INSTITUTIONAL ARRANGEMENTS FOR SPECIALTY COFFEE: A CASE OF HAI AND MOSHI RURAL DISTRICTS, TANZANIA

BY

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ABSTRACT

This study aimed at assessing the institutional arrangements for specialty coffee in Hai and Moshi Rural districts in terms of marketing performance. The specific objectives were to; describe the existing institutional arrangements in the study area, investigate factors affecting yield of coffee, examine factors influencing coffee farmers' decision to participate in specialty coffee market and assess factors affecting the degree of coffee farmers' participation in specialty coffee market. Purposive, stratified and random sampling techniques were employed in data collection using structured questionnaires which was also supplemented by focus group discussions and field observations. About 250 coffee farmers were interviewed. Descriptive statistics, multiple linear regression analysis and probit analysis were used to analyse the data. Results showed that higher price and payment assurance were very important in influencing the institutional arrangement preferences by farmers. Income, tree density, delivery cost, labour, farmer training and age of coffee tree were statistically significant in influencing the yield of coffee. Investment cost was found to influence both yield and decision of farmers' participation in specialty coffee market. Other factors which were significant in determining coffee farmers' participation in specialty coffee market were technical assistance and market competition. Premium price, membership in group and transaction cost were significant in determining the decision to participate in specialty coffee market as well as the degree of participation. Further more, age of the household head, education and payment arrangements were also important in determining the degree of coffee farmers' participation in specialty coffee market. Recommendations put forward include; policy reinforcement to ensure enforceable contracts, supporting the establishment of input procurement system, designing mechanism of transportation of cherries from farms to the CPUs and facilitation of formation of FBGs in other crops to provide similar services to improve farmers' livelihood.

DECLARATION

I, Radegunda Francis Kessy, do hereby declare to the Senate of Sokoine University of Agriculture that, this dissertation is my own original work and it has never been nor concurrently being submitted for a higher degree award in any other University.

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19/11/2009

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DEDICATION

This work is dedicated to: The almighty God for his faithful guidance throughout my life, my parents, my brothers, sisters and friends for their material and moral support. I pray and trust that our almighty God shall bless them.

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ABRIVIATIONS

Cdf	-	Cumulative Distribution Function
CN	-	Conditional Number
CPUs	-	Central Pulpier Units
EAFCA	-	East Africa Fair Coffee Association
ENVIROCARE	-	Environmental Human Rights and Gender Organization
ESRF	-	Economic and Social Research Foundation
FBGs	-	Farmer Business Groups
FOs	-	Farmer Organization
GDP	-	Gross Domestic Product
HP	-	Hand Pulpier
IFAD	-	International Fund for Agriculture Development
IFOAM	-	International Federation of Organic Agriculture Movement
Kg	-	Kilograms
KILICAFE	-	Kilimanjaro Specialty Coffee Growers
KNCU	-	Kilimanjaro Native Cooperative Union
KVFA	-	Kagera Vanilla Farmers' Association
LPM	-	Linear Probability Model
LS	-	Lest Square
MLE	-	Maximum Likelihood Estimation
MVIWAMO	-	Mtandao wa Vikundi vya Wakulima wa Wilaya ya Monduli
MVIWATA	-	Mtandao wa Vikundi vya Wakulima Tanzania
NCA	-	National Coffee Association

NGO	-	Non Governmental Organization
NIE	-	New Institutional Economics
NSGRP	-	National Strategies for Growth and Reduction on Poverty
OLS	-	Ordinary Least Square
PADEP	-	Participatory Agriculture Development Program
PB	-	Private Buyers
SACCOS	-	Saving and Credit Cooperative Societies
SP	-	Specialty Coffee
SPSS	-	Statistical Package and Service Solution
SSA	-	Sub Saharan Africa
TaCRI	-	Tanzania Coffee Research Institute
TCB	-	Tanzania Coffee Board
TCCCO	-	Tanganyika Coffee Curing Company
TCE	-	Transaction Costs Economics
TCMB	-	Tanzania Coffee Marketing Board
TShs	-	Tanzanian Shillings
UN	-	United Nations
UNACTAD	-	United Nations Conference on Trade and. Development
USA	-	United States of America
UTR	-	United Republic of Tanzania
VIF	-	Variance Inflation Factor
WABOKASHA	-	Wakulima Bora wa Kahawa Shari

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background information

Three out of four poor people in developing countries lives in rural areas depending on agriculture for their livelihoods, either directly or indirectly (World Bank, 2008). Agriculture provides employments to the majority of the people who lives in rural areas and makes a significant contribution to the gross domestic product (GDP) and foreign exchange earnings. Because of its dominant role in the economy and societies of African countries, agriculture can be referred as engine of economic growth.

The economy of Tanzania is dominated by agriculture. According to the report by United Republic of Tanzania (URT), Agriculture contributes 44% of National Gross Domestic Products (GDP) and it is a principal export earner (60%) and employs 90% of the workforce (URT, 2007). Agriculture sector is comprised of two major sub sectors, which include crop and livestock sub sectors. The crop sub sector is further divided into three main categories that are export crops, food crops and non- traditional export crops. The primary aim of food crops is to satisfy food for domestic demand while the export crops are to generate foreign exchange through international trade. In Tanzania coffee, cotton, tea, sisal and pyrethrum belong to traditional export crops.

