**

In data collection, focus group discussions (FGDs) and key informant interviews (KIIs) were used to collect qualitative data. The household survey method was used to collect quantitative data from smallholder farmers with the aid of structured questioners. A total of eight FGDs were conducted of which each FGD had 9-10 participants. FGDs participants were selected based on experience in spice farming, spice marketing, type of spices produced, age, and sex of the farmer. Before FGDs farmers were asked for their consent in participation as far as ethical consideration is concerned. During the discussion, participants were freely giving their explanations on market control challenges. Notes were taken by the research assistant thereafter at the end they were read to allow respondents to add where they were not captured well.

A total of nine key informants interviews (KIIs) were conducted including District community development officer (DCDO), District agriculture, Irrigation and cooperative

officer (DAICO), ward agriculture field officer, ward executive officer (WEO), village executive officer (VEO), NGO, one village leader, and spice traders. The inclusion criterion for participation in the in-depth interview was both farming and marketing experience in the spice sector.

#### **2.4.4 Data analysis**

In this study, both content analysis and descriptive analysis were used. In Content analysis, the collected notes from FGDs and KIIs were clearly read. Thereafter the process of coding was done followed by themes categorization. The study findings from content analysis were supported by quotes from KIIs and FGDs participants. Descriptive analysis was done by STATA 16 whereby frequencies and percentages were generated.

### **2.5 Results and Discussion**

#### **2.5.1 Respondents' socio-economic and demographic characteristics**

Table 2.1 below, shows the socio-economic and demographic characteristics of respondents. The study findings (Table 2.1) show that the majority of respondents (61.2%) were male. This might be due to the reason that females were busy engaging in domestic activities. These findings are in line with the findings by Hassan (2015) who found that majority of respondents almost (80%) were male. Study findings in Table 2.1 also show (35.3%) of respondents were in the middle age group between 36-45 years of age. The results suggest that the study area has a great number of active age groups to support agriculture activities. The result in Table 2.1 also shows a higher percentage of respondents (69.1%) were married. It suggests that the majority of respondents were settled, thus engaging permanently in their spice farming activities than those who were not married. During one of FGDs some of the participants reported that by being in a marriage, farming activities are taken seriously and one participant was quoted saying as

follows:

*“Most of the people who take farming seriously here are those who are married. Those who are having families since they depend on farming as their primary source of income. Those who are not married are so mobile and mostly are youths as they also engage in various activities out of farming”* (A 50 years old woman, FGD participant, Lugeni village, Morogoro District).

The result further shows the majority of respondents (77.6%) had attained primary education (Table 2.1). The result implies that a larger percentage of the population had attained basic education and are trainable hence, education can support them attain various farming and marketing skills. Formal education is of a paramount importance for agriculture improvement. According to Magesa *et al.* (2014) education supports farmers in accessing agriculture market information.

Study results in Table 2.1 further show that the majority (85.9%) of respondents own one to three acres while those with less than one acre were 1.2%. This implies that agriculture is the primary source of income. Study results further show that only 1.8% of respondents had six acres and above, implying that spice farming is mostly practiced in small-scale farms. The study finding is similar to the observation made by the Government of Tanzania in the Agriculture census main Report of 2021 which shows that smallholder farmers occupy 99.4 % of agricultural land (URT, 2021). Study results as presented in Table 2.1 show the majority of respondents (41.2%) had annual income, 100 000 TZS – 300 000 TZS generated from spice farming.

**Table 2.1: Socio-economic and demographic characteristics of respondents (n=170)**

Characteristics		Frequency	Percentage (%)
Sex of respondent	Male	104	61.2
	Female	66	38.8
Marital status	Married	118	69.1
	Divorced	13	7.9
	Widowed	8	4.8
	Single	31	18.2
Education Level	No formal education	22	12.9
	Primary school	132	77.6
	Ordinary secondary	15	8.8
	High school	1	0.7
Age Category (years)	18-28	25	14.7
	29-35	27	15.9
	36-45	60	35.3
	46-60	37	21.8
	60 and above	21	12.3
Farm size (Acres)	1-3	146	85.9
	4-5	12	7.1
	5	5	2.8
	6	2	1.2
	Less than 1	2	1.2
	More than 6	3	1.8
Annual spice income (TZS)	100 000-300 000	70	41.2
	300 000-600 000	38	22.4
	600 000-1 200 000	30	17.6
	1 200 000-1800 000	11	6.5
	2 000 000 Above	21	12.3

## 2.5.2 Challenges facing smallholder spice farmers in controlling the market

### 2.5.2.1 Lack of farmers marketing centers

Farmers' market centers are centers where farmers collectively sell their crops. In this study through key informants' interviews, it was noted that the district has no protective measures in the sense that there are no centers where spice farmers could collectively sell their spices. This implies that middlemen have room to carry on with exploitative

behavior. Lack of spices marketing centers from the ward to district level was reported by many key informants. This lack of market centres deprive spice farmers from having reasonable prices as they lack collective bargaining power. It was also noted during FGDs held in Lugeni and Mtombozi villages that middlemen go directly to the spice farmers' farms and dictate price thus lowering the spice price. According to Jayne *et al.* (2019), marketing centers for collecting and selling farmers' crops ensure good prices and standards. This was supported by the following key informant who was quoted saying;

*“The tendency of middlemen getting directly to the farmers is a big challenge in this district. This chain is very exploitative and contributes to farmers’ sufferings. The district is now building a spice market center at Tawa whereby all spice marketing in the district will be done. It will be a center where spice farmers will meet with buyers, however due to transport challenges other centers at ward levels are needed”* (Key informant, District Agriculture, Irrigation and Cooperative Officer, Morogoro District, January 2021).

#### **2.5.2.2 Poor coordination and cooperation among stakeholders**

Another challenge noted during the key informant interview was poor coordination as well poor cooperation among stakeholders who support smallholder farmers. This implies that project activities like proper spices drying might lack sustainability roots. Also lack emphasis and eventually benefit few smallholder farmers either in pre-and post-harvest management or marketing. One key informant had this to say;

*“Sometimes we are not aware of what is going on in our fields. You might find some new activities are done by farmers but you are not aware of them. If we could have good cooperation, then we would have farmer’s platforms in both ward and district level whereby market challenges could be advocated via mass*

*media to the decision-makers”* (Ward Agriculture field officer, Morogoro District, February 2021).

Several studies show that stakeholders like NGOs, once working together can be in a good position of having collective action which benefits smallholder farmers (Halbach, 2011; Ferris *et al.*, 2014). Coordination and cooperation among stakeholders are crucial since they help in resource mobilization, technology, and market linkage (Donovan, 2011).

#### **2.5.2.3 Lack of sufficient farmers' training**

The government as the stakeholder has the role of creating an enabling environment for the private sector. Lack of enough farmers' training was another challenge noted from FGDs participants as well from key informants. It was reported by key informants that the local government had no enough budget to organize trainings for the spice farmers. This implies smallholder spice farmers lack important agriculture skills and knowledge that would support them in crops marketing. It was further reported in this study during key informant interviews that training was conducted to farmers who are in groups working with NGOs and companies. The NGO mentioned was Sustainable Agriculture Tanzania (SAT) and companies like Golden Food Product Company (GFP) as well as Natural Extractive Industry (NEI). The criterion was that farmers should be in groups and practicing organic farming. This implies that the majority of farmers who were not attached to these organizations never attend market trainings hence lack some of the important market skills which would help them in market searching as pointed out by one key informant as follows;

*“Majority of smallholder spice farmers never attended any market training for many years. There was no market training ever conducted to spice farmers in this district as per authority budget. Most of pieces of training is done by Companies*

*and NGOs to their farmers' groups”* (Key informant, District Agriculture, irrigation and cooperative officer, Morogoro District, January 2021).

Again, during FGDs held in Lugeni Village majority of participants reported a lack of training sessions by the local government and that they were depending on other stakeholders something that affected their ability to control their market. One participant was quoted saying the following;

*“Most of smallholder farmers here are given trainings by companies like NEI and some by SAT .If Local government could have training program on marketing, I hope market could easily be controlled, but it is hard here to get training from Local government”* (a woman 50 years old, FGD participant, Morogoro District, February 2021).

Similarly, a study by Ferris *et al.* (2014) found that farmers who get training sessions are in a better chance of creating market linkage, increase production sustainably compare to those who do not get training sessions. In addition, a study by REPOA (2018) reported that lack of local government support to smallholder farmers when comes to spice marketing is one of the big challenges in Tanzania.

#### **2.5.2.4 Poor financial support to smallholder spice farmers**

Finance is important in supporting spices farmers to invest in their marketing strategies and farming activities. Poor financial support was one of the challenges revealed in this study. During FGDs in Lugeni village, smallholder farmers discussed widely that they lack capital that could support pre-and post-harvest activities. Furthermore, they reported selling their spices to middlemen before harvesting time to get money for supporting their activities since they lack extra income. Suggesting to sell their crops at any price to solve their financial challenge at the household level. It was noted from FGDs that some

smallholder farmers wish to initiate other income-generating activities to reduce dependency on spices crops and thus increase their bargaining power but lacking financial support. One participant had this to say during FGD as follows;

*“We request to be given more financial support so that we establish income-generating activities. For example, currently, we have a few hens as a group where I live, but this is nothing because we are many. We have been told to establish groups to get a loan from district council but since last year there is nothing”* (A woman, aged 40 years, smallholder spice farmer, Lugeni village, Morogoro District, 2021).

It was further reported by key informants that lack of finance creates an obstacle to supporting smallholder spices farmers with capital to invest in the production of high-quality spices. One of the key informants attested that;

*“Honestly speaking majority of farmers are poor and have no collateral as financial sectors have no trust on them. Even if they could have but there is no any farmers financial institution. We had Mtamba SACCOS for example but is not operating anymore”* (Key informant, District Agriculture, Irrigation and Cooperative Officer, Morogoro District, January 2021).

