

**SPICES PRODUCTION AND HOUSEHOLD INCOME IN MOROGORO
RURAL DISTRICT**

BY

NYAMWERU FAUSTINE GWASSA

**A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE DEGREE OF MASTERS OF ARTS IN RURAL
DEVELOPMENT OF SOKOINE UNIVERSITY OF AGRICULTURE.
MOROGORO, TANZANIA**

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ABSTRACT

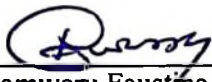
This study was conducted in Morogoro Rural districts in Tawa and Kibogwa wards, which were purposively selected to examine contribution of spice production to the farmers' income. Forty respondents were purposively selected in three villages purposively selected in each ward based on involvement in spices production. Results showed that the main types of spices cultivated were Black pepper, Cloves, Cinnamon, Cardamom, Ginger and Vannila, which were cultivated as either intercrop or monocrop. Other crops included; bananas, fruits and cassava. Though not significant at 95% confidence interval ($P = 0.056$) spices contributed 39% of mean household cash income per season, which was slightly higher than that for other crops. The corresponding values for bananas, cassava and fruits were 28%, 22% and 11%, respectively. Incomes from spices were important for several economical and social demands such as house construction, purchasing assets, payment of school fees and buying food during time of food shortages. In Kibogwa ward, the major constraints to spice production were lack of extension services, lack of capital and unstable prices reported by 33%, 13% and 8% of the interviewed households, respectively. The corresponding values were 27%, 22% and 18% of interviewed households in Tawa ward. Improved road networks to facilitate extension services delivery and transport to market centres, informal and formal credit facilities are recommended for improved and profitable spice production.

ABSTRACT

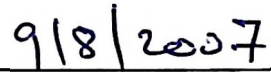
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DECLARATION

I, NYAMWERU FAUSTINE GWASSA, do hereby declare to the Senate of Sokoine University of Agriculture that this dissertation is my own original work and that it has not been submitted to any other University for award of a degree.

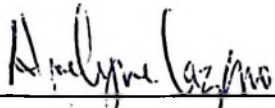


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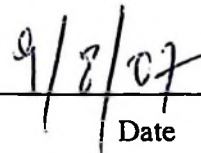


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The above declaration is confirmed



Dr. E. A. Lazaro
(Supervisor)



Date

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LIST OF ABBREVIATIONS

BET	Board of External Trade
FGDs	Focused Group Discussions
GDP	Gross Domestic Product
HVAPs	High Value Agricultural Products
LDCs	Least Developed Countries
MAFC	Ministry of Agriculture, Food Security and Cooperatives
SACAS	Savings and Credit Associations
SACCOS	Savings and Credit Cooperative Societies
SSPS	Statistical Package for Social Sciences
UMADEP	Uruguru Mountains Agricultural Development Project
URT	United Republic of Tanzania
ZSTC	Zanzibar State Trade Corporation

CHAPTER ONE

1.0 INTRODUCTION

In centuries gone by, spices were big business and one of the main reasons for the pioneering of the word trade. The outstanding spices of the past were cinnamon, clove, nutmeg, pepper and ginger, all of which have been known to man and highly valued since earliest times. Cinnamon was the most ancient of all the spices (Lownberg, 1968). Cloves and nutmeg were at one time worth their weight in gold; a pound of cloves would buy a cow; a pound of ginger was the same price as a sheep; a sack of pepper was worth a man's life (Lownberg, 1968).

Spices have dramatically influenced the course of history over time. Known to have provoked wars spices have built and destroyed empires, as countries vied to win control over their production (Rehm, 1984). The spice trade has had a decisive effect on politics and was the main reason for beginning of the European interest in Africa and Asia (Pulsiglove, 2005). Even nowadays, spices still play an important role both in national economies and daily life in many countries and are still a key ingredient in every kitchen cupboard. The world market for spices and herbs is valued at 2.3USD billion. From 1995 to 1999 imports averaged 500 000 tones growing at an average of 8.5% (BET, 2002).

The spices not only bring foreign exchange to the developing countries, but because their cultivation and processing are very labour intensive, they also substantially improve the labour market (Rehm, 1984). Because it is increasingly common for technical processing to take place in the countries of production they give a further motivation for development of local industries Pulsiglove (1968).

In Tanzania spice-industry is a distinct sector with a fast track export potential requiring only low level of investment (BET, 2002). Spice production is mainly carried out in areas with tropical and sub-tropical climates such as Tanga, Morogoro and Zanzibar. (BET, 2002). Available data for spice industry indicates that overall the sector has been growing by more than 10% per annum in value terms since 1997. The actual export value grew from USD 1 148 000 in 1997 to USD 11 000 000 in 2001 (BET, 2002).

1.1 Problem statement

Spices have been produced in Morogoro rural areas and have contributed significantly to rural livelihoods. However, spices have continued to receive minimal recognition by the Ministry of Agriculture, Food and cooperatives (MAFC) as constituting a special sector. These in turn have denied spices the attention accorded to other cash crops such as tea, cotton, cashew nuts and pyrethrum. In the year 2001/2002-budget speeches by the Minister of Agriculture, spices were lumped together with other crops (BET, 2002). However in the year 2006/7 budget speech The Minister has admitted the fact that in order to cope up with diminishing prices at the world market for traditional cash crops more emphasis should be placed on high value agriculture products such as, vanilla, paprika, flours, pepper and cardamon.

Morogoro rural district is one of the major spices producing areas in the country, others being Tanga region and Zanzibar. Spices production in these areas is basically for local consumption and for sale. Thus, farmers have been earning incomes from spices for quite so long. Despite of the spices have a significant contribution to household's livelihoods; no studies have been carried out to establish the extent at which the spices contribute to

the household incomes and livelihoods in general. Lack of data has led to less attention and appreciation by many parts and the Government. This is exemplified by having no system dedicated to the training of producers and exporters of spices. Consequently very little, if any technical assistance, incentive and motivation have been offered to farmers who have been growing spices. Therefore, the study was aimed at examining the overall contribution of spices to household income. It tried to assess the production chains and marketing processes and found out the extent to which spices contribute in poverty reduction especially in the study areas.

1.2 Justification of the study

In Tanzania spices constitute an important group of agricultural products. The spice industry presents a major opportunity for Tanzania to exploit and reap economic benefits in relatively short term with only minimal inputs/investment and attention. The study findings form a basis for policy formulations for improving the overall production of the spices. Again, information on potential of the sector in improving rural livelihoods, production and marketing constraints will contribute to formulation of strategies to solve such problems and improve the farmers' welfare. It therefore becomes apparent that, findings from this study will assist the planners, policy makers to accord due priority to spices production and its promotion to other areas of the country.

1.3 Objectives of the study

1.3.1 General objective

The overall objective of this study was to examine the importance of spice production to the farmers' livelihoods.

1.3.2 Specific objectives

The specific objectives of the study were to:

- (a). Identify spice production systems in Morogoro rural district.
- (b). Determine the contribution of spices to the overall household income.
- (c). Identify the spices marketing systems in Morogoro rural district.
- (d). Identify factors influencing the growth of spices sector in production areas.

1.4 Research questions

The study tried to get answers for the following questions;-

- (a) What kinds of production systems are employed in spices production in Morogoro rural district?
- (b) What are the marketing channels, systems and potentials for spices in Morogoro rural district?
- (c) What are major seasonal patterns and methods of marketing transactions in Morogoro rural district?
- (d) What are the main factors that influence improvement/stagnation on growth of the spice sector in the production areas?

1.5 Conceptual framework

In an attempt to put this study in context, the conceptual model illustrated in Fig. 1 was conceived.

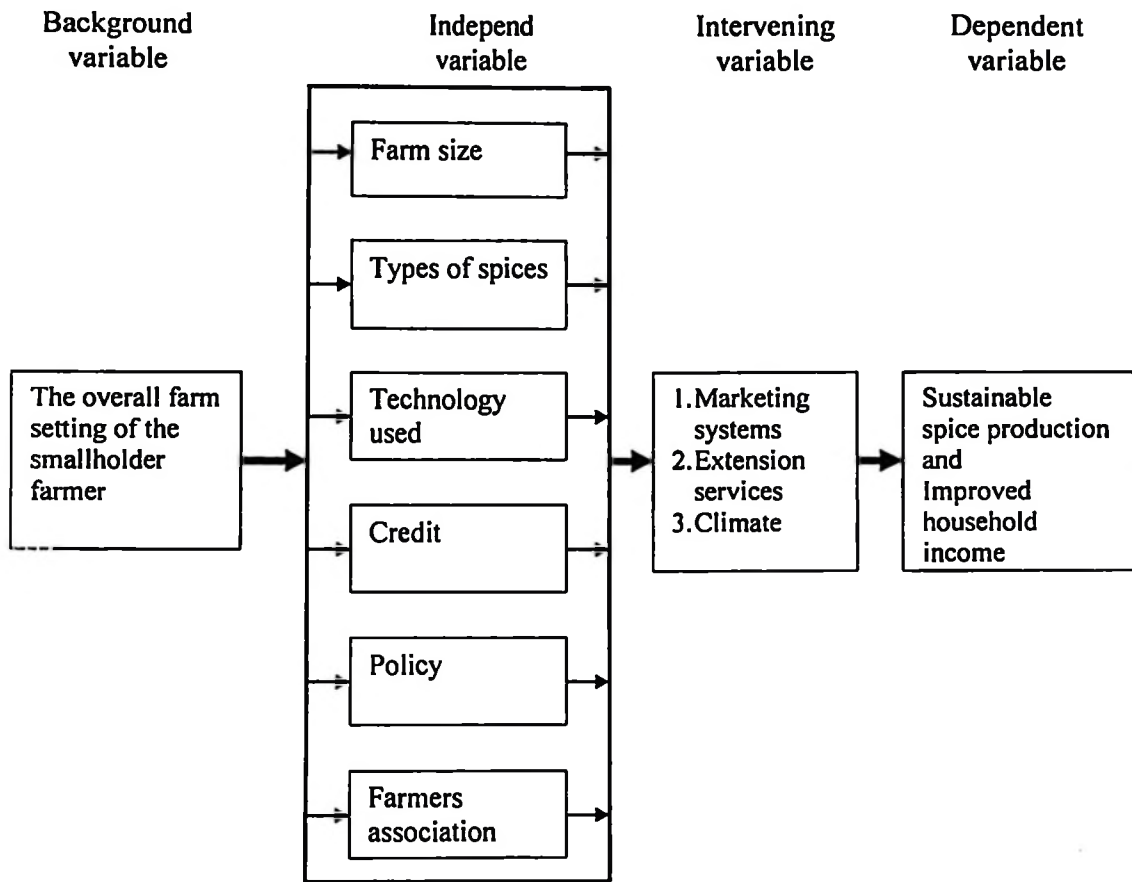


Figure 1: Conceptual framework of the study

The dependent variables, which is the process of spice production and the resulting household income is explained by the dynamics of independent variables which include farm size, types of species grown, technology employed, availability of credit facilities, membership in farmers association and micro and macro policies. There are other forces responsible for determining a set of independent variables characterising a given household. These forces can be collectively referred to as background variables and they constitute overall farm setting, which include but not limited to education level, wealth