Baffes (2003) indicated that topography and climatic conditions of Tanzania, allowed the introduction of both Arabica and Robusta coffees in early of the 20th century. Coffee was introduced as an estate crop, but eventually became a smallholder crop. Arabica coffees are grown in the slopes of Mount Kilimanjaro, Arusha, Manyara, Mbeya and Ruvuma

regions while Robusta coffee is grown in the lake zone mainly the Kagera region. The area planted with coffee expanded significantly during the 1970s and the 1980s when prices were favorable. About 95% of coffee is grown by small scale farmers on average holdings of 1-2 hectares, while five percent is grown on estates.

1.2 Economic importance of coffee

Coffee has become the highest valued agriculture commodity in international trade. It is the second largest traded commodity (after oil) in the world (Amend, 2002). Most tropical countries produce coffee. Latin America accounts for 60% of global output, followed by Asia (24%) and Africa produces about 16% (Baffes, 2003). Coffee production grew by two percent during the 1970s and below two percent during the 1980s. In the early 1990s output was around 100 million bags with virtually no growth, but during the last four seasons global coffee output has averaged 113 million bags.

In Tanzania, coffee is one of the largest export crops, accounting for 32% of domestic export (URT, 2006). It is estimated that, about 2 million Tanzanians work directly in the coffee sector with more than 420 000 families depending on coffee as their major source of income (ENVIROCARE, 2005). Tanzania produces less than one percent of world output, whereby the two thirds is mild Arabica, and the rest is hard Arabica and Robusta (Baffes, 2003). Although Tanzania's share of the world total production is relatively small, coffee has made substantial contribution to the country's national economy.

1.3 Coffee marketing in Tanzania

Before market liberalization, the market for coffee was completely controlled by state organizations (Technoserve, 2006). Farmers delivered parchment coffee to primary

cooperative societies and received an initial payment based on a predetermined price (Amend, 2002). Parchment coffee was taken from cooperative societies to a coffee-curing factory by the state-supported cooperative union, which controlled the factory (Winter-Nelson and Temu, 2005). After milling and grading, coffee was then delivered to the Tanzania Coffee Marketing Board (TCMB), for further classification and attaches prices for specified grade. Private exporters were allowed to purchase through an organized and open auction. After subtracting the costs, final payments were made to farmers through their primary cooperative societies to cover the difference between their initial payments and the auction realization.

Other findings (Winter-Nelson and Temu, 2002; Baffes, 2003) have indicated that, TCMB was the only organization that could legally sell coffee or coffee inputs. Inputs were distributed through the cooperative unions and extended to farmers on credit at a negligible real rate of interest. In this system, the credit inputs and outputs transactions were linked. Since farmers had only one coffee outlet, cooperative unions could also extend crop-secured loans to them through their primary cooperative societies.

The established rural cooperatives had not fulfilled their role successfully because of the weakening factors which arising from the cooperative set up (Mbise, 2007). In 1976 the government abolished all cooperative unions and all post-harvest functions were handed over to the villages or the Tanzania Coffee Board renamed the Coffee Authority of Tanzania in 1977. This new structure performed no better, and in 1984 the government reinstated the cooperative unions and primary societies. Following the bad performance of these institutions, the government passed the Cooperative Act in 1991 which recognized the cooperatives as private institutions owned and managed by members. However, the

TCMB continue to keep its legal monopoly in selling coffee and providing inputs for coffee production as well as its regulatory, functions.

Widespread social and economic changes in the peasant society and in the regional society as a whole have led to a decline in coffee production, despite the fact that coffee is principal a cash crop (Minot 2007). A key impetus for the reforms in 1994 was the declining share of export prices received by coffee growers, whereby the average producer's share of Arabica export price in the nine seasons prior to the reforms was 60% (Baffles, 2003). Between 1998 and 2002 the farm gate price dropped from TSh.1300 (US$1.90) to TSh. 300 (US$0.40) per kilogram in the north-eastern zone of Tanzania (URT, 2006). This decline resulted from inefficient institutional arrangement that existed before 2004. The decrease in price lead to decrease in the production because farmers could not manage the production costs.

As part of broader macroeconomic changes, the existence of bad experience with coffee marketing institutions in the country, different market reforms have been implemented through reforming crop marketing and institutional set up. These reforms have opened a room for private sector activity in the market (Kilima, 1999). After market liberalization multi channel marketing system started and private buyers were permitted to compete with the cooperatives in the coffee market. Also, the government's reform lowered the farm-gate taxation and authorize premium coffee producers to sell directly to foreign buyers (Technoserve, 2006). The reduction of trade barriers and increase in market competition has opened some flexibility for small scale farmers to choose buyers for their coffee and suppliers of key inputs either through previous institutional arrangements (cooperatives) or other producer organizations.

The reforms have brought noticeable changes in the coffee industry. As pointed out by Baffles (2003). the share