The financial challenge was also mentioned by the majority of key informants. For example, it was reported by the District community development officer that the district council in their special funds' program has only supported three spices farmers groups for 2019/2020. Key informant, DCDO had the following to say;

*“In this district, we have special funds to support youths, women, and people with disability. This year we have planned to support four spices farmer's groups, but this is very little compared to the number of spice farmers. We wish if we could get*

*more support from other empowerment bodies to support spice farmers on how to process their produce, pack them and sell them”* (Key informant, District community development officer, Morogoro District, January 2021).

Similarly, Desalegn (2015) in the study conducted in Ethiopia found that poor access to credit facilities affect negatively spice marketing. Majority in this study accounting 68.2% lack sources of credits, suggesting to effects negatively their spice production and marketing. According to the Tanzania Agriculture census report of 2019/2020 out of 7 837 405 agriculture households, only 294,618 received credit for agriculture of which 217 403 (73.8 percent) were male while 77 201 (26.2 percent) were female (URT, 2021). Since, most who engage in agriculture in rural are women, this suggests clearly and evidently that smallholder farmers' agriculture credit support is still a big challenge.

#### **2.5.2.5 Lack of firm legal support**

Another challenge affecting spice market control noted by this study was the existence of weak legal support. It was noted during key informant interviews that in all villages there were no by-laws that controls and regulates spice marketing. It was also discussed by FGDs participants in Mtombozi and Lugeni villages that during post-harvest, most farmers dealing with turmeric, for instance, boil their produce and dry on the ground (soil surface). This implies that the quality of spices is affected and lowers the chances of getting good market prices. The absence of by-laws in managing smallholder farmers to adhere to sanitation was noted during KIIs that it lowers the quality of spices and discourage serious buyers as supported by key-informant who was quoted saying as follows;

*“Sincerely speaking, there is no any by law in any village, of course maybe we should propose now to the higher authority. It can help to increase spice quality.*

*Most spice farmers here in Mtombozi dry their spices especially turmeric on the ground soil surface .It is very unethical since hens, dogs, goats pass on turmeric”.*

(Key informant, Ward executive officer, Mtombozi ward, Morogoro District, January 2021).

It was further reported in KIIs that there were no regulations and farmers – villages leaders meetings were hardly conducted with respective authority for assessing spice sector challenges. Lack of meetings for addressing farmers' challenges was also mentioned as one of the obstacles as articulated by the village executive officer as a key informant.

*“I should agree that we have not ever held any special meeting with spice farmers in finding the solutions of their challenges.Also no any leaders from above have ever come in this village for meeting with spice farmers. I don’t know, maybe previous years, sincerely speaking this is what I can tell”* (Key informant, Village executive officer, Mtombozi, Morogoro District, January. 2021).

#### **2.5.2.6 Absence of management and regulatory board**

Management and regulatory boards are important instruments that if used properly can help in supporting farmers in market control. The absence of spice management board/committees at the national level/or district level was another challenge noted in this study. It was widely reported by key informants as one of the challenges faced by smallholder spice farmers in controlling the market in Morogoro District. This has contributed to this sector to look neglected. It was noted during the key informant interview that in the district there is no special board or committee which regulates the spice sector. This is contrary to other cash crops like cotton which have a special regulatory boards in Tanzania. The establishment of a spices board as mentioned by a key

informant would help spice farmers to control the spice market as it will be well regulated. The study revealed that the absence of this board has negatively affected the spice sector as it was reported by a key informant to increase farmers' exploitation since spice marketing has been left to regulate on its own. This was supported by one key informant who reported the following;

*“I think the absence of management board from national to district level on spice sector contributes to this challenge. Unlikely other cash crops like cotton, spice crops look as neglected crops. We don't have spices board in this district or any regulatory board and spices are reported as other crops, this implies that there is no seriousness given on spices, some districts have special committees. Why don't we learn from Zanzibar?”* (Key informant, District agriculture, irrigation, and cooperative officer, Morogoro District, January 2021).

It was also noted from a key informant that the establishment of spice management board or committees at both national and district levels would help in enhancing good coordination between private and public sectors. Also provides spice farmers with various support such as financial as well technological support as narrated by the following key informant who was quoted saying.

*“Currently we don't have any management board or spice committee. If we could have spice body then spices farmers in this district could be in a position of being supported with various trainings. This sector is given little attention.”* (Key informant, District agriculture, irrigation, and cooperative officer Morogoro District, January 2021).

Study findings are in line with that of Mahmoud (2013) in the study on the inclusion of small-scale farmers in the spice value chain in Zanzibar who found that lack of spice

management in the spice sector poses a great challenge to smallholder farmers in marketing. Also, Fissiha (2016) in the study conducted in Ethiopia found that lack of government control of unlicensed traders is one of the challenges facing space marketing. It was suggested by a key informant that there should be the establishment of a supportive spice body that can enable smallholder spice farmers and other stakeholders to participate profitably in spice marketing.

#### **2.5.2.7 Inadequate agriculture extension services to smallholder farmers**

Agriculture extension services have a great role to play in supporting smallholder farmers. Inadequate extension services to smallholder spice farmers was noted during the key informant interview as another challenge. The majority of key informants during the interview pointed out that the district lacks enough human resources in agricultural extension services. It was noted from a key informant that some of the villages have no agriculture extension workers. It was mentioned that this has contributed to farmers lacking collective action, marketing skills, and other important agricultural skills as supported by a key informant who was quoted said;

*“This district has few extension workers. In my ward. I have only two Agriculture extension workers, while it has seven villages”* (Key informant, ward agriculture field officer, Mtombozi, Morogoro District, February 2021).

It was further mentioned during KIIs that spice stakeholders working in the district such as Sustainable Agriculture Tanzania (SAT) and Natural Extractive Industry (NEI) have somehow managed to support smallholder spice farmers with extension services in some remote areas. Inadequate transport facilities like motorcycles were also reported by a key informant to have greatly affected negatively the provision of extension services to the spice farmers. The key informant reported that few motorcycles were bought ten years

ago hence not useful anymore. This was attested by one government officer as a key informant who was quoted said;

*“Our district is having a big challenge of transport facilities to support extension workers to meet farmers. Can you imagine this ward is having seven villages, with this one old motorcycle being used by two extension workers. It is for sure difficult to go in mountainous villages like Lugeni and Tandali”* (Key informant, Village agriculture officer, Morogoro District, February 2021).

The study findings imply that due to this shortage, many villages are rarely visited by agricultural extension workers and thus lack important agriculture skills which could enable in controlling their spice market. This finding concurs with that of Phiri *et al.* (2012) in the study conducted in Malawi which showed that shortage of extension workers and poor working environment affected negatively the provision of extension services to farmers. It was further observed that the extension services which were given to a few spices' farmers by government agriculture extension workers were concentrated only on the farm and not market-oriented. Agricultural extension workers reported they had not ever attended training on how to support smallholder farmers on marketing. Similarly, a study by Bhardwaj *et al.* (2011) in the study conducted in India showed that agriculture extension services were not market-oriented thus contributing to the spice market control challenge. It is argued that extension services play a significant role in enabling farmers to get market and improve their income (Ferroni and Zhou, 2012; Ferris *et al.*, 2014; Ferris and Irwin, 2016) According to Tanzania's annual agricultural report 2021 only 6.8 percent of smallholder farmers in mainland Tanzania received extension services while in Zanzibar was only 10.1 percent (URT,2021). This shows that extension service is a big challenge.

#### 2.5.2.8 Poor infrastructures

Another challenge that was noted by this study was poor infrastructure. The majority of key informants and FGDs participants reported that the area is experiencing great transportation challenges, especially during the rainy season since most of village roads are poor. It was also reported during key informant interviews that some villages experience poor or no mobile communication networks due to a lack of communication network towers. It was further observed that communication network was a problem in some places of Mtombozi, Tandali, and Lugeni village. Also, on road infrastructure, it was noted during FGDs conducted with smallholder spice farmers in Lugeni village that the road from Mtombozi village to Lugeni and Tandali is not passable during the rainy season. They said due to this, middlemen lower spice prices and sometimes do not come to their villages. These findings concur with that made by Magesa *et al.* (2014) in a study conducted in Hai, Kilimanjaro, Kilosa and Movomero, Morogoro which showed that smallholder farmers in rural areas experience great challenge of poor infrastructures both roads and mobile networks. This implies that in the case of poor roads, it discourages buyers as it increases transportation costs. It was further observed that the road to nearby market Morogoro town is poor and sometimes not passable during heavy rain season. It was further suggested by key informants that the construction of tarmac road from Morogoro municipal to Morogoro district headquarters 80km will attract many traders. This was attested by one government official as a key informant who was quoted said as follows;

*“Our district is having transportation challenges, most roads in rural areas are not accessible, especially during rain. The main road from here district headquarter to Morogoro municipal is a challenge. We wish if this main road could be constructed so that many people would be attracted to come in this district, perhaps that would help to open up spice market”* (Key informant,

District agriculture, irrigation, and cooperative officer, Morogoro District, January 2021)

.

Furthermore, traders as key informants complained that due to poor roads, during the rainy season some spices buyers from neighboring regions and countries like Kenya normally decide to go to other spice-producing areas. Concurring with this study observation, a spice trader as a key informant had this to say:

*“Frankly speaking poor roads is a big challenge in our district. Sometimes you need to incur a lot of money for collecting spices since some areas are not accessible. In some villages like Lugeni only motorcycles can reach there when it is not raining. The road from here Mtombozi to Morogoro town is hard to use when it is raining. Some traders decide to go other areas or wait for the rain to stop”.* (Key informant; Spice trader, Mtombozi ward, Morogoro District, February, 2021)

Similarly, the study conducted in Ethiopia by Negera (2015) revealed that poor road infrastructures in spice farming areas affect the spice market negatively as it undermines smallholder spice farmers' bargaining power. Again, Mukwevho and Anim (2014) found that poor road infrastructures are one of the constraints which cause smallholder farmers not to access the market. It is argued that stakeholders or association networks within the value chain can organize as well as express their demands and lobby to the Government (FAO, 2011).