status and land ownership. Furthermore, there is a set of intervening variables that influence the way background variables and independent variables interact to manipulate the way a given spices are produced in a given household and household income resulting from spices production.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Agriculture sector in Tanzania

Tanzania's agriculture sector constitutes over 50% of national GDP and provides a majority of the country's export earnings (Mugenyi, 2000). Since 1980s the Government has withdrawn from direct involvement in production, processing, and marketing activities and has retained only its role in setting policies. Traditional export crops include coffee, cashewnuts, tobacco, and cotton, although efforts are being undertaken to promote non-traditional crops such as spices, horticultural items, and oilseeds. Unfavourable international prices integration for most of exported crops have discouraged farmers, some of whom have now shifted to production of other crops such as oilseeds, spices, fruits and vegetables (Mugenyi, 2000).

2.2 Current world market for spices

According to International Trade Forum (2001) the world market for imported spices and culinary herbs are large, valued at just over US\$ 2.3 billion. Least Developed Countries (LDCs) such as Madagascar, Comoros and the United Republic of Tanzania earn a substantial part of their foreign exchange from spice exports. The main spices exported by LDC countries are vanilla, cloves, chillies, cardamoms, nutmeg and mace. Since 1995, the LDCs have provided over half of the world's imports of vanilla and over one-fifth of the world's demand for cloves. Other major LDC exports include black pepper, paprika, coriander, cumin, cinnamon, ginger and turmeric. From 1995 to 1999, annual world imports of spices averaged 500 000 tones, growing at an average 8.5% a year.

The LDCs have tremendous potential to expand their spice exports to both developed and developing countries markets. The spice markets are growing rapidly and LDCs have the natural resources to compete. They are likely to benefit from the rapid growth of the market, could take market share from their developing country competitors, add to the range of spices and herbs they supply, and increase value addition by preliminary processing. But despite growing world imports, LDCs have not performed well in recent years with exports of spices. Over the period from 1995 to 1999, total exports from LDCs decreased by 8.5% in quantity and 4% in value (International Trade Forum, 2001). There were two major reasons: the severe drop in world vanilla prices following an oversupply situation in Indonesia and the bad climatic conditions in several producing countries in Africa in 1998 and 1999.

2.3 Current situation of the spice sector in Tanzania

2.3.1 Areas growing spices

Spice production in Tanzania is predominantly by small-scale farmers located in areas with tropical and sub tropical climate and generally use no chemical fertilizers (Table 1) (BET, 2002). In Tanzania, Zanzibar dominates spice industry mainly cloves and other clove by-products. Spice farms on Zanzibar are grown as homegardens, with trees, shrubs and grasses all grown together in a shade of mango and jackfruit trees. There are also commercial monoculture farms which produce and market certified organic spices from large-scale farms as well as out grower small farmers.

Table 1: Spice producing areas in Tanzania

Common name	Scientific name	Swahili name	Production area	Potential area
Cardamom	<i>Elettaria cardamom</i>	Iliki	Tanga, Kilimanjaro, Zanzibar	Iringa, Kagera
Ginger	<i>Zingerber officinale</i>	Tangawizi	Mbeya, Morogoro, Coast, Tanga, Morogoro, Kigoma	Kagera
Turmeric	<i>Curcuma domestica</i>	Binzari	Mbeya, Kilimanjaro, Tanga, Kagera, Kilimanjaro, Morogoro, Zanzibar	Coast
Cinnamon	<i>Cinnamomum verum</i>	Mdalasini	Tanga, Morogoro, Zanzibar	Coast
Garlic	<i>Allium sativum</i>	Tunguu swaumu	Arusha, Mbeya, Singida, Morogoro	Iringa
Black pepper	<i>Piper nigrum</i>	Pilipili manga	Morogoro, Tanga, Zanzibar	Mbeya
Clove	<i>Syzygium aromaticum</i>	Karafuu	Morogoro, Zanzibar, Tanga	Coast, Dar es Salm
Chilli	<i>Capsicum frutescens</i>	pilipili	Arusha, Coast, Tanga, Zanzibar	Iringa, Morogoro
Onion	<i>Allium sepa</i>	Kitunguu maji	Iringa, Arusha, Morogoro, Singida, Dodoma	-
Vannilla	<i>Vannila fragrans</i>	Vanila	Kagera, Zanzibar	Mbeya, Morogoro, Coast
Cumin	<i>Cuminum cyminum</i>			
Coriander	<i>Coriandrum sativum</i>			
Paprika			Arusha, Iringa, Mbeya	Kilimanjaro
Mustard	<i>Brassica nigra</i>		Arusha, Kilimanjaro	Iringa, Mbeya
Spring onion	<i>Allium fistulosum</i>		Dar es Salaam, Arusha, Coast, Morogoro, Kilimanjaro	Iringa, Mbeya
Nutmeg	<i>Myristica fragrans</i>	Kungu manga	Zanzibar, Arusha	

Source: BET, 2002

In Zanzibar, Clove marketing is a government monopoly of the Zanzibar State Trade Corporation (ZSTC). In addition to exporting cloves, they also extract essential oils, which are backed up with laboratory testing facilities and a research station with 32 scientists (BET, 2002).

There are several spice traders and processors in Zanzibar who, in addition to buying from small farmers, run their own commercial farms. These traders sell mainly in local markets such as supermarkets in Dar es Salaam and other urban areas with limited quantities exported limited quantities. The industry also has many small and medium size traders who buy spices from farmers and export to neighbouring countries like Kenya and abroad as well as act as middlemen to the larger exporter.

2.3.2 The opportunity for spice sector in Tanzania

According to BET, (2002) the spice sector presents a major opportunity for Tanzania to exploit and reap economic benefits in the relatively short term with only a nominal input of resources and attention. This opportunity is based on the following sources of competitive advantage and factors favouring the growth of the sector:

- i. At the macro economic environment level the government is already positively disposed to and advocating for public/ private sector smart partnership
- ii. The exchange rate and trade regimes are liberalized

According to BET (2002), there are potentials for the spice industry development in Tanzania including:

- i. Conducive climate and soils for the production of a wide range of spices and availability of large tracts of land suitable for expansion of production.
- ii. The spice sector is a long-standing one in the country.
- iii. The development of the spice processing industry including extraction of by-products and development of research and laboratory facilities for spices in Zanzibar.
- iv. The thousands of small farmers are already knowledgeable about spices and therefore training would not start from scratch.
- v. The existence of a large pool of small and medium size buyer-exporters who already have significant experience and knowledge of quality and markets, which only need to be deepened and broadened.

2.4 Classification of spices

2.4.1 Fruit spices

This group encompasses; Pepper, Capsicums, Chillies, Paprika, Pimento, and Vanilla. Whole black Pepper is the unripe fruit or berry of a tropical perennial creeper or vine. White Pepper is a product of the same plant with the seeds in the riper state and with the outside skin removed. (Whiteley, 1971) Capsicum and Chillies are fruits of various tropical perennials. The fruits vary considerably in shape, size, colour and taste. The larger fruits are capsicums and the smaller ones the chillies. The chillies are more pungent. (Purseglove, 1968).

Paprika or Hungarian Pepper is the red Pepper made from dried ripe fruit of Capsicum grown in Hungary and Spain (Hildreth, 1968). Pimento or Allspice is the dried unripe

fruit of tropical evergreen tree closely related to the cloves. The berries are nearly globular in shape and of light brown colour (Whiteley, 1971).

2.4.2 Seed spices

Mustard is made by grinding the seeds of the black Mustard and white Mustard plants. The Nutmeg tree yields two spices; Nutmeg and Mace. Nutmeg is the dried shelled seed and Mace dried aril covering the seed in the fruit (Pruthi, 1980). Cardamom is small dark brown seeds of the Cardamom plant (Heldreth, 1968). Cardamom seeds have a very pleasant flavour and aroma (Smartt, 1995). Fenugreek consists of small yellowish-brown seeds of a plant grown chiefly in Morocco and Tunisia (Heldreth, 1968). Coriander is the globular seed of a plant grown extensively in India. Unfortunately amongst the literatures reviewed no literature showing areas or places in Tanzania that are growing Fenugreek and Coriander. When ripe the Coriander seeds are very fragrant and have a pleasant, warm, pungent taste (Hildreth, 1968). Caraway seeds are the aromatic seeds of a plant grown in Holland and other European countries. The seeds are about 1/4in long, curved and of dark colour (Whiteley, 1971). Celery seeds are the seeds of the Celery plant (Hildreth, 1968).