#### **2.5.2.9 Market information asymmetry challenge and improper measurement scale**

Market information asymmetry occurs when one party within the trade possesses more market information than the other party before the transaction is done. This study revealed

that market information asymmetry to spice farmers is another challenge. It was noted from FGDs participants in a focus group discussion (FGDs) that the spice price information is controlled by middlemen from the district level up to the village levels because there is no good market information system. For example, during FGDs it was reported that one kilogram of fresh turmeric from villages was bought by middlemen at 400 TZS while traders at Morogoro central market were selling one Kilogram of turmeric from the same region at 4 000 TZS. Again, one Kilogram of black pepper was bought from villages at 1 500 TZS by middlemen and bought by traders from other regions in the district stores at 6 000 TZS per one Kilogram. The study findings concur with that of Agize and Zouwen (2016) who found that lack of marketing skills and marketing information are constraints that hinder access to spice market control. In general access to market information from improper and unreliable channels have contributed farmers to be on the negative side of low price in the study area . Confirming the above study observation one key informant, ward agriculture field officer had this to say for clarity;

*“You know what, middlemen in these villages are the ones who inform farmers the spice price. What they do is to agree on which price should they tell spice farmers in a particular period. Most of the farmers here do accept whatever price they are told and they accept since they are not guaranteed with the market. They lack reliable market information sources”* (Key informant, Ward Agriculture field officer, Morogoro District, February 2021)

In addition, in this study, an improper measurement scale was also observed to be one of the problems. It was reported by smallholder farmers in FGDs that middlemen use their scale. For example, for turmeric sellings, the bucket was observed to be used as a measurement scale. Smallholder farmers reported to overload buckets when selling fresh turmeric to the middlemen something which is legally not acceptable by the Tanzania government because it exploits farmers. Turmeric farmers in Mtombozi village said this

happens because in the villages there are no measures taken by respective authorities to restrict middlemen.

#### **2.5.2.10 Lack of collective actions among smallholder spice farmers**

In this study, lack of collective action among smallholder spice farmers was also a challenge reported during FGDs held in Lugeni village. Smallholder farmers reported to be disorganized as a result fail to establish strong marketing mechanisms that would help to control the market. It was further mentioned that middlemen use this weakness to lower prices since each spice farmer sells spices individually. It was noted in FGDs that lack of cooperative education and lack of other sources of income have contributed to farmers failure to control spice market as some were not ready to establish a cooperative society. They said even in their current established groups some of the group members sell their respective spice individually. Despite this, it was observed that some farmers were ready to establish a farmers' cooperative Society following the support from NGOs working in the district. This finding conforms with those by (Magreta *et al.*, 2010) whose findings showed that smallholders farmers are disorganized but once they come together, they can increase their market control and other support like credit. Tanzania agriculture annual report for the year 2021 shows evidently that cooperatives have great support and great importance to smallholder farmers. The report shows 50.7 percent of smallholder farmers' houses got credit from cooperatives, 45.4 percent from SACCOS while the bank was only 4.5 percent. According to Ochieng *et al.* (2018) smallholder farmers, if they come together, they gain power and other benefits. Concurring with this study finding, one of the key informants had this to say;

*“The problem of our smallholder spice farmers here is lack of cooperation. They can tell you that we are ready for establishing a farmers' organization but in three months to come, they can tell you we are still thinking, but I think the problem of*

*cooperative education among themselves is a challenge. However, we appreciate our fellow stakeholders NGO. It has managed to organize them and soon they will establish spice farmer cooperative union which will be the first one in spice sector in our district”* (Key informant, Ward executive officer, Mtombozi, Morogoro District, February 2021)

Collective action plays a significant role in supporting farmers in marketing. In a collective action, farmers come together with shared resources and may even sell their produce together to protect market price.

#### **2.5.2.11 Value addition facilities**

Lack of value addition facilities was also a challenge noted in this study that faces smallholder farmers in controlling the spice market. Study findings from FGDs held in Lugeni and Mtombozi villages showed that the majority of spices farmers sell their spices without any kind of value addition. It was further observed that some few farmers sell powdered spices such as cinnamon and other mixed spices to the shops, common markets, and to the community members. However, it was further noted that the majority of participants in FGDs sell their spices without value addition due to the following challenges: -

- Lack of capital for buying packing materials.
- Lack of education on value addition
- Lack of technologies such as grinding machines, a chopping machine
- Electricity challenges in some villages

Indeed, these findings concur with that of Hassan (2015) in the study conducted in Zanzibar who reported that smallholder spice farmers were selling their spice without any value addition. According to Vijayalaxmi and Sreepala (2014), the lack of value addition

projects such as agro-processing centers is one of the great challenges in the spice sector. Therefore, entrepreneurship skill for farmers is very important for them to benefit (Kahan, 2012).

#### **2.5.2.12 Storage facilities**

Storage is a market strategy whereby farmers store crops and wait for better future prices. It was noted in FGDs that the majority of farmers had no stores and also there were no warehouses for spices storage in all villages. Concurring with this study observation one of local government official said;

*“We wish if we could have somewhere where farmers could go and keep their spices once dried safely. It is hard here to find spice farmers having good storage facilities. Some have but not that much good for storage. We don’t have such a storage facility in any village in this ward. I think that could be a proper place of which spice business could be done and stop middlemen getting into farms and dictate price”* (Key informant; ward Agriculture field officer, Morogoro District, February 2021).

It was further underscored by FGDs participants in Mtombozi and Lugeni village that having a warehouse would help in controlling and monitoring spices quality as a whole. Also, farmers will be collecting spices at the marketing centers hence reducing exploitation done by middlemen and maintaining standards. In addition, it was suggested in FGDs that warehouses could be used as centers for selling spices to traders. Suggesting to cut the long market chain which leads to poor price to spice farmers. It was reported during FGDs held in Lugeni Village that farmers sell spices directly to the middlemen who dictate price. It was observed that by having warehouses together with related storage

by-laws, farmers may have one voice on spice price. This observation was further emphasized by one key informant who was quoted saying:

*“We thought the issue of warehouses as a storage facility and center for selling our spices could help us. You can see here middlemen are coming as they wish. Farmers have no unity and because of poverty they do accept any price. You cannot stop them because no any village by law. If there could be such warehouse and by law then these farmers could be supported in anyhow”* (Key informant, ward executive officer, Morogoro District, February 2021).

This finding is in line with those by Magreta *et al.* (2010) in the study conducted in Malawi who reported that when farmers are together, they can store their produce and wait for a better price. The study’s observation is also in conformity with findings by FAO (2016) who reported that smallholder farmers are in a good chance of having future profit if they store their produce and wait for a better price.

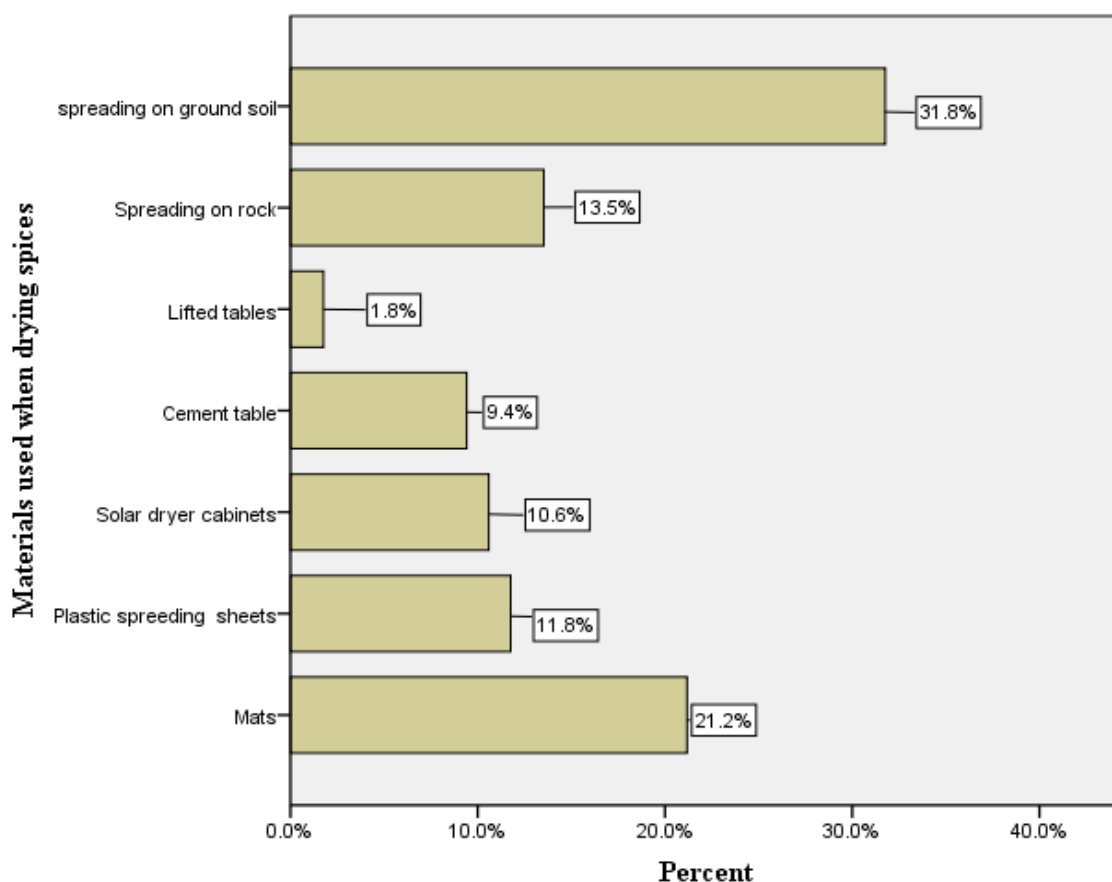
## **2.6 Post-harvest Management Practices**

### **2.6.1 Poor spices drying process**

Study findings presented in Figure 2.2 below, show that majority of spices farmers (31.8% ) dry their spices by spreading on the ground (soil surface). Only 21.2% use mats and 11.8% use plastic spreading sheets. This implies that the methods used by many spices farmers in the study area were ineffective in controlling the quality of spices in terms of moisture content, taste, spices aroma, oil content, and color. Also, the drying practices increase the contamination risk (Plate 1a). This implies that the practices affect the spice quality negatively and thus reduce the ability of farmers to control the spice market. Similarly, a study conducted in India by Bhardwaj *et al.* (2011) showed that spice farmers are encountered sanitation challenges on post-harvest management Furthermore,

during FGDs held in Lugeni village it was noted that some farmers use smoking in drying some of their spices during the rainy season. One participant during FGD held in Lugeni village was quoted saying the following: *“It is a challenge here on how to dehydrate our spice during rainy seasons. It needs someone to be wise, one cannot believe but I should tell that some of few farmers here even use smocking to dry some of the spices because they need fast money. They put spices on top of the place where they are cooking at the kitchen”* (a woman 35 years old, FGD participant, Morogoro District, February 2021).

The study findings reported by Herman *et al.* (2012) showed that buyers always concentrate on quality while farmers concentrate on quantity. The methods and materials used in drying are commonly used in many smallholder spices farmers in Tanzania however some are destroying the quality of spices (ITC, 2014). Spices drying is one of the important processes in maintaining the quality of spices such as aroma, moisture content, oil, and colour, therefore the process should be carefully conducted. Therefore, both private and government sectors need to support smallholder spices, farmers, with affordable technology that would improve the drying process thus improving spice quality and market.



**Figure 2.2: Spices drying materials**

**Source: Field survey (2021)**

### 2.6.2 Poor spices storage

The study results as presented in Table 2.2 below, show that the majority of respondents (78.9%) lack good storage facilities as they store spices in places like the kitchen (21.2%) and living rooms (42.4%), etc. The study observed some smallholder spice farmers were storing spices in living rooms (Plate 1c). The study findings further showed that turmeric spice farmers sell fresh spices, particularly turmeric at the farm gate since they lack materials for dehydration as well the storage facilities. This implies that these poor practices contribute to reducing spice quality and thus increase the challenge in spice market control. The study result was supported by one of the key informants who was quoted saying;

*“They know how spices valuable are, that is why they keep spices inside living rooms. Besides that, we don’t have special stores or warehouses in our villages, if you are not careful sucks can be stolen and sold to the middlemen. Not only in black pepper even dehydrated turmeric. This is why turmeric farmers decide to sell them raw at farm leaving aside the cost of processing whom majority claim to be expensive”* (Key informant, Ward executive officer, Morogoro District, 2021).

Similary, study findings reported by Sharangi *et al.* (2011) showed that spices farmers lack quality of their spices due to poor storage. The study finding is also consistent with that of Mkojera and Chove, (2019) in the study conducted in Tawa ward in Morogoro, Tanzania. Spices are supposed to be stored in a dried and well-ventilated place to maintain their quality (Tesfa *et al.*, 2017). It is therefore important for spices farmers to be trained and supported with storage facilities to ensure spices quality and increase the spices demand and thus attract the market. Spice storage is very crucial in spice quality control for ensuring its market. Lack of good storage and poor storage materials contributes to poor spices quality and poor market.

**Table 2.2: Distributions of respondents by spices storage (n=170)**

Aspects	Number of respondents	Percentage (%)
<b>Storage places (n=170)</b>		
Special store rooms	36	21.2
Kitchen	36	21.2
Living room	72	42.4
Other places	26	15.3

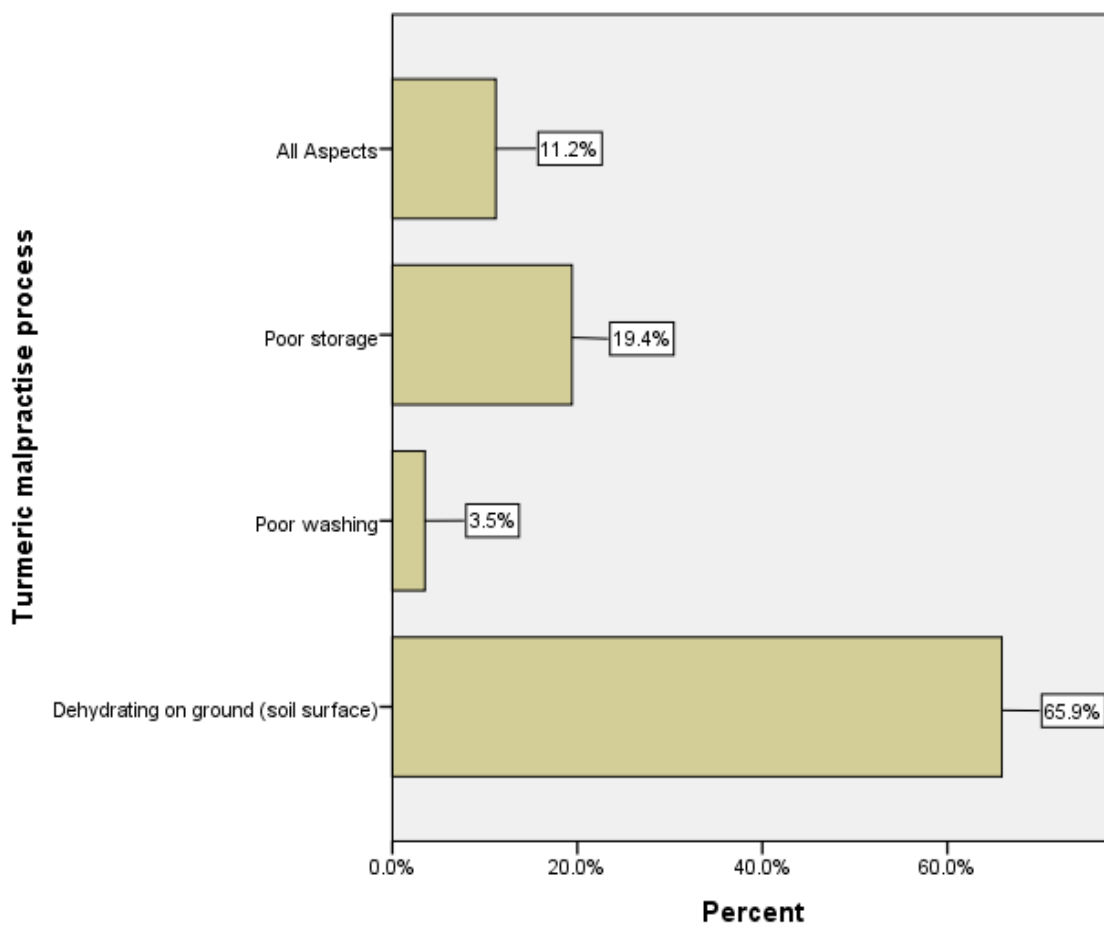
### **2.6.3 Poor Spice Sanitation Practices**

The study finding below (Figure 2.3), shows that majority of respondents 65.9%, especially in turmeric farming, do not adhere to sanitation standards as they dry spices on

the ground (soil surface). They reported the drying process as the poorest practice since the majority dry their boiled turmeric on the ground soil surface (Plate 2.1a). It was also noted during FGDs held in Mtombozi village that poor sanitation has been caused by lack of post-harvest education and a lack of capital for buying materials for maintaining sanitation. One of the participants during FGD was quoted said:

*“It is something that we cannot hide because perhaps you have observed in the streets. The majority of turmeric farmers here dry their spices on soil ground surface. We can say lack of post-harvest education is a problem. But frankly speaking, we don’t have capital for buying good drying materials like nylons sheets”* (a male FGD participant, aged 51, Morogoro District, February 2021)

Sanitation in the post-harvest process helps to ensure spices quality thus creating the better market chance. It involves washing of rhizomes spices such as ginger and turmeric. This suggests the importance for farmers to be well trained on the use of traditional methods and materials available in their environment to adhere to good sanitation practices. Also, it includes proper drying which helps to protect spices from physical and chemical contamination. Some of these traditional methods are the use of lifting tables made by available materials. Again, farmers may organize and support each other during post-harvest activities. Sanitation during post-harvest practices is important for it helps to increase spice quality and attract the market (ITC, 2014).



**Figure 2.3: Turmeric malpractices process**

**Source: Field survey (2021)**



**Plate 2.1: a. Turmeric sun-drying b. Turmeric boiling technology c. Dried turmeric storage place and material used in one of smallholder spices farmer in Mtombozi ward, Morogoro District.**

#### **2.6.4 Lack of spices grading and packing**

Study findings from FGDs revealed that the majority of participants were not aware of the importance of grading. They were not aware on the importance of parking for their spice market control. It was further reported during KIIs that some farmers never sort (separate waste, unmatured spices) due to fear of weight loss of their produce. The above study finding was supported by a key informant who was quoted saying the following:

*“Majority of smallholder farmers never grade their spices, they think the practice would lower the quantity of their products, also there is no any technology here which could support the grading process, this eventually reduces the quality of spices and effect the spice market negatively, however, we are trying to educate them”* (Ward Agriculture field officer, Morogoro District, 2021)

Indeed, these findings are in conformity with study findings reported by Fissiha (2016) in the study conducted in Ethiopia which showed that smallholder farmers lack a good spice market due to the aforementioned factors. Also, (International Trade Centre in Tanzania, (2014) sub-sector spice strategy reported that the majority of smallholder spices farmers in Tanzania do not adhere to the required standards in cleaning, grading, and packing.

### **2.7 Conclusion and Recommendations**

#### **2.7.1 Conclusion**

Based on the study findings, it is concluded that poor infrastructures, lack of proper and reliable source of market information, shortage of enough extension workers and provide extension service which is not market-oriented, lack of spice management committee, lack of collectiveness among smallholder spices farmers, as well as finance constraints and lastly absence of farmers marketing centers and poor spice quality, were challenges faced by smallholder spice farmers in controlling market.