2.4.3 Flower spices

Cloves are the dried unopened flower buds of tropical evergreen tree grown chiefly in Molluccas island, the Amboyna island, Zanzibar and Madagascar. They are strongly aromatic with a very characteristic odor and hot taste (Hildreth, 1968). Saffron consists of dried stigmas and tops of the styles of the saffron crocus which is grown chiefly in Spain (Hildreth, 1968).

2.4.4 Bark spices

Cinnamon is a product of an evergreen aromatic laurel, which grows wild and is cultivated in Sri Lanka (Smartt, 1995). In Tanzania Cinnamon is chiefly grown in Tanga, Morogoro and Zanzibar (BET, 2002). Cassia is a product of an evergreen aromatic laurel (Hildreth, 1968).

2.4.5 Roots spices

Ginger is prepared from the underground stem or rhizome of a tropical herbaceous perennial. The rhizomes are dug up, carefully peeled and dried. The dried rhizomes can be ground to a powder or preserved in syrup (Hildreth, 1968). The roots are harvested when a year old and can be used to produce black or white ginger. Black Ginger is the stronger in flavour and is prepared by cleaning the roots, which are then boiled, dried and finally crushed and ground to a powder (Whiteley, 1971).

2.5 Uses of spices

2.5.1 Domestic cooking

2.5.1.1 Improving taste and flavour of food

Rehm (1984) argues that the use of spices for improving the taste of foods is a cultural achievement of all races. In all parts of the world, civilized people use spices to flavour food and so make it more attractive and appetizing (Davidson, 1969). According to Whiteley (1971) spices are used in foodstuffs to add strong characteristic flavour.

2.5.1.2 Effect on appetite and digestion

Spices and condiments improve the flavour and acceptability of different food preparations. The active principles present in the spices act on the mucus of the membranes of mouth, stomach and intestines and stimulate the secretion of digestive juices (Rehm, 1984). Food acceptance has been influenced by the use of the spices, and Man's food supply has thereby not only been conserved but perhaps increased (Lownberg *et al.*, 1969). In poor families spices may contribute significantly to ascorbic acid content of the diet (Davidson, 1969). The value of spices for human nutrition has often been over-valued in the past. Their health giving effects are usually indirect. They stimulate the eye (as decoration of dishes) nose and tongue and thus stimulate the flow of saliva (starch digestion) and secretion of enzymes in the stomach-intestine system (protein and fat digestion). The effect on the digestibility of foods cannot be questioned (Rehm, 1984).

2.5.1.3 Effect on the intestinal flora

According to Rehm (1984), incorporation of certain spices for example garlic, in the diet helps to reduce intestinal flora and prevent flatulence. However, the active principles of some spices like chillies, black pepper possess strong pungency. Therefore Rehm (1984) reported that use of excessive amounts of such spices causes irritation of the mucous membranes and may be one of the contributory factors in the causation of peptic and duodenal ulcers among people.

2.5.2 Medicinal uses

In medicines cloves are stimulative, antispasmodic and carminative (Purseglove, 1968). Cardamom medicinally has carminative, aromatic, and stimulant properties (Smartt,

1995). Ginger oil obtained from its rhizomes is used in preparation of medicines (Smartt, 1995). Nutmeg is used medicinally and is said to have stimulative, carminative, astringent and aphrodisiac properties (Purseglove, 1969).

2.5.3 Perfumery use

The essential oils from cardamom are widely used in perfumery (Smartt, 1995). Also Nutmeg oil is used in making of perfumes (Pruthi, 1980). Cinnamon leaf oil is distilled from dried green leaves and is used in perfumes (Purseglove, 1968).

2.5.4 Industrial usage

According to Smartt (1995), ginger is extensively used in preparing beverages such as ginger ale and Ginger-beer. For a long time, the volatile aromatic compounds have been distilled off as essential oils, which essentially found applications in the drinks, industries (liquors) Rehm, (1984). Extracts of chillies are used in the manufacture of ginger beer and other beverages (Purseglove, 1968). Nutmeg oil is used for flavouring liquors and tonics.

2.5.5 Miscellaneous usage

Clove oil produced by distillation of Cloves is used in the manufacture of both salts and clearing agents in microscopy. The ancient Egyptians left Peppercorns in tombs for enjoyment of deceased in after life: kings frequently chose pepper as a gift to other kings (Lownberg *et al.*, 1968). Turmeric in Southern Asia is used in rituals (Smartt, 1995). It is now possible to purchase the essential oils or extracts of spices in the liquid or paste form (Whiteley, 1971), which are used as technical raw materials in industrial usage (Rehm, 1984).

2.6 High value Agricultural products and rural livelihoods

According to Temu and Temu (2005), high value crops refer to introduced food crops such as vegetables, fruits, flowers, houseplants and foliage, condiments and spices that fetch relatively higher prices in markets. Immediately after independence, Tanzania government and other sub Saharan Africa countries concentrated on production of staple crops such as maize and beans for food security. In addition, few traditional cash crops such as coffee, cotton, cashewnuts nut, tea and sisal were produced for export and as means for economic growth and development. However, returns to the exported traditional cash crops have been declining over time while the price for introduced cash crops such as spices is improving (Purseglove (1968). Thus introduced cash crops including spices are becoming increasingly important sources of income, rural livelihoods and economic (Pulsiglove (1968), 2005).

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study area

Morogoro region is one of the regions of Tanzania. Its capital is Morogoro it is bordered to the north by Tanga region, to the east by the Coast and Lindi regions, to the south by the Ruvuma region and to the west by the Iringa and Dodoma regions (URT, 1997). The Morogoro region is administratively divided into six districts: Mvomero, Kilosa, Kilombero, Ulanga, Morogoro Urban and Morogoro Rural. The research was conducted in Morogoro rural district in Kibogwa and Tawa wards. It is bordered to the east by the Coast region, to the south by the Morogoro urban district and to the west by Mvomero district. According to the 2002 Tanzania census, the population of the Morogoro rural district was 263 920 equivalent to 15% of the total regional population 1 759 809 (URT, 1997).

Agricultural and livelihood conditions are diverse. The average annual temperature in the Region's highlands is 18⁰C but it reaches 30⁰C in the lowland river valleys. Rainfall varies from 1200 mm in the highland plateaus to 600 mm in lowlands (URT, 1997).

3.2 Research design

The research design was cross sectional. According to Simon (1985) cross sectional case study design, allows for collection of in-depth information on specific cases at one point in time. This design is useful in that it helps to generate in-depth qualitative and quantitative data about production and marketing of spices in the study areas.

3.3 Sampling procedure and sample size

Purposive sampling technique was used, i.e. four wards that engage extensively in spices growing were chosen. From four named wards only two were randomly sampled i.e. Kibogwa and Tawa. Purposive sampling is recommended when sample elements and locations are chosen to fulfil certain criteria or characteristics or have attributes under study (Kanbur, 2001). Simple random sampling procedure was carried out in selecting households from individual village registers for the case of producers, also for the traders. A list of major spice producing wards was obtained from the Morogoro Regional Agricultural Advisor's office. These wards were Tawa and Kibogwa. Selection of villages took into account the presence of spices farmers. Simple random sampling was then employed to obtain the representatives sample of spice farmers. Eighty (80) farmers and fifty (50) traders were randomly selected, making a total of 130 respondents. The main spice market surveyed was Tawa.

3.4 Data collection

3.4.1 Primary data

Primary data were collected from farmers producing spices and traders involved in marketing of spices in the study area. Prior to administering questionnaires, a pilot survey was conducted so as to provide a general overview of the research area. The aim was to identify the key informants (spices growers) in the study area; the questionnaires were pre-tested to check for the validity and reliability. The study employed both quantitative and qualitative methods of data collection. The study included Focused Group Discussions (FGD's) and a single visit survey that was conducted between November and December 2005. The single survey visit involved interviews with farmers and traders.

Structured questionnaires were the main instruments for data collection (Appendix 1 and 2). Open, closed and tabular questions were designed to solicit information from the respondents. There is a growing recognition in the literature on field methods in development studies that a judicious combination of qualitative and quantitative methods can help solve problems that are associated with each method taken separately (Kanbur, 2001). In particular, qualitative methods are more appropriate for capturing the social and institutional context of people's lives than quantitative methods (Booth *et al.*, 1998). Focused Group Discussions (FGD's) technique was used to supplement information obtained through questionnaire surveys. The discussions were carried out at each ward centre. Two discussion sessions were conducted for each centre, one involving women (10 in number) and other one for men (10 in number). The discussions were formed around particular activities and issues (Appendix 3).

3.4.2 Secondary data

Secondary data were obtained from various reports such as district agriculture office reports; Board of External Trade reports (BET) and other relevant statistical publication on spices production and marketing.

3.5 Data analysis

Data collected were summarised, coded and analysed using the Statistical Package for Social Sciences (SPSS) for Windows. Distributions and magnitudes of variables were determined. Descriptive analysis was done to determine frequencies, means and standard deviations. Correlation coefficients and means comparison were calculated to determine the degree of association and significant differences between means. Two independent

samples t-test was used to compare the mean income from spices and other major crops (Appendix 4).

3.6 Data limitations

The following are some of the problems encountered during data collection activity;

- i. Literature review for production and marketing of spices were also very limited. Information from web pages was sought but to a large extent did not comply with Tanzanian situation.
- ii. Information on farm/plot sizes and yields for crops grown by the households was based on estimations as were given by the farmers themselves during interviews. There seem to be great variations among estimations given, therefore suggesting some problems in data reported.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Farmers' social economic characteristics

Amongst socio-economic characteristics investigated includes, age, gender, marital status, education level and occupation.

4.1.1 Farmers age structure

The mean age of the household head was 49 years, with a range between 23 and 71 years for Tawa respondents. With respect to age categories; for respondents below the age of 18 years class was 33.3%, 18-35 was 25.7%, 36-50 was 26.7% and above 50 was 14.3% (Table 2).