### 2.7.2 Recommendations

Based on the study findings and conclusion above, the following are the recommendations on the improvement of the spice market among smallholder farmers:

- i. The Government through the Ministry of agriculture should improve infrastructures both roads and communication in agriculture production areas. Also, extend grid electricity to all villages. This can be done through the Rural energy Agency (REA) and Tanzania Rural and Urban Roads Agency (TARURA).
- ii. The Government of Tanzania through the Ministry of Agriculture should increase agriculture extension workers and their incentives such as transport facilities such as motorcycles to enable extension workers to provide services to the majority of rural spice smallholder farmers in remote areas.
- iii. The Government of Tanzania through the Ministry of agriculture should make sure agriculture extension service is focused on marketing (market-oriented to farmers, market to farms and not farms to market) instead of concentrating on good farming practices only.
- iv. There is a need for education programs for smallholder farmers on collectiveness and good market information systems. This will help farmers to be aware of the importance of farmers' associations in controlling the market.
- v. There is a need for the government of Tanzania through the Ministry of Agriculture to establish the mechanism of managing the spice sector for the benefit of all players within the spice market chain as it was done in India. This can be possible by establishing the Tanzania spice management board. By establishing the Tanzania spice board, just like other cash crops such as cashew nuts, cotton, tobacco, and coffee, a smallholder in the spice sector will get various benefits such as credit support, training as well market linkage.

- vi. There is a need for the Ministry of Agriculture and other stakeholders to support smallholder farmers with agriculture post-harvest education and technologies. This can be done through collaboration between small industries development organizations (SIDO), agriculture companies, agriculture institutes, and Universities like Sokoine University of agriculture.

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### **CHAPTER THREE**

#### **3.0 DETERMINANTS OF MARKET INFORMATION ACCESSIBILITY AMONG SMALLHOLDER SPICE FARMERS IN TANZANIA. A CASE OF SELECTED VILLAGES IN MOROGORO DISTRICT.**

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### 3.1 Abstract

In Tanzania spice-sub sector is still faced by several challenges, one is the accessibility of market information to farmers. Many smallholder farmers face the challenge of incomplete market information and always depend on traders. This study therefore, aimed at determining socio-economic factors influencing accessibility to market information among small holder spice farmers, a case of selected villages in Morogoro District. The study adopted a cross-sectional research design. Structured questioners were used for collecting quantitative data from 170 smallholder spice farmers at Morogoro District. STATA 16 was used to generate descriptive and inferential statistics. Data were analyzed using descriptive statistics and binary logic regression. Study findings show that variables like electricity availability was statistically significant at  $p < 0.05$ . There was a statistically significant association between electricity availability and access to market information. Therefore, farmers with electricity had an increased likelihood of accessing market information by 1.19109 log odds compared to those without.

.Other variables like sex of respondents, marital status, farm size, annual spice income, gender, transport ownership were not statistically significant influencing accessibility to market information. It is concluded that means of accessing news, education, electricity, and ownership of mobile phones were the only factors that influence access to market information among smallholder spice farmers. It is recommended that the ministry for agriculture in Tanzania and other agriculture stakeholders should strengthen market information systems to smallholder farmers, improve electricity services in rural areas and introduce tax waivers on mobile phones tariffs,

**Keywords:** Smallholder farmer, market, accessibility, market information

### 3.2 Introduction

Globally, accessibility to agriculture market information plays a significant role in supporting the agriculture market. Farmers with access to market information are in a better chance of creating profit than those with no access (FAO, 2016). Accessibility to market information in agriculture has been supported by the advancement in science and technology for example mobile phones, radio, and television. There has been an increase in the use of means of accessing news by farmers in improving their agriculture activities and marketing globally.

Accessibility to market information is one of the important aspects that in one way or another support farmers to be informed on what to plant. It also helps farmers to know where to sell as well as decrease risks in market transactions (Naveed *et al.*, 2014). Literature show when smallholder farmers are accessed with market information increases the chance of improving and increasing productivity (Magesa *et al.*, 2014; FAO, 2018). Accessibility to market information to smallholder farmers is crucial as it helps to improve farmers' economies (Wyche and Steinfield, 2016). According to Zanello and Srinivasan (2014) once the market information is received in a reliable time it helps to increase farmers' bargaining power. Also, it creates an opportunity to engage in a reliable broad market (Kizito, 2011). It is argued that for farmers to access market information, cooperation among market actors in terms of supporting smallholders in technology and, market services are necessary (Magesa *et al.*, 2014). To help smallholder farmers access market information there is a need of strengthening market institutions (FAO, 2016).

In the 90s there was a rapid increase of means of communication such as mobile phones in almost many developing countries (Benzi *et al.*, 2014). In Sub-Saharan Africa, there has been increasing use of means of accessing news by farmers in accessing agriculture

information. However, it is argued that means of accessing news has some challenges for instance, through mobile phone illiterate people can face difficulty in accessing text messages but also phone has some cost implications on their use (Galtier *et al.*, 2014). On the side of the radio program, it depends on the coverage of an area, also most of the radio are used for recreational purposes and less in educational programs. A study conducted in Nigeria showed that rural farmers face several challenges in accessing agriculture information due to lack of electricity, poor Television signals as well poor Radio signals (Obidike, 2011).

In Tanzania, several studies show that farmers have benefited from various means of accessing news (Mtega and Msungu, 2013; Sife *et al.*, 2017). They found that farmers have benefited from the use of radio as one of the popular means of accessing news compared to television which was reported to be used by few farmers. A study by Magesa *et al.* (2014) in Tanzania revealed that 83 percent of rural farmers in remote rural areas depend on radio and mobile phones in information access, agriculture information being inclusive. In a similar study, it was revealed that 75.9 percent use mobile phones in receiving agricultural information including the market. However, similar study shows few farmers use television and newspaper in getting agriculture information. Lack of electricity was reported to be one of the barriers in accessing agriculture information in remote areas (Sife *et al.*, 2017).

On the other hand, socio-economic factors have a great role in supporting individual farmers in accessing market information. Socio-economic factors are such as age of an individual, farm size, farm income, education, sex, gender, and transport facilities ownership. For instance, a study conducted in India (Mittal and Mchar, 2007) as cited by Adewale (2017) showed that age between 20-40 was in high use means of communication such as mobile phones for agricultural use. Ozor and Cynthia (2010) argue that education

as one of the socio-economic factors helps an individual farmer in the acquisition of technology and in making good development decisions.

In Tanzania spice-sub sector is still faced by several challenges, one is the accessibility of market information to farmers (ITC, 2014; REPOA, 2018). Many smallholder farmers face the challenge of incomplete market information and always depend on traders (Aku *et al.*, 2018). There have been various support given by the government and other interested parties to strengthen spice- sub-sector such as the development of spice-sub sector strategy, however, relative less have been achieved, spice market is still a challenge. Furthermore, various studies have been conducted on spices, for example, Mahmoud (2013) conducted a study on the inclusion of small-scale farmers in the spice value chain in Zanzibar whereby the study found poor coordination among actors within the spice value chain. Also, a study conducted by Negera *et al.* (2015) analyzed factors determining the supply of cardamon spice in Ethiopia. Again, a study conducted by Boyal and Mehra (2016) in India analyzed the growth rate of major seeds spice and export performance. In addition, Fundikira (2019) conducted a study on contamination of aflatoxin on marketed spices in Tanzania. Another study was conducted by (Mkojera and Chove, 2019) who explored the safety and quality of black pepper and clove grown organically in Tanzania. Lastly, Hassan (2015) assed factors affecting market access among spice farmers in Zanzibar.

None of number of previous mentioned studies undertaken determined socio-economic factors influencing the accessibility of market information to smallholder spice farmers which is a focus of this study. Therefore, this study aimed at bridging this knowledge gap. This study provides a picture of socio-economic factors how they influence access to market information among smallholder spice farmers. The study findings, therefore,

provide useful information to policymakers and other stakeholders in addressing farmers' challenges and therefore strengthening smallholder farmers' market information systems. Also, supports the attainment of sustainable development goals (SDGs) goals number one and two.

### **3.3 Theoretical Framework**

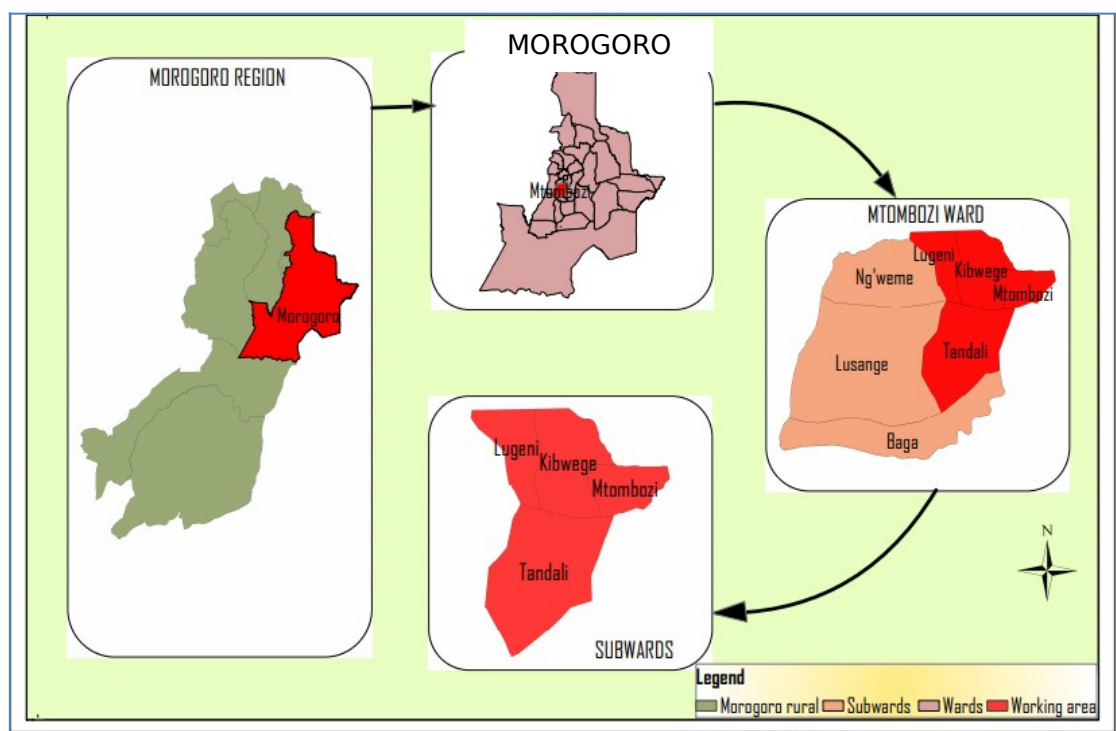
This study was guided by networking theory. Networking can be defined as an ability of an individual or a firm to create interrelationship in a particular context (Hassani, 2015). Networking plays a significant role in the organization or individual products sell (Moeller, 2010). The relation is important in accessing market information. According to Thomas and Thigpen (1993) through networking, society can exchange different information which can create and increase their power as well their decision making. This theory has been chosen in this study since access to market information in most cases is contributed by different factors, some of which are related to networks resulting from relations between individuals and groups. Other socio-economic factors are also of paramount importance.