Mean age for Kibogwa ward was 48 with a range from 23 to 72 (Table 2). According to age categories; below 18 was 35.8%; 18-35 was 27.9; 36-50 was 22.5 and above 50 was 13.7. The results indicated that high proportion of the spice farmers were of the age category between 18 to 35 years. This showed that, most of the farmers were within the productive group, thus integrating these people to spices production would improve the productivity of these crops. Asfaw and Admassie (2002) argue that there is a certain threshold age beyond which the ability of farmers to take risk and adopt innovations decreases. This means that there young farmers are more likely to face the risks associated with innovations (uncertainty in yield and unfamiliarity in technology) and to adopt them than their older counterparts.

24/1/18

Table 2: Farmers socio-economic characteristics in Tawa and Kibogwa wards

Characteristic	Tawa	Kibogwa
	n= 40	n= 40
Gender		
Male	83.0	84.0
Female	17.0	16.0
Total	100.0	100.0
Marital status		
Married	80.0	90.0
Single	2.5	1.0
Divorced	0.0	0.0
Widow	17.5	9.0
Total	100.0	100.0
Age of respondent)	49	47.73
Min.(years	23	23
Max. (years)	71	72
Mean (years)	14.11	13.22
Age categories		
<18	33.3	35.78
18-35	25.71	27.94
36-50	26.66	22.72
>50	14.28	13.56
Total	100.0	100.0
Main Occupation		
Farming	90.0	95
Petty trading & farming	7.5	3.8
Farming & civil servant	2.5	1.3
Total	100.0	100.0
Education		
No formal education	17.5	18.8
Primary school	72.5	76.3
Secondary school	10.0	5.0
Total	100.0	100.0

4.1.2 Education levels

Education level of respondents from Kibogwa ward varied considerably. The study results (Table 2) revealed that 18.8 % of the respondents had no formal education, 5% completed secondary education and majority 76.3% had primary education. For the case of

respondents from Tawa ward (Table 2), 17.5% had no formal education, 10% had secondary education and 72.5% had primary education. The causes for low education attainment varied. In the study areas, these would include little interest in education in favour for other activities like assisting in farming, forcing girls into early marriages and inability of the parents to pay for school fees, contributions by way of cost sharing and others.

4.1.3 Marital status

Kibogwa respondents 90% were married, 1.3% single and 8.8% were widows. Tawa respondents 80% were married, 2.5% single and 17.5 were widows (Table2). Greatest proportions of farmers were married couples. Married couples are required to fulfil a number of obligations both productive and reproductive. In such situations they are involved in a number of activities so as to diversify the livelihoods options to cope up with some shocks like hunger, disease, and drought.

4.1.4 Occupation

The results from the study showed that farming was a major economic activity for most of spice farmers in both wards i.e. Kibogwa and Tawa. In Kibogwa ward the results (Table 2) indicated that 95% of 40 farmers interviewed, farming was their main occupation, 3.8% engaged in both farming and petty trading and 1.3% comprised of civil servants who also engaged in farming activities.

In Tawa ward, results showed that 90% of the 40 farmers interviewed, farming was their main economic activity, 7.5% engaged in farming and petty trading and 2.5% comprised

of civil servants engaged also in farming activities (Table 2).

4.1.5 Land resource

Land is a valuable resource in the sampled wards and land was acquired through inheritance, borrowing, buying or allocated by village government. Each family had access to land for cultivation although many farms were located far from home with walking time ranging from 0.08 to 3 hours (Table 3). Land holdings per household were generally small and fragmented with land size ranging from 0.25 to 5 acres (Table 3) that was distributed in about three plots. This can be explained by the fact that the area is mountainous in nature which makes difficult to have a bigger farm or plot at one location.

Inheritance of land was based on matrilineal type in the sense that uncle's clan had the right to redistribute land among clan members. Otherwise the alternative option was either to buy or migrate to un-owned distant bushes to clear for new farms. In addition, the practice of renting land; locally known as *rubako* and paying some agreed amount of either money or harvest was common in the area.

Table 3: Farm size and location in Kibogwa and Tawa wards, Morogoro, Tanzania

Variable	Mean	Minimum	Maximum
Plot size (acre)	2.6	0.25	5
Walking time (hrs)	1.5	0.08	3
Number of plots (units)	3.0	1.00	5

4.1.6 Economic activities

Agriculture (crop farming) is the major economic activity for spice farmers in the study area (traditionally crop growers). The study results (Table 2) showed that 95 %- Kibogwa;

90% -Tawa of the spice farmers their main activity was farming where as only 5 % - Kibogwa; 10%-Tawa of the farmers are involve in both farming and other activities (off farm activities) such as brick making, petty trading and carpentry.

The most important crops grown for food were maize, paddy, cassava, and taro. Rice and maize were regarded as staple foods for the farmers. Cash crops included, bananas (*Musa* sp), pineapples (*Ananas comosus*), coconut (*Cocos nucifera*), citrus fruits notably mandarin oranges (*Citrus sinensis* var. mandarin) and breadfruit (*Artocarpus altilis*).

All crops were produced under small-scale without external input usage. Hand hoe was the sole farm implement for farm operations such as cultivation, planting and weeding, which were done manually. Use of labour saving technologies such as tractors has been recommended as one of the important factors to ensure improved agriculture productivity and poverty alleviation in Tanzania (URT, 2005b). However, mountainous landscape of the areas studied limits use of draught animals and tractors.

4.2 Spices production and production systems

4.2.1 The history of spice production in the Uluguru Mountains

Black pepper is the oldest spice crop in the study areas as compared to others; Black pepper started to be grown since 1950s (Table 4). Since then, this crop has been continuously cultivated in the area. This can be explained by the fact that its importance had been increasing and it was found that its cultivation became optimal during the years 1980s to 1990s when most of the farmers started to cultivate it. Vanilla is the very recently introduced spice crop in the study areas as it is indicated that many farmers started

growing Vanilla between 1990s and 2000. Overall, the majority of farmers reported to have started production of Cinnamon, Cardamom and cloves between 1980s and 1990s.

Table 4: Periods for introduction of different spices in Tawa and Kibogwa wards, Morogoro

Type of spice	Year of introduction	Percent of respondents (%) (N=80)
Cinnamon	1971-1980	4.2
	1981-1990	45.8
	1991-1999	31.3
	2000 & later	18.8
	Total	100.0
Cardamom	1971-1980	11.1
	1981-1990	27.8
	1991-1999	22.2
	2000 & later	38.9
	Total	100.0
Cloves	1971-1980	2.1
	1981-1990	36.2
	1991-1999	40.4
	2000 & later	21.3
	Total	100.0
Black pepper	1950-1960	1.4
	1961-1970	8.6
	1971-1980	15.7
	1981-1990	30.0
	1991-1999	21.4
	2000 & later	22.9
	Total	100.0
Vannila	1990-1999	25.0
	2000 & later	75.0
Total		100.0

4.2.2 Spice cropping systems

Different types of spices are cultivated in the study villages. The major ones are; black pepper, Cinnamon, Cardamom, Cloves, Ginger and Vanilla that has been introduced

recently. According to the different climatic condition of the study wards Vanilla and ginger were only found in Kibogwa ward.

The cropping patterns for spices in the study areas as for the case of other crops were monocropping and mixed cropping. Data on cropping patterns in the sample villages indicate that monocropping was not a common practice. Crops grown as monoculture were said cinnamon, rice, pineapples, cassavas and maize. The explanation for this agricultural practice was a belief that such crops did not perform well if intercropped with others. Intercropping or mixing of different crops in one field was however the most common cropping pattern practised in the study villages. The data indicate that 99% of interviewed farmers practice intercropping. The most common crop combinations included perennial crops such as black pepper, bananas, cloves, citrus fruit trees and coconut trees that were intercropped with annual crops like maize, legumes, taro and sweet potatoes.

Shortage of free arable land is one of the explanations for intercropping practice. Another reason mentioned for prevalence of intercropping pattern was that the farmers had no ability to manage big farms given labour demands in managing big farms. Cultivation in both wards was primarily rain fed. Kibogwa ward is at high altitude and thus its cool condition favoured long maturing crops such as bananas, fruit trees; orange trees (*Citrus spp*), tuber yam, cassava, and taro. These types of crops were mainly for subsistence consumption for many households with exception of bananas.



Main spice crops grown in Kibogwa ward included Cinnamon, Cloves and Black pepper. Cinnamon and cloves were new ones for most farmers in the sense that they were not yet to mature. In Tawa ward Black pepper was the dominant spice crop as compared to other spice crops which included; cinnamon, cardamom and cloves.

4.2.3 Supply of agricultural inputs

Farming activities in the study areas were based on traditional technologies in the sense that only limited amount of external inputs such as fertilizers, pesticides, and improved seeds were used. Farmers used mainly inputs produced at the household such as manure in plots around homestead. However, use of some chemical inputs (copper sulphate for dusting/fumigation) was mentioned in horticultural gardens (tomato). These were purchased from shops in Morogoro town.

4.2.4 Farm implements and technology

Use of hand hoe was a prominent feature for all farmers that were interviewed; no single household was reported using a tractor or draught animals in cultivation activities. This is because of the mountainous nature of the area. Family labour was the main source of labour for most farmers, just a few farmers could afford use of hired labour in their agricultural operations particularly cultivation and harvesting of spices.

4.2.5 Factors influencing spices production

4.2.5.1 Infrastructure

Infrastructure play an important role for rural household by improving the working of markets, speeding the flow of information and increasing the mobility of people, resources and outputs. Tawa village, which is also the ward centre, has a primary school, secondary

school, health center, market, pharmacy, shops, church, mosque, milling machine and primary court. Kibogwa ward had a dispensary, a primary school and village government office. The state of roads in the study areas was poor. The only road from Tawa to Kibogwa was very poor (a rough road with limited maintenance) not passable particularly during the rainy season. Farmers from Kibogwa ward for example transported crops to the general market, which is located at Tawa centre about 10km by head loads. Use of bicycles is limited because of the mountainous nature of the area. The access to Matombo, which is the division administrative centre, is by a dirty road about fifteen km from Tawa centre. There were public transport services; min buses and trucks from Tawa to Morogoro town on daily basis on a charge of Tshs 2500/= to 3000/= per person as fare.

4.2.5.2 Market information

Information sources to farmers are restricted within their villages especially near markets. The farmers' main need for information is to make comparison of product prices offered through various market outlets and a guide in planning future production. Informal communication appeared to an important channel for market information flow. Of the interviewed respondents, 78.8% indicated that neighbours and friends were the main source of market information (Table 5).

Table 5: Farmers sources of market information in Tawa and Kibogwa ward, Morogoro

Sources of market information	Frequency	Percent
Hear from neighbours and friends	63	78.8
Crosscheck with middlemen	11	13.8
Direct visit to market	3	3.8
	3	3.8
Total	80	100.0

The availability of market information to a great extent was determined by the presence of buyers in the village at harvesting season. For cinnamon the case was different but still its market was at peak when other spices were being harvested. Farmers tend to accept price offered by the buyer who comes to the village especially during harvesting time because of limited selling options.

4.3 Spices and livelihoods

Ellis *et al.* (2005), defines livelihood as a term used to capture not just what people do in order to make a living, but the resources that provide them with the capability to build a satisfactory living, the risk factors that they must consider in managing their resources, and the institutional and policy context that either helps or hinders them in pursuit of a viable or improving living. In the study wards, households obtain their livelihoods from a diverse portfolio of income sources. The majority of farmers depend on agricultural based livelihood. Tawa ward 90% (Table 2) and Kibogwa ward 95% (Table 2) of the respondents main occupation is farming. Therefore agricultural incomes were important for households in the study areas particularly from high value agricultural products like spices. Two livelihood indicators are used to assess the role of spices to people's livelihoods, income and food security.

4.3.1 Spices and household income

According to Ellis (2000), income comprises both cash and in-kind contributions to the material welfare of the individual or household deriving from the set of livelihood activities in which household members are engaged. Results showed that household incomes depend on farming activities (Figure 2).

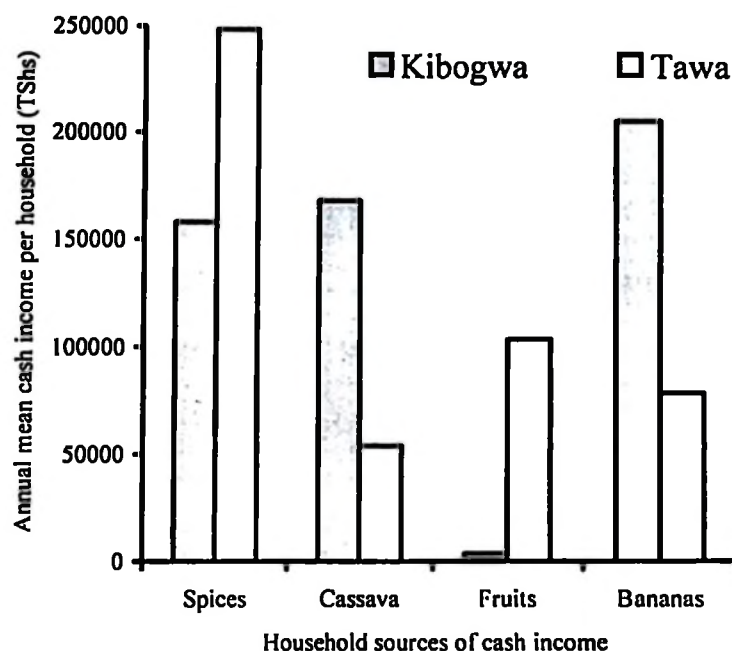


Table 6: Household major sources of cash income in Kibogwa and Tawa wards, Morogoro

The main household sources of incomes were; spices, cassava, bananas and other fruits. Through information gathered during Focused Group Discussions (FGD's) it was learnt that livestock keeping is not a culture for *Waluguru* people who are mostly the inhabitants in the study area.

Spices contribution to the household cash incomes was important in the study villages. Figure 3, the mean cash income accrued from spices per season was 39% ranking the highest in comparison with other crops considered as major ones. Bananas were the second after spices making a proportion of 28%, then cassava 22% and lastly fruits 11%. Spices were important contributor to the household's cash income. The cash obtained through selling of spices was very important in meeting several economical and social

demands such as house construction, purchasing assets like bicycles or radio, payment of school fees and buying food during time of deficiencies. Expenditure of cash income accrued from spices also covered other needs like clothes, soap, kitchen utensils, food item like sugar, salt and cooking oil.

The degree to which the spices contribute to the household incomes varied a lot between households. Thus promotion of spices is an important subject in an endeavour to fight poverty in the areas of production and other potential areas.

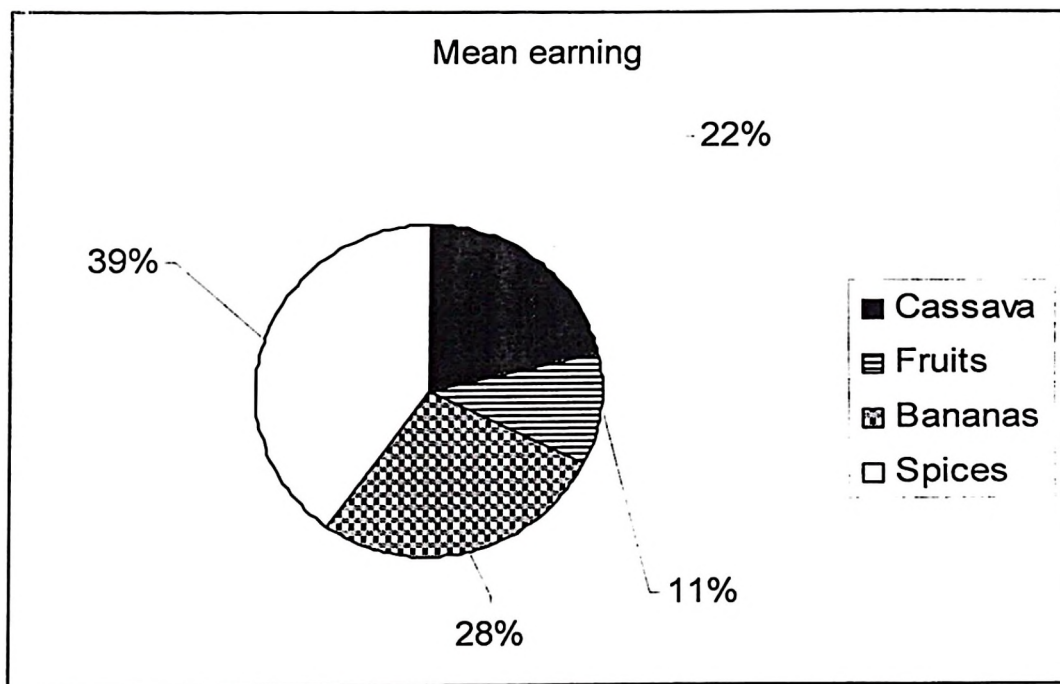


Figure 2: Proportions to household cash incomes from spices and other crops

4.3.2 Spices and food security

The World Bank (1991) defines food security as access by all people at all times to adequate food for an active life. The major factors that determine the ability of a household to acquire adequate food throughout the year is its ability to produce or

purchase food. During the Focused Group Discussions, participants indicated that food shortage was critical from planting to harvesting periods of cereal crops that is between the months of November and March. It was during this time when the importance of perennial crops such as bananas, cassavas, fruits and spices was mostly appreciated in relation to food security. Food purchasing/buying using money obtained through selling of bananas, fruits (mangoes, pineapples) or spices was mentioned as a common immediate measure for food shortage among households.

4.5 Trader's socio-economic characteristics

Socio-economics characteristics of the sample traders used in this study are shown in Table 6.

Table 7: Traders socio-economic characteristics in Tawa and Kibogwa wards, Morogoro

Characteristics N=50	Value
Gender	
Male (%)	82.00
Female (%)	18.00
Marital status	
Married (%)	58.00
Single (%)	22.00
Divorced (%)	12.00
Widow (%)	8.00
Age	
Mean (years)	39.78
Min.(years)	18.00
Max. (years)	70.00
std error	14.20
Education	
No formal education (%)	18.00
Primary school (%)	76.00
Secondary school (%)	6.00
Type of trader	
Wholesalers (%)	49.00
Middleman (%)	4.10
Retailer (%)	46.9
Nature of trade	
Full time (%)	34.00
Part Time (%)	66.00

4.5.1 Age

The mean age for traders was found to be 40 years with a range from 18 to 70 (Table 6).

Most traders are concentrated in the age range of 25 to 40 years indicating that mostly

spices trading particularly to distant markets is the young men activity as compared to other groups of age categories meaning the elders and children. . This shows that, most of the traders are within the productive group, thus integrating these people to modern spices trading skills will improve the business, which will result to the improvement of production spices.

4.5.2 Gender

Males constituted 82% where as female were only 18 % of 50 (Table 6) spice trades that were interviewed. This indicates that men as compared to women mainly do spice trading. The explanation for this as according to information obtained during Focused Group Discussion is that trading activity involves extensive travelling from the villages to distant markets like in Morogoro, Tanga, Mwanza, Dar es Salaam and sometimes to places like Mombasa in Kenya. In such situation it becomes very difficult for women (58% Married) who are supposed to carry out other productive and reproductive responsibilities at home.

4.5.3 Marital status

High proportion of the traders were married 58%, 22% of the traders were single 12% divorced and 8% widows (Table 6). This is explained by the fact that marriage is an institution that has great control or influence on family matters. Married couples are required to fulfil a number of obligations both productive and reproductive. In such situations they are involved in a number of activities spice trading being among them so as to earn more income as in comparison with unmarried couples.