### **3.4 Research Methodology**

#### **3.4.1 Study area description**

The study was conducted in Morogoro District which is one among six districts of Morogoro region, Tanzania. The region covers 19,056 square Kilometers with a population of 286 248 (URT, 2012). Morogoro district has the following political division, it has 6 divisions, 29 wards, and 214 villages (URT, 2012). This study was conducted in Mtombozi ward in the following selected villages, Mtombozi, Lugeni, Tandali, and Kibwege (Figure 3.1). The study area has a great number of smallholder farmers who engage in spice farming in mainland Tanzania having for instance 641 ha cultivated with clove (URT, 2021). Also, it is an area where stakeholders such as

Sustainable Agriculture Tanzania (SAT) provide production and marketing support to smallholder spice farmers. This is the main criterion for choosing this area. The study area is experiencing an average temperature between 18<sup>0</sup>c on the mountain areas to 30<sup>0</sup>c in valleys. The major economic activities are crop farming both food and cash crops, however, in some lowland areas, indigenous people practice animal husbandry (URT, 2012).



**Figure 3.1: Map showing the position of Morogoro District and selected villages.**

**Source: Author, with support from SUALISA (2021)**

### **3.4.2 Research design and data collection methods**

The study adopted the cross-sectional research design where data was collected once at one point in time. The design helps to save time as it allows data to be collected faster and it is expensive (Neuman, 2014 ). Data was collected using the household survey method using questioners. Before the data collection exercise, data collection tools were pre-tested aimed at ensuring clarity. Smallholder farmers were asked for their concert before

the data collection exercise.

### 3.4.3 Sampling procedure and sample size

A purposive sampling procedure was used to select districts, wards, and villages. The selection criteria for the district, wards, and villages were spices farming engagement and marketing as compared to other areas. Again, simple random sampling was used to select 170 smallholder spice farmers from SAT register and other agriculture offices.

### 3.4.5 Data analysis

Quantitative data collected was analyzed by STATA 16. Both descriptive statistics and regression models were used. A binary logistic model was used to determine socio-economic factors influencing smallholder spice farmers' access to market information. The binary logistic model has been chosen since the response variable (Accessibility of marketing information) is binary with attributes (1=yes, 0 =no). The following is the mathematical notation of the model used

$$\text{logit } y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \xi_i \text{ where by } i=1,2,3, 4, \dots, 9$$

In the binary logistic regression equation above, the letters represent the following:

Logit y is the response variable (dependent variable)

$X_0$  = is the constant term in the model

$X_1$ =Sex,

$X_2$ =Age

$X_3$ =Marital Status

$X_4$ =Education level

$X_5$ =Income

$X_6$ = Means of accessing news

$X_7$ = Family participation in farming

$X_8$ = Electricity availability

$X_9$ = Transport ownership

$X_{10}$ = farm size

$\xi$  = error term (other variables that might affect the model but have not been considered in the model)

$\beta_2, \dots, \beta_k$  are the coefficients of independent variables respectively

### 3.5 Results and Discussion

#### 3.5.1 Respondents' socio-economic and demographic characteristics

Table 3.1 below, shows the socio-economic and demographic characteristics of respondents. The study findings in Table 3.1 below, show that the majority of respondents (61.2%) were male. The study findings further show that females were 38.2%, suggesting that men tend to participate mostly in community activities than females while females concentrate on domestic work. The study finding is inconsistent with the finding by Benson *et al.* (2019) in their study which found that females were higher, engaging in farming than men. It was also revealed that the majority (35.3%) of respondents were between the age of 36-45 years. They were followed by the age group between 46-60 years who were 21.8% of all respondents. This implies that the majority of the study population were labor force in agriculture activities and were at the active age of which influence exchange of information.

Study findings in Table 3.1 below, show that the majority of respondents were married (69.1%). This suggests that the majority of spice farmers had settled permanently engaging in farming activities. The study further shows that 77.6% of respondents had primary education, 8.8% had ordinary secondary education and 12.9% had no formal education (Table 3.1). According to Oduro-Ofari *et al.* (2014) agriculture improvement can be realized only with education, without education good agriculture performance cannot be

achieved. Also, education influences information searching.

On-farm ownership, the study findings below, show that the majority (85.9%) of respondents own one to three acres while those with less than one acre were 1.2%

(Table 3.1). These findings imply that the majority of respondents depend on agriculture as their main economic activity and thus access to market information is necessary for realizing a profit. The study findings further show that only 1.8% of respondents owned six acres and above, suggesting that spice farming is largely practiced in small-scale farming. According to the national annual agriculture report of Tanzania 2021, smallholder farmers occupy 99.4 % of agricultural land while 0.6 % is occupied by larger-scale farmers (URT, 2021). On annual spice income, results show that the majority of respondents (41.2%) had annual spice income ranging between 100 000 TZS – 300 000 TZS (Table 3.1).

**Table 3.1: Socio-economic and demographic characteristics of respondents (n=170)**

Characteristics		Frequency	Percentage (%)
Sex of respondent	Male	104	61.2
	Female	66	38.8
Marital status	Married	118	69.1
	Divorced	13	7.9
	Widowed	8	4.8
	Single	31	18.2
Education Level	No formal education	22	12.9
	Primary school	132	77.6
	Ordinary secondary	15	8.8
	High school	1	0.7
Age Category (years)	18-28	25	14.7
	29-35	27	15.9
	36-45	60	35.3
	46-60	37	21.8
	60 and above	21	12.3
Farm size ( Acres)	1-3	146	85.9
	4-5	12	7.1
	5	5	2.8
	6	2	1.2
	Less than 1	2	1.2
	More than 6	3	1.8
Annual spice income (TZS)	100 000-300 000	70	41.2
	300 000-600 000	38	22.4
	600 000-1 200 000	30	17.6
	1 200 000-1 800 000	11	6.5
	2 000 000 Above	21	12.3

### **3.5.2 The influence of socio-economic factors on accessibility to market information among smallholder spice farmers**

This objective was analyzed by using a binary logistic model where predictor variables were socio-economic factors and the outcome variable was accessibility to market information.

**Table 3.2: The binary logistic regression model showing the influence of socio-economic factors in accessing market information among smallholder spice farmers (n= 170)**

Variable	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval ]	EXP( $\beta$ )
Sex	0.62232	0.4567	1.36	0.173	-0.2727	1.5173	1.863
Age	0.03119	0.0167	1.86	0.062*	-0.0016	0.064	1.032
Education	1.55349	0.0256	2.19	0.029**	0.29233	1.5829	4.728
Marital status	-0.1591	0.2137	-0.7	0.457	-0.5778	0.2597	0.859
Farm size	1.13002	0.7032	1.61	0.108	-0.2481	2.5082	3.096
Annual spice income level	0.19045	0.1595	1.19	0.233	-0.1222	-0.503	1.209
Means of accessing news	-0.5047	0.2379	-2.1	0.034**	-0.9709	0.0384	0.604
Family participation in farming	-0.0567	0.215	-0.3	0.792	-0.4782	0.3648	0.945
mobile phone ownership	1.56713	0.2578	2.98	0.021**	1.29233	2.5829	4.793
Electricity availability	1.19109	0.5685	2.1	0.036**	-0.0768	2.3053	3.291
Transport ownership	0.19202	0.6278	0.31	0.76	-1.0385	1.4225	1.212
cons	-4.3385	2.4574	-1.8	0.077*	-9.1548	0.4779	0.013

From P>z column asterisk \*\* means the level of significance at 0.05 (95%) and \* means the level of significance at 0.1(90%).

From the results above (Table 3.2) the goodness of fit of the model is significant as the probability for the association by Wald chi-square(n-1) between predictor variables and the response variable is lower than the levels of significance used (90% and 95%). This strongly allows the model to be used for interpretation based on the assessment of the influence of socio-economic factors towards accessing market information among smallholder spice farmers.

### 3.5.2.1 Electricity availability

Electricity availability plays a significant role in stimulating economic and social development in many rural communities. Results presented in Table 3.2 above show that electricity availability was statistically significant at  $p < 0.05$ . This suggests that there was a statistically significant association between electricity availability and access to market

information. Therefore, farmers with electricity had an increased likelihood of accessing market information by 1.19109 log odds compared to those without electricity.

Similarly, Magesa *et al.* (2014) in their study conducted in Tanzania reported that smallholder farmers who had electricity were not experiencing a challenge in accessing market information compared with smallholder farmers who had no electricity in rural areas. Again Torero and Barron, (2015) in their study conducted in Ethiopia and El Salvador had similar findings which showed that electricity availability has contributed to access market information. However, Trimble *et al.*, (2016) argued that affordability, reliability, and quality of electricity should also be considered. This means availability of electricity only does not guarantee an individual spice farmer accessing market information other factors need to be considered.

### **3.5.2.2 Means of accessing news**

Means of accessing news as defined in this study refer to facilities that support farmers in receiving news of which in this study was either a farmer owning (Television or radio, sometimes had both or had no). Findings (Table 3.2) above show that means of accessing news was statistically significant ( $P < 0.05$ ) associated with market information accessibility. These results suggest that there was a statistically significant association between means of accessing news and accessing market information. Therefore an unit increase in means of accessing news led to decrease in accessibility of market information by 0.5047 log odds. However, despite being significant, means of accessing news had a negative influence on market information accessibility, this implies that farmers might have their means of accessing news but use them for other things like recreation and not searching market information. The study results are inconsistent with those by Mittal and Mchar (2012) in their study conducted in India who reported the significant association

between owning means of accessing news and accessing agriculture market information. In additional study findings by Chhachhar *et al.* (2012) had shown that farmers with means of accessing news had a better chance of accessing market information than those who do not own. However, despite being significant, owning means of accessing news only does not guarantee an individual smallholder farmer being accessed with market information other factors should be considered.

### **3.5.2.3 Age of respondents**

Age in one way or another influences an individual effort of accessing information. Results, as presented in Table 3.2 above, show that the age of respondents was statistically significant ( $P < 0.1$ ) associated with accessibility to market information. This suggests that there was a statistically significant association between the age of respondents and accessing market information. This is probably true as the age group between 36-45 is in a better chance of accessing market information by 0.03119 log odds compared to other age groups due to their knowledge on the use of modern communication tools like phones. This might also be true due to the fact in this study that the respondents with age group range between 36-46 years were active age group in production with high level of interaction, contrary to that age class of 60 and above who probably not accessing market information due to their low level of interactions and know-how on the use of modern tools of communication.

### **3.5.2.4 Level of education**

Education is one of the important key determinants of individual skill and knowledge that enable in acquiring different information. Level of education was measured by using binary logistic regression looking whether none or primary education, Ordinary secondary education, high school, as to whether education factor was influencing the accessibility to

market information. The study findings Table 3.2 above show that the predictor level of education was statistically significant ( $P < 0.05$ ) associated with accessibility to market information. This suggests that there was a statistically significant association between individual level of education and accessing market information. Therefore, results further imply that as an individual increasing level of education also increases the accessibility of market information by 1.55349 log odds compared to those with a low level of education. Suggesting that education can enable an individual to create information networks that support accessing market information. However, Adewale (2017) in the study conducted in Nigeria which reported contrary findings where level of education was not statistically significantly influencing accessibility to market information. Also, Magesa *et al.* (2014) argue that illiteracy affects an individual farmer in accessing agriculture market information.

#### **3.5.2.5 Mobile phone ownership**

Mobile phones ownership is important and used by many people in developing countries to access information. A binary logistic regression model was used to determine the influence of mobile phone ownership on the accessibility of market information. The study findings presented in Table 3.2 above show that mobile phone ownership by the farmer was statistically significant ( $P < 0.05$ ) associated with accessing market information. Therefore, this suggests that an individual farmer who had mobile phones had a chance of accessing market information by 1.56713 log odds compared to those who were not owning mobile phones.

This finding conforms with study findings reported by Adewale (2017) in a study conducted in Nigeria which showed that the use of the mobile phone by farmers influenced accessing market information. However, it is argued that the use of the mobile

phone in accessing information has some challenges one of them is that of illiteracy since some people can face difficultness in accessing text messages but also phone has some cost implications on their use (Galtier *et al.*, 2014).

On the other hand, the study findings as shown in Table 3.2 above show that other variables like sex of respondents, marital status, farm size, annual spice income, family participation in farming, and transport ownership were not statistically significant ( $p < 0.05$ ) influencing accessibility to market information. However, two variables annual spice income and farm size had a slight influence on accessing market information but were not statistically significant.

### **3.6 Conclusion and Recommendations**

The study concludes that electricity availability, means of accessing news, level of education, mobile phones ownership, and age influenced inaccessibility to market information. Accessibility to market information among rural farmers is important as it helps farmers be informed with reliable market information, increases their bargaining power, and increases the chance of improving productivity. It is therefore recommended that the government of Tanzania and other stakeholders should make sure smallholder farmers are connected with grid electricity in remote areas and introduce tax waivers on mobile phones to support farmers. Also, it is recommended that stakeholders should establish market information programs such as radio programs and educate farmers on their importance. Lastly, it is recommended that government and stakeholders in Tanzania should establish a strong market information system for smallholder farmers that would enable them to access market information and eventually improve spice market performance.

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## **CHAPTER FOUR**

### **4.0 CONCLUSION AND RECOMMENDATIONS**

#### **4.1 Summary of Major Findings**

Below is a summary of major findings

##### **4.1.1 Challenges face smallholder spice farmers in controlling the market**

Objective one examined challenges faced by smallholder spice farmers in controlling market. The study findings from content analysis and descriptive analysis revealed the following as challenges faced by smallholder spice farmers in controlling market which were poor infrastructures, lack of proper and reliable source of market information, shortage of enough extension workers and provide extension service which is not market-oriented, lack of spice management board/ committee, lack of collectiveness among smallholder spices farmers, as well as finance constraints and lastly absence of farmers marketing centers and poor spice quality, resulted from poor post-harvest practices.

##### **4.1.2 Smallholder spice farmers' farm management practices that affect the spice market**

Objective two examined farm management practices that affect the spice market. The study findings from descriptive analysis and content analysis revealed that poor farm management practices such as poor drying practices, poor sanitation, lack of packing and grading, poor technology affected negatively smallholder farmers in controlling the spice market.

#### **4.1.3 Determinants of market information accessibility among smallholder spice farmers**

Objective three determined socio-economic factors influencing market information accessibility among smallholder spice farmers. Generally, the study findings from binary logistic regression revealed that electricity availability, means of accessing news, level of education, mobile phones ownership, and age significantly influenced accessibility to market information while other variables sex of respondents, marital status, farm size, annual spice income, gender issues, transport ownership did not show significant influence on accessing market information.

#### **4.2 Conclusion**

This study aimed at examining challenges faced by smallholder spice farmers in controlling the market. The study findings from content analysis and descriptive analysis revealed that lack of farmers' collective actions, poor transport and communication infrastructures, inadequate extension services, limited credit support to farmers, absence of marketing centers, weak legal support, lack of spice management committees/board, and poor post-harvest agriculture practices conducted affected negatively the spice market control. Furthermore, the study concludes that access to market information in the study area among smallholder farmers was influenced by age, education, electricity availability, means of accessing news, and ownership of mobile phones. It is therefore suggested that the government and other stakeholders should improve the market information system, rural electrification and overcome mobile communication challenges in rural areas. Lastly, it is concluded that post-harvest practices used by farmers were ineffective in controlling the market. The policy implication of the study is that the government of Tanzania and other stakeholders should pull their efforts towards improving market information system to smallholder farmers, improve access to credit, improve extension

services that are market-oriented to farmers, initiate marketing management within the spice sector by establishing Tanzania spice board, improve infrastructures in rural areas to reduce transactional cost and thus, improves smallholder spice farmers bargaining power.

### **4.3 Recommendations**

Based on the study findings, it is recommended to the government and other stakeholders as follows;

- i. The Ministry for Agriculture should establish a spice management board and committees. This will regulate the spice sector which is of great importance to the livelihood development of smallholder spice farmers.
- ii. Agriculture stakeholders should support spice farmers with the establishment of spice farmers organizations. These are such as cooperatives in order to enable them to have collective actions for market control.
- iii. The Government of Tanzania should improve roads, electricity, and communication infrastructures in rural areas to support smallholder farmers with easily transportation and reliable market information. Also, by improving rural roads through Tanzania Rural and Urban Roads Agency (TARULA), smallholders' bargaining power will be strengthened.
- iv. Financial Institutions such as Banks should support smallholder farmers with friendly credit schemes. This can help spice farmers access credit that will support them owning various post-harvest technologies such as turmeric boilers, threshers and magnetic vibrators. This will contribute to the improvement of spice quality thus smallholder farmers will be able to control the market. This can also be done through collaboration between agriculture stakeholders such as SIDO, agriculture Institutes and Universities like SUA.

- v. The Ministry for Agriculture should strengthen the marketing system such as having one marketing spice selling centers, this will cut down long marketing chain which deprives farmers of getting a good price. Again introduce tax waivers in mobile phones. Also, should improve the market information system to enable smallholder farmers be aware of the current spice price.

#### **4.4 Area for Further Studies**

This study focused on challenges faced by smallholder spice farmers in controlling the market. Future research can be done on the contribution of spice farming to the livelihood development of rural people which this study didn't focus on.

## APPENDICES

### Appendix 1: Smallholder spice farmer questioners

#### Respondents' General information

1.	Questionnaire number	
2	Village Name	
3	Ward	
4	District	
5	Household relationships of the respondent.	1. family member 2. Husband.3. Spouse

#### A. Social-economic and demographic characteristics of the respondent.

6. Sex of the respondent (Tick v), (1) Male (2) Female (    )

7. Age of respondent, how old are you? .....

8. Level of education of respondent. 1. Non 2. Primary school 3. Ordinary secondary school 4. High school 5. Tertiary education 6. Diploma 7. University. (    )

9. Marital status of respondent 1. Married 2. Single 3. Divorced 4, Widower 5. Widowed (    )

#### B. Other socio-economic factors influencing access to market information.

10. How is the size of your farm? 1. 1-3 Acre 2. 4-5 Acre 3. 5 Acre 4. 6 Acre 5. More than 6 Acre 6. Less than 1 Acres (    )

11. Do you have any other income activities apart from spice farming?

1. Yes 2. No If yes, go next question (    )

12. What are those other income-generating activities

1. small business 2. Formal employment 3. Poultry 4. Livestock keeping

5. Transport service. (    )

13 Which among the following do you depend mostly on for sustaining your family?

1. Farming activity 2. Off-farm activity. 3. Remittance ( )

14. What is your spice average annual income?

1. Tsh 100 000-300 000 2. Tsh 300 000- 600 000 4.600 000- 1200,000 5 Tsh

1200 000-1800 000 6Tsh. 2 000 000- Above ( )

15. What do you own among the following /in accessing market information

1. TV 2. Radio 3, Both 4. None ( )

16. What is the most challenge which faces you in market searching?

1. Information 2. networking. 3. others (specify)..... ( )

17. Do you own a mobile phone? ( )

1. Yes 2. No

18. Who participates mostly in spice farming in your family?

1. spouse 2. Husband 3. All family ( )

19. Is your house connected to electricity?

1. Yes 2. No ( )

21. When coming to household farm income who is the final decision maker and participate in farming?

1. Husband 2. Wife. 3. Both ( )

22. Do you access market information well? 1. Yes 2. No

23. Do you own any means of transport? ( )

1. Yes 2. No,

24. If yes what kind of transport do you own for farming/marketing support? ( )

1. Bicycle 2. Motorcycle 3. None

## **Appendix 2: Checklist for questionnaire Guide for smallholder spice farmers**

**investigating post-harvesting management and practices.**

**Village Name..... Respondent NO.....Mob.....**

### **CHALLENGES FACED BY SMALLHOLDER SPICE FARMERS IN**

#### **CONTROLLING MARKET: AGRICULTURE MANAGEMENT PRACTICES**

1. What kind of spices do you grow at your farm?

1. Cardamom 2. Cinnamon 3. Turmeric 4 Black pepper 5. Clove 6. Vanilla.

7. Ginger 8. Mixed species, Mention..... ( )

2. Are you being faced with spice pest/diseases challenge?

1. Yes 2. No if yes can you mention..... ( )

3. How do you control spices plants against pests and disease?

1. Local materials like herbs 2. Insecticides 3. None ( )

4. Have you ever received education on good farming practice for the last one year?

1. Yes 2. No. . ( )

5. When do you harvest your spice, do you harvest during the rainy season?

1 Yes 2. No. ( )

6. Have you ever been taught/trained on spices standards adherence?

1. Yes 2. No ( )

7. Which method of drying spices do you use after harvesting

1. Drying on sun 2. Smoking 3. harvesting and leaving them to dry. 4 contact drying

( )

8. Which material do you use when drying your spices in the sun?

1.Spreading cemented table 2. Spreading on plastic sheet 3. Solar dryer cabinet 4.