4.5.4 Education level

Traders exhibited different levels of education with a great proportion having primary education 76%, 18% had no formal education and 6% had secondary school education (Table 7). It implies that the traders know to read and write therefore can make proper judgements as far as spices and other produce marketing is concerned. According to (Asfaw *et al.*, 2002), educated people are expected to perform certain jobs and functions with high efficiency and are more likely to adopt new technologies in a shorter period of time than uneducated people. This is mainly because more educated people can gather process and interpret all available information, differentiate between promising and unpromising investment areas, and make decisions more easily with relatively small errors.

4.5.5 Type of traders

Results indicated that there three categories of spice traders namely, wholesalers, Middlemen and retailers. The majority of traders were wholesalers making up to 48% of the interviewed traders and retailers representing 46% of the interviewed traders. A wholesaler usually buy spices from farmers, middlemen's or other wholesale traders and resale the produce to retailers or direct to consumers. Retail traders tend to buy spices from wholesaler, middlemen, or farmers and sell directly to consumers. Retail spice business comprises of a small group of market participants as opposed to wholesale traders. Retail traders provide useful information to other market functionaries since they normally meet directly with final consumers of the produce.

4.6 Spice marketing systems

4.6.1 Nature of the spices trade

Spice trading is divided into two categories which were fulltime and part time. The results from the study indicated that 66% of spice traders were part time and 34% were full time (Table 6). The reason for this is that oftentimes a spice trading activity is seasonal, in the sense that it is at its peak during harvesting time particularly for black pepper and cloves (July, August and September) and becomes redundant during the remaining times. For Cinnamon, there is no specific time. The only determinant factor is the maturity of the cinnamon tree trunk for harvesting (Cinnamon is a perennial crop). It therefore comes apparent that during other times the traders are involved in other economic activities such as agricultural activities with exception of those who came from urban centres like Dar es Salaam, Tanga and Mombasa were thought to have specialized in trade businesses.

4.6.2 Sources of market information

The purpose of market information is to assist farmers and traders in balancing supply and demand on particular markets and so limit excessive price fluctuations.

Table 8: Source of market information for spice traders in Kibogwa and Tawa wards, Morogoro, Tanzania

Sources of market information	Frequency	Percent
Telephone	6	12.0
Visit to market	6	12.0
Talk to other traders	38	76.0
Total	50	100.0

From the study results it was depicted that use of telephone, direct visit to the markets and talking to other traders were the major means of market information dissemination. Talking to other traders was found to be the mostly adopted means of communicating market information 76 % (Table 7). Direct visit to market ranked second (12%) where as use of telephone 12%. Results in Table 7 show that traders relied more on other traders while at the market to obtain the marketing information as compared to other sources.

4.6.3 Spice marketing channels

Marketing channels are groups of individuals and organizations that direct the flow of products from producers to final consumers. The survey carried out, found that the marketing channel for spices vary considerably (Figure 3). The producer can sell his/her spices either to the local market, local traders, middlemen or buyers coming from urban centres. Brokers are needed as the spice trade is based on some personal relationships, therefore brokers do transfer information of the quantities and prices supplied and demanded. From the farmers to consumers spices do pass through various handlers; middlemen, wholesalers, retailers and finally to consumer (Figure 4). Referring to the study the following participants were identified with regards to their respective roles producers, local trader, middlemen, trader from urban areas, wholesalers in urban areas, retailer in urban areas and final consumer.

Local traders collect spices from producers by offering prices for which they are willing to buy. There after spices are collected into quantities for easy transportation at local trader's residences, market centre or middlemen's homes. Once spices have been bought either

from producers or local traders they are transported to places like Dar es Salaam, Tanga, and Mwanza.

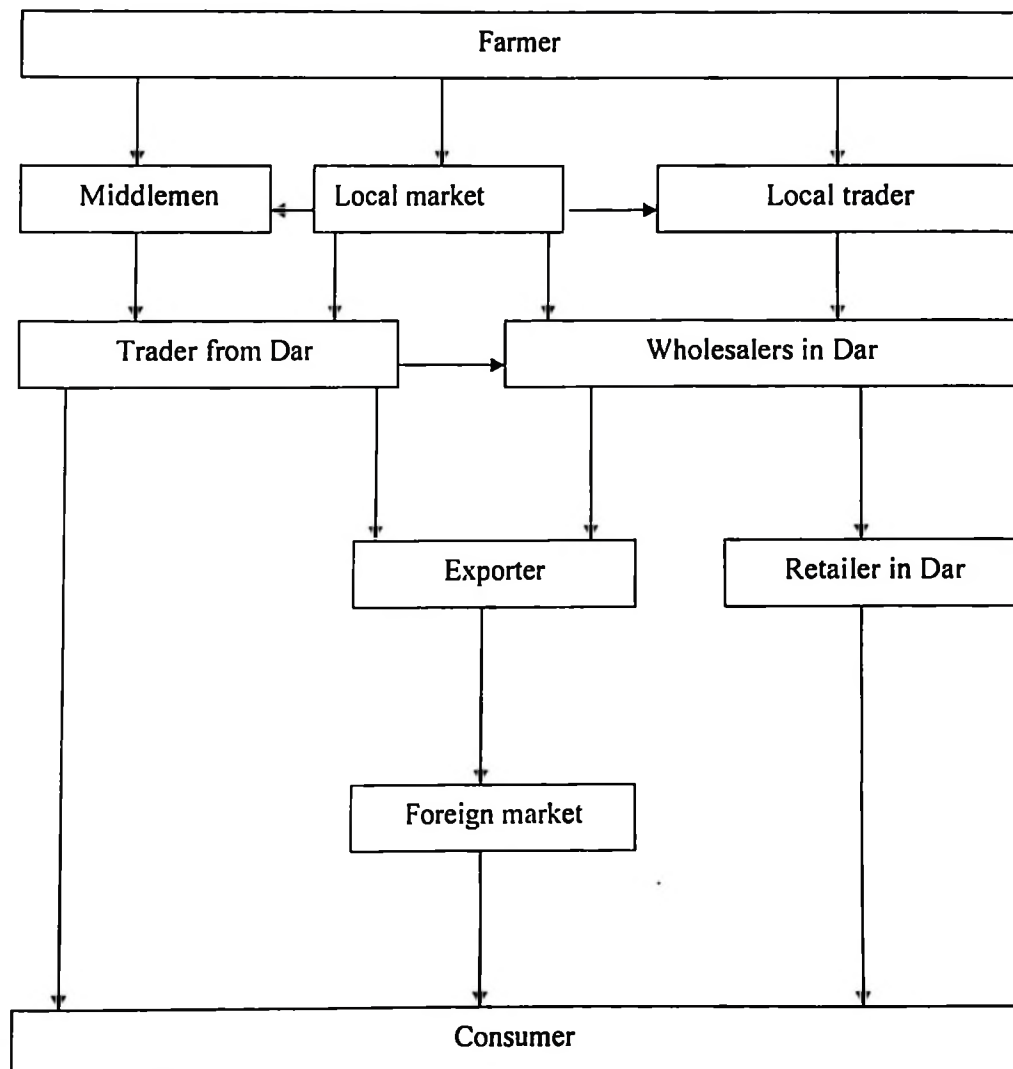


Figure 3: Marketing channel for spices in Tawa and Kibogwa wards, Morogoro, Tanzania

From the study findings no single trader owned means of transport, hiring trucks was the only means considered cost effective to transporting spices, which in anyways were collected and transported together with other crops. Generally it was learnt that, the marketing channel for spices are as for other crops, the same individual may fulfil the role and the function of broker, wholesalers and a retailer at the same time.

4.7 Factors influencing the growth of spice sector

4.7.1 Constraints for spice farmers

The study findings reveal that the main farmers constraints includes, Lack of extension services, lack of capital, unstable market, Lack of transport, dependence on hand hoe, insufficient land, pests, drought and theft (Figure5).

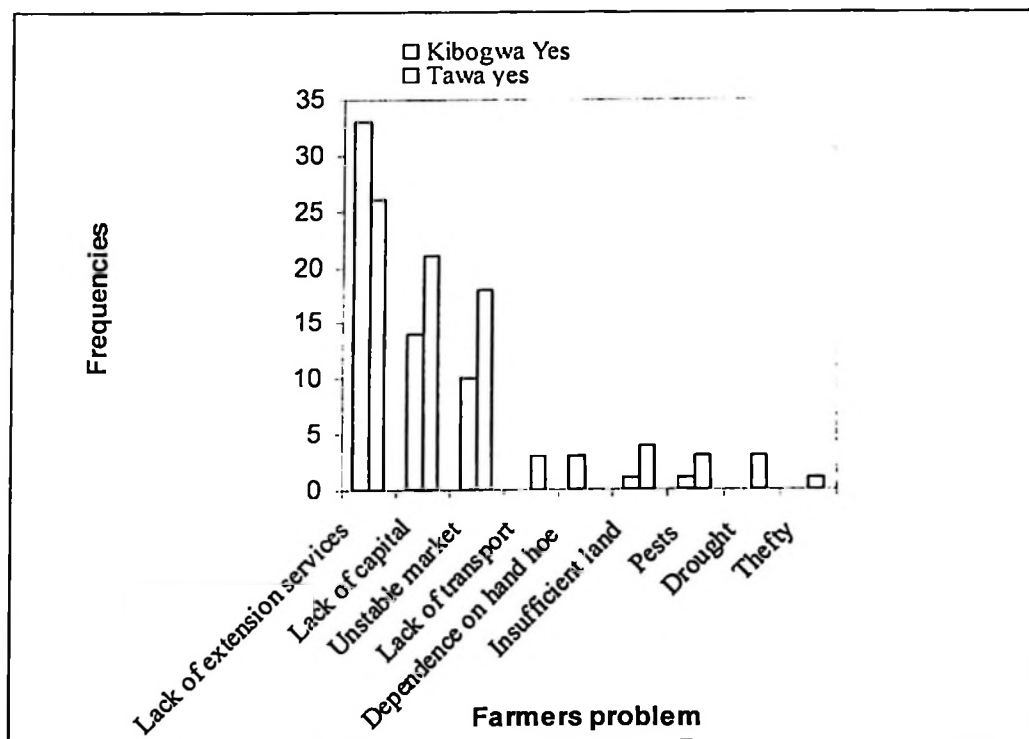


Figure 4: Major constraints for spices producers in Kibogwa and Tawa wards, Morogoro, Tanzania

4.7.2.1 Capital and credit for spice production

Low level of cash investment for agricultural production has potential negative impact on spices production. Every farmer had a strong desire to expand his farm acreage but due to lack of financial capital, farm sizes were small factors causing low production of spices and other crops. Poor technologies might be due to lack of financial capital investment. Credit refers to working capital obtained by the borrowers from the lenders. It also refers the transfer in cash or in kind with an obligation to repay (Kashuliza, 1986). However these credits can be obtained through three levels of formal credit institutions, semi- credit arrangement and informal credit arrangement.