Spreading on rock surface 5. Spreading on Ground soil 6. Spreading on mats 7.

Spreading on lifted table ( )

9. Is there any bad practice used by farmers that you know helps to increase spice weight before selling?

1. Yes 2. No ( )

10. Do you know the effects of moist in the spice once left after being harvested?

1. Yes 2. No, ( )

11. Have you ever heard about aflatoxins, its effect, and how to overcome them?

1. Yes 2. No ( )

12. Have you ever attended any training on post-harvest management?

1. Yes 2. No ( )

13. Have ever been trained on technological use on spices standards maintenance?

1. Yes 2. No if yes, can you mention ( )

14. Do you know storage has to do with quality control and maintenance of spice?

1. Yes 2. No, ( )

15. Where do you store your spices?

1. special storeroom 2. Kitchen 3. Leaving room 4. Others (specify) ( )

16. What do you do in making sure your product is not affected by pests during storage?

1. Adding preservative 2. Drying them (moist control) 3. store fumigation  
4. Non ( )

17. Have you ever received extension services on spice marketing and post-harvest management by extension officers?

1. Yes 2. No ( )

18. Do you get any spice marketing training from anywhere?

1. Yes 2. No ( )

19. Do you know the importance of Grading?

1. Yes 2. NO ( )

20. Do you grade your spices before selling them to buyers?

1. Yes    2. No        (        )

21. Do you think harvesting before maturity is done by spice farmers in this village?

1. Yes    2. No    (        )

22. What is the major poor post-harvest practices done by spice farmers in turmeric in this village?

1 Drying on the ground    2. Poor washing    3. poor storage    4. All aspects    (        )

23. What is the major poor post-harvest practices done by spice farmers in black pepper in this village?

1. Drying on the ground    2. Adding unwanted materials    3. both    (        )

4. Other (Specify) .....

### **Appendix 3: Checklist for Key informant interview Guide for Village Executive**

**Officer/Village chairman.**

Date....., Place.....Time.....

#### **CHALLENGES FACED BY SMALLHOLDER FARMERS IN CONTROLLING MARKET**

1. How does the Village government support spice farmers? Is there any law that protects them against middlemen exploitation?
- 2 What is your Village doing in ensuring the spice market is available? Is there any regulation that supports spice farmers?
3. When middlemen and companies get in the Village for spice buying are there any contracts follow up by Districts to make sure farmers are not oppressed?
- 5.How often does your office conduct a meeting with spice farmers? Was there any meeting with the higher Authority for farmers' challenges?
6. How many agricultural extension officers are you having in village?
7. With regards to the number of spice farmers, are extension officers satisfactory in this village?
8. How do you help spice farmers especially women and youths to get financial support from District Level?
9. Do you think having spice management boards and cooperatives matters? How?
10. What can you talk on the accessibility of market information to farmers?

Do you have any opinion?

***Thank you.***

#### **Appendix 4: Key informant interview checklist for DAICO: Challenge face**

##### **smallholder farmers in controlling the market**

**Date of interview** ..... /..... /2021

**Name of respondent**..... **Position:** .....

- 1) How can you talk about spice marketing in your District?
- 2) Specifically, how is specific marketing in Mtombozi Ward?
- 3) How does District assist spice farmers in getting market? Explain. Can you mention NGOs and Companies supporting farmers?
- 4) Is there any regulatory or management board in District which controls spice marketing? Can you explain
- 5) Are there spice farmers marketing centers? If yes ,how are they supporting farmers. If not why?
- 6) Are you having enough human resources (Extension officers) specialized in horticulture in all wards and villages?
- 7) Is there any extension program which support spice farmers in marketing? Can you explain them and how they benefit spice farmers in marketing? And how is coordination?
- 8) How can you talk on the role of the Council in supporting spice farmers' market?
- 9) How financial constrains is challenge in supporting spice farmer's coordination?
- 10) How are infrastructures ie roads and telecommunication networks in spice farms?
- 11) How does your office supporting spice farmers in terms of trainings?

***Thank you for your cooperation***

## **Appendix 5: Key informant interview Guide: Traders dealing with spices**

**Name .....** **Place.....** **Date.....**

### **Research Title; CHALLENGES FACED BY SMALLHOLDER SPICE FARMERS IN CONTROLLING MARKET.**

- 1) What can you talk about spice business?
- 2) What challenge do you face in spices business on farmer's side?
- 3) What obstacle are facing when making business with spice farmers? from District to village.
- 4) Do you face any intermediation on the roads to spice farmers?
- 5) What is major challenge currently facing spice business which affect buying farmers' spice? from Mtombozi ward?
- 6) Are there any imported spices sold by traders? can you mention them, Companies and Countries being imported
- 7) How is the buying price of imported spices from outside Tanzania ie from India cardamom, cinnamon, turmeric, black pepper, cloves from Agents/whole seller?
- 8) What can you talk on their strength and weakness as compared to the locally produced from Mtombozi ward? In terms of quality.
- 9) What are the general challenges in spices business when dealing with farmers?

***Thank you.***

**Appendix 6: Key informant interview checklist for Ward/Village Agriculture field officer**

**TITLE; CHALLENGES FACED BY SMALLHOLDER FARMERS IN CONTROLLING MARKET**

**Date of interview** ..... /..... /2021

**Name** ..... **Position:** .....

- 1) How can you talk of spice farming in your ward?
- 2) How farmers practice post-harvest practices in your ward?
- 3) a) Are there any challenges related with post-harvest practices?  
b) What measures is your office taking to support farmers
- 4) What challenges are you encountered in provision of extension services to farmers
- 5) How does your office manage spice marketing? is there any committee?
- 6) How is coordination and cooperation among stakeholders who support farmers with marketing?
- 7) Do spice farmers grade their produce? And what are the challenges on this?
- 8) How is storage condition by farmers? Is there any place where farmers safely store their produce?
- 9) How do you support farmers with extension service in spice marketing? How many agriculture extension workers do you have?
- 10) How is price information disseminated to farmers? Which sources to they use to receive market information?

**Appendix 7: Key informant interview checklist for Community development officer.**

**TITLE; CHALLENGES FACED BY SMALLHOLDER FARMERS IN  
CONTROLLING MARKET**

**Date of interview** ..... /..... /2021      **Name** .....

- 1) Is your department having special Loans/credits for women, youths and people with Disability, if yes, how does it support spice farmers? is there amount of loans that were given to spice farmers from 2015-2019?
- 2) How does spices farmers benefit from Loans for value additional of their produce?
- 3) Is there any Agro business training which evolved spice farmers ever conducted for the past one year? If yes, what were the topics and number of beneficiaries from Mtombozi ward?
- 4) How many spice farmers registered groups are you having, from 2015-2019.?
- 5) Can you explain their names, place they come from and kind of spices produced, members?
- 6) How can you talk of market information to farmers? What challenges do the farmers face in accessing information?
- 7) Have you ever linked and coordinate spices farmers from wards with economic empowerment bodies? Such as SIDO, Banks.etc
- 8) Is there any regulatory body which organizes spice farmers together in District?
- 9) How do you cooperate with NGOs in supporting spice farmers in terms of marketing and trainings? How is the coordination.

***Thank you for your cooperation***

**Appendix 8: Observation guide on post-harvest management**

**TITTLE: CHALLENGES FACED BY SMALLHOLDER SPICE FARMERS IN  
CONTROLLING MARKET**

- 1) Technology used in by farmers if any
- 2) Storage of spice done by spice farmers
- 3) Stores used, store condition and sanitation
- 4) Drying process done by farmers
- 5) Materials used to keep spices after being dried.
- 6) Facilities/materials used by farmers in washing spices and drying.

### Appendix 9: Focus group discussions guide

	FGDs Research questions	FGDs probing questions
1	What are the major challenges faced by smallholder spice farmers controlling market?	Can you tell the causes of these challenges?
2	How do you control post-harvest challenges, ie Drying	Can you tell some of practices which are not good in post-harvest but they are practiced by farmers?
3	How is cooperation among yourself in controlling spice market?	Are there some effects resulted from such situation?
4	Do you practice contract farming /business?	Are there some spice farmers engaging in such contracts? what are the positive and negative effects?
5	How is financial support in your agricultural activities?	Are there some challenges in this?
6	What projects are you dealing with for extra income generation?	What are the challenges? Can you explain
7	How many many spice farmers groups are you having in this ward ?	Do the groups sell their spices collectively?
8	Is there any spice cooperative society in this ward or district?	How important can it be in controlling market?
9	Where and how spices storage is done?	Are you having special storage place/warehouse for spices?
10	How can you talk on spices quality in relation to market ?	How do you deal with quality management?
11	How can you talk of market information?	What are the source your market information?

*Thank you for your cooperation*