It is evident from the study that the financial capacity of the farmers to finance farm operations is one of the main limiting factors for promotion and development of spice production in the study areas. None of interviewed farmers reported from the study area to access credit for spice production. Problems of access to credit by farmers severely limits uptake of improved technologies and investment in productive assets or activities offering high-expected rates of returns. Access to agricultural credit and credit for non farm activities would enable the farmers to expand the scale of production and raise income levels to enable them to pay for better education and health. Farmers had continued to rely mainly on their own resources occasionally supplemented by credit from traditional sources like borrowing from clan members or friends. Number of reasons makes access to formal credit difficult for farmers, amongst them being remoteness and poor transport and communication infrastructure that limit possibilities of economically locating financial institutions in study areas.

4.7.2.2 Access to extension services

According to URT (2003, 2005a) the general purpose of agricultural service delivery is to improve the productivity of agricultural systems, to raise the incomes of the farm families and improve the quality of life of rural farm households. Effective agricultural extension services appeared to be lacking in the study areas particularly on the issue of spices. Extension advice, mainly from government (93%), reaches very few smallholder households, and even in those it does reach it is not clear whether households link the use of inputs (for example improved varieties, agrochemical use, etc.) with production and marketing (URT, 2005a).

The results from the study showed that none of the farmers interviewed reported to be visited by an extension officer regarding spice crops. Through focused group discussions the farmers said that there were no agricultural officers with expertise in spices, instead they had specialization in other cash crops like coffee, pineapples, cotton and others. Obviously this was not the reason behind, it was the stigma farmers had built as a consequence of inadequate extension services, which had been provided to them in relation to spices.

4.7.2 Main constraints for spice traders

The results from the study indicated that the major constraints for spices traders are unreliable prices, unstable market, lack of capital, scarcity of spices, high transport costs, lack of marketing skills and knowledge (Figure 6). Even if most of the traders interviewed had been in spice trading activity for quite so long (5- 10 years), still their level of knowledge in basic business skills was very low. This could be associated with their low

level of education since (76%) of interviewed traders are standard seven leavers. Insufficient knowledge and marketing skills for traders is depicted sometime to an extent of not being able to distinguish between revenue and profit thereby ending up consuming their working capitals.



Figure 5: Major constraints for spices trader in Kibogwa and Tawa wards, Morogoro, Tanzania

On the other hand, lack of capital had been a consequence of having no formal credit institutions that may render credits and soft loans to the traders the study areas. As it was the case for the spice farmers, the traders also rely mainly on their own resources occasionally supplemented by credit from traditional sources. Spice traders face market problem in the sense that the market is not reliable. Probably this is because there is no traders' association and no institutional representation therefore low power to negotiate for better prices for the spices. When asked to explain why they don't form association,

every trader showed an urge to have such associations' but due factors like differences in capital; lack of trustworthy amongst traders were the reasons behind not forming associations.

4.7.3 Opportunities for spice sector development

4.7.3.1 Natural comparative advantages

- i. The surveyed villages have diverse agro-climatic zones, which are conducive for production of a wide range of spices and good soils suitable for expansion of production.
- ii. Almost every farmer is already knowledgeable about spices and therefore training would not start from the scratch.

4.7.3.2 Market comparative advantages

- i. The existence of a large pool of small and medium size buyer-exporters who already have significant experience and knowledge of quality and markets, which only needs to be developed and broadened
- ii. With regard to taking advantages of premium prices paid for organic produce, the bulk of production is from small-scale farmers whose mode of agriculture is chemical free. The process of converting chemical free production to certified organic has already started and can be accelerated easily.

4.7.4 Spice prices structure

Cardamom, cinnamon, cloves and black pepper were the major spices produced from the study areas, though the majority of farmers interviewed reported on obtaining low prices

for their products. As expected respondents spices price fluctuation with season (Table 10).

Table 9: Spice price structure in Tawa and Kibogwa wards, Morogoro, Tanzania

Type of spice	Price per kg*
Cinnamon	
Mean price (Tshs)	613
Min.Price (Tshs)	400
Max. Price (Tshs)	1000
Std error	196
Cardamon	
Mean price (Tshs)	2 097
Min.Price (Tshs)	1 500
Max. Price (Tshs)	3 000
Std error	563
Cloves	
Mean price (Tshs)	2 600
Min. Price (Tshs)	1 500
Max. Price (Tshs)	3 000
Std error	387
Black pepper	
Mean price (Tshs)	1 346
Min.Price (Tshs)	900
Max. Price (Tshs)	2 000
Std error	323

*Prices are as of July-December, 2005

Mean prices for cinnamon, cardamom, cloves, and black pepper in study villages were Tshs 613, 2 097, 2 600 and 1 346 respectively (Table 8). Cloves and cardamon fetched

higher prices in comparison to cinnamon and blackpepper. Farmers claimed that there had been fluctuations in prices for almost all spices in previous seasons.

CHAPTER FIVE

5.0 CONCLUSIONS AND RECOMMENDATIONS

The overall objective of this study was to examine the importance of spice production to the farmers' livelihoods. The specific objectives of the study were; to identify spice production systems, to determine the contribution of spices to the overall household income, to identify the spices marketing systems and to identify factors influencing the growth of spices sector in production areas in Morogoro rural district.

5.1 Conclusions

Spice crops are considered as cash crops for the farmers in the study areas. It is evident from the study findings that in Tawa and Kibogwa wards every house hold cultivates at least one type of spice. The main types of spices that are cultivated are black pepper, cinnamon, cardamoms and cloves. Black pepper is the main spice at Tawa ward where as cinnamon and cloves are the leading spices at Kibogwa ward. Spices contribution to the household cash incomes was statistically not significant at 95 confidence level (0.064 Appendix 4) when compared to that of other crops considered as major ones; bananas, cassavas and fruits. However they are important contributor to the general livelihoods of the households because of their potential to meet several economical and social demands. The degree to which the spices contribute to the households incomes vary a lot depending on factors like size of plots, type of spice and other social parameters such as family labour. Therefore it is worth noting here that, an agricultural income continues to be important for households in the study areas particularly for those high value agricultural products like spices negating at the moment the theory that becoming less reliant on

agriculture is part of the process of climbing out of poverty in Tanzania as given by Ellis, and Freeman, (2005).

Spice production was being done by small-scale farmers whose main production implement was a hand hoe. Cropping patterns for spices were monocropping and mixed cropping. Cultivation was principally rain fed based on traditional technologies (no use of modern inputs). Amongst major factors influencing spice production were state of infrastructures like roads and communication facilities, supportive services (extension services and, inputs supplies and markets). With regards to marketing channels for spices the following participants were identified; producer, local trader, middlemen, trader from urban areas, wholesaler in the urban areas, retailer in the urban areas and finally the final consumer.

5.2 Recommendations

5.2.1 Extension services

Spice farming in the study area is under traditional technologies that require limited skills. The type of agriculture under use in the area is organic agriculture. As applied to other tradition cash crops external farming techniques are compulsory for spices. It is, therefore, crucial to build the human capital of households if they are to benefit from new technologies and emerging opportunities for commercialization. Extension systems though facing severe budgetary limitations might use their limited resources to improve the technical capacities of both farmers and traders.

5.2.2 Marketing infrastructures and information

Improving road infrastructure has been on the government agenda for a long period of time but it has not received the emphasis and sense of necessity that it requires. Increased funding for physical infrastructure (trunk and feeder roads, telecommunications, market infrastructure) both from national and international sources could play a significant role in reducing scarce resources allocated for the infrastructures.

Medium and relatively large scale commercial privately owned agriculture enterprises are likely to contribute towards rural service and infrastructure such as trunk and feeder roads. They may also generate adequate savings for re-investment in rural services and infrastructure and can co-exist with smallholder growers and extend their benefits through out grower type of scheme. The role of the government, NGOs, donor funded projects would be more of a facilitator of the growth process.

5.2.3 Access to credit

Many households would like to specialize in agriculture but lack of money to purchase inputs and hire labour is a big constraint. Therefore provision of credit is the way that capital constraints can be alleviated. Since attempts to form savings and credit co-operative societies (SACCOS) in every ward have not proved success, formation of informal savings and credit associations (SACAS) should be encouraged. These can either operate as a revolving fund or offering small loans at low interest. They real offer an excellent opportunity as a starting point for the use of group mechanism in assessing credit to the farmers in the study areas.

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APENDICES

Appendix 1: Farmer's questionnaire

SPICES PRODUCTION AND HOUSEHOLD INCOME IN MOROGORO RURAL DISTRICT

District.....

Division.....

Ward.....

Village.....

Questionnaire No Date of interview..... Interviewer's Name.....

1. 0 Household information

1.1 Name of the respondent.....

1.2 Age of the household head in years.....

1.3 Sex

1= Female

2= Male

1.4 Marital status

1=Married 2=Single 3=Widowed 4=Divorced 5=cohabitation

1.5 Education level of the respondent

1=No formal education 2=Primary education 3=Secondary education

4= post secondary education

1.6 Main occupation

1=Self employed 2=Farming 3=Unemployed 4=Employed

5=others (specify)

1.7 Household composition

Age group	Number (size of age category)
Below 17 years	
17-50 years	
Above 50 years	

2.0 spices production

2.1 What type of spice do you grow?

1=cinnamon 2=cardamom 3=cloves 4=Black/white pepper

5=others (specify).....

2.2 When did you start growing spice?

2.3 How big is your spice field?

Hectares..... Number of trees..... (Cloves)

2.4 How many spice plots do you have?

2.5 If you have more than one plot how far are they located?

1= close to each other 2=Not close to each other

2.6 What is the size of the plots?

Plot No	Plot location	Plot size	Crop grown	

2.7 What type of technology did you use to cultivate the field?

1=Hand/Manual 2=Animal Traction 3=Tractor

2.8 Would you like to expand them?

1=Yes 2=No

2.9 If No why?

If yes, at what size?.....

2.10 Could you please estimate the total spice harvest per season/year?

Type of spice	Output	Price per unit (Kg/bag)	Revenues
Cardamom			
Cinnamon			
Cloves			
Black/White pepper			
Others			

2.11 Do you use any chemical fertilizers in spices plots/fields?

1=Yes 2=No

2.12 If No why?

1=Not available 2=Lack of funds 3=Lack of knowledge

2.13 If yes, what types?

.....

.....

.....

2.14 What costs that is encountered in raising the spice crops?

Inputs	Quantity used	Price per unit	Cost
Fertilizers			
Pesticides			
Seeds			
Herbicides			
Labor			
Cultivation			
Weeding			
Harvesting			
Others			

2.15 What are major problems in growing spices?

.....

.....

.....

2.16 What other crops do you grow apart from spices?

Crop grown	Area of cultivation(hectares/Number of trees

2.17 Could you please estimate the total harvest from each crop?

Crop grown	Output	Price per unit	Revenues

2.18 Could you please estimate the costs involved in growing other crops?

Source of cost	Quantity used	Cost per unit	Total
Inputs			
Fertilizers			
Pesticides			
Herbicides			
Seeds			
Labor			
Cultivation			
Weeding			
Harvesting			
Others			

2.19 How much money did you get per season/year from other sources?

Source of income	Amount sold (bags/Kg/No)	Price per unit	Money obtained
Livestock sales			
-cattle			
-sheep/goats			
-chicken/poultry			
-other livestock			
subtotal			
Non agriculture income			
-informal sector			
-salary			
-remittances			
subtotal			
Grand total			

3.0 Spices marketing channels/patterns

3.1 What factors do you consider when deciding to sale spices?

1=The price offered 2=Person ties with the trader 3=Household cash needs

4=Need to repay back the loan 5=others (specify).....

3.2 To whom do you sale your spices?

1=Middlemen 2=Spices traders 3=cooperative Union

3.3 Do you find difficulties in selling your spices?

1=Yes 2=No

3.4 If yes, why?

1=The market is located very far from home 2=Few customers 3=Low demand
4=Low farm gate prices 5=Lack of transport facilities

3.5 What are the prices for the spices?

.....

.....

3.6 Are you satisfied with the prices?

1=Yes 2=No

3.7 If no,

why?.....

3.8 How well do you know about prices prevailing in the market?

1=Very well 2=Not very well 3=No idea except the middlemen's offer

3.9 How do you collect information on market prices?

1=direct visit to the market 2=crosscheck with many middlemen

3=Hear from neighbors and friends 4=Extension service including radio

3.10 How far is the marketing centre from your home?.....Km.

3.11 Where do you normally contact buyers?

1=At home 2=At cooperative society 3=At the buyers collecting centre

3.12 What are major spices marketing problems?

- I.
- II.
- III.
- IV.
- V.

3.13 What changes do you suggest to rectify the current situations?

- I.
- II.
- III.

IV.

V.

4.0 Credit availability

4.1 Is there any credit provided for spice production?

1=Yes 2=No

4.2 If yes, what is the source of the credit?

1=Bank 2=Traders 3=Other farmers 4=Cooperative union

5=others (specify).....

4.3 Does the credit facility give amount of credit requested?

1=Yes 2=No

4.4 Have you ever taken a credit?

1=Yes 2=No

4.5 If yes, did you repay the credit?

1=Yes 2=No

4.6 If yes, what was the repayment procedure?

1=In cash 2=In kind 3=Others (specify).....

4.7 If No, why?

4.8 From question 4.4, if No, why?

1=High risk 2=Low income obtained from spices 3=Not aware of credit facility

4=High interest rates 5=Lack of credit facility

4.9 On your own views do you think that credit is helpful?

4.10 If Yes why?

I.

II.

III.

IV.

V.

4.11 If No why?

I.

II.

- III.
- IV.
- V.

5.0 Producers association and extension service availability

5.1 Is there any association for spices producers?

1=Yes 2=No

5.2 If yes, are you a member?

1=Yes 2=No (If No, go to question...5.4.....)

5.3 What are the benefits for being a member?

1=Easy to market produce 2=Easy to get inputs 3=Easy to negotiate better price

4=Others (specify)

5.4 If No, what prevent you from joining or forming an association?

1=Few producers 2=No knowledge on dynamics of an association

5.5 Have you ever received an advice on spices production from an extension agent?

1=YES 2=No

5.6 If Yes, What kinds of services?

1=Growing of spices 2=Marketing of spices 3=Pests and diseases control

4=Others (specify).....

5.7 How many times per year/season did extension officer pay visit to you?

5.8 When did you receive an extension service for the last Time?

Date.....Month.....Year.....

5.9 How did you find the advice?

1=Adequate 2=Not adequate

5.10 Where do extension officers come from?

1=Government staff 2=Non government organization

3=others (specify).....

THANK YOU VERY MUCH FOR YOUR COOPERATION

Appendix 2: Traders' questionnaire

Marketing of spices in Morogoro Rural District

Questionnaire No..... Date of interview.....Interviewer's Name.....

Division..... Ward..... Village.....

1.0 Background information

1.1 Name of the respondent.....

1.2 Age of the respondent..... years

1.3 Marital status

1=Married 2=Single 3=Divorced 4=Cohabitation

1.4 Education level of the respondent

1=No formal education 2=Primary education 3=Secondary education

4=Post secondary education

1.5 Main occupation

1=Self employed 2=Farming 3=Unemployed 4=Employed

5=Others (specify).....

2.0 Trading and resource information

2.1 Type of trader

1=Wholesalers 2=Middleman 3=Retailer 4=Others (specify)

2.2 Years in the business..... Years

2.3 Nature of the business

1=Full time 2=Part time/Seasonal

2.4 What was your initial capital? (Tshs).....

2.5 Where did you get the initial capital to enter the spices trading?

1=From other traders 2=Borrowed from friends/relative

3=Borrowed money from bank 4=Money from farming

5=Money other traders 6= Others

2.6 Who buys spices for you?

1=Self 2=Family members 3=Agent

2.7 Do you normally know the price before taking the spices to the market?

1=Yes 2=No

2.8 Do you have any personal ties with those from whom you buy spices?

2.9 If Yes, what is the relationship?.....

.....

2.10 Do you have any association with other traders?

1=Yes 2=No (If No go to question.....)

2.11 If Yes, and you are a member what benefits that are obtained from the Association?

I.

II.

III.

IV.

V.

2.12 If No, what prevents you from forming or join an association?

1=Few traders 2=No knowledge on association dynamics

3=Others (specify).....

2.13 Do you some times by spices from farmers on credit?

2.14 If Yes, why?.....

.....

2.15 Do you own your own transport facility?

1=Yes 2=No

2.16 If No, how do you transport your spices?

Means of transport	Cost involved

2.17 Have you ever attended any commercial course?

1=Yes 2=No

2.18 Do you own a business license?

1=Yes 2=No

2.19 Have you ever acquired a credit for running your business?

1=Yes 2=No

2.20 If yes, what was the source of the credit?

1=Family member 2=Cooperative union 3=Bank 4=Other traders

5=Others (specify).....

2.21 Have you ever receive any assistance for your business?

1=Yes 2=No

2.22 If yes ,specify

Assistance	Institution	Activity	Condition(if any)

2.23 What are the most important problems that you face as a trader?

I.

II.

III.

IV.

V.

2.24 In your opinions what is the domestic market potentials for spices?

1=Quite big 2=Reasonably big 3=Quite small 4=Small 5=I don't know

2.25 What is the export market potential/

1=Quite big 2=Reasonably big 3=Quite small 4=Small 5=I don't know

THANK YOU VERY MUCH FOR YOUR COOPERATION

Appendix 3: Questions for guiding focus group discussion

1. How do you compare the importance of spices and other crops in this area?
2. How do you compare the spices yields of the last season and that of some few years in the past?
3. What are the major problems that inhibit production spices in these areas?
4. Is spices worth to cultivate?
5. Are there any local or foreign institutions assisting in the spices production or marketing?
6. Do you have any suggestion on measures to improve spice production?
7. Why most of households do not keep livestock?
8. Why women are not involved in spices trading to distant markets?
9. Who owns land among men and women in this area?
10. What types of institutions are available in this village/ward?
11. Why some of spices are not cultivated in pure stand as it is for cinnamon?

Appendix 4: Paired sample t test for comparison of income from spices and other sources

Paired sample t test

	Paired Differences						t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference					
				Lower	Upper				
Pair 1	Total earning from selling sploes - Income from selling crops other than spices	-103551.8750	476741.95070	53301.37047	-209645.5991	2541.8491	-1.943	79	.056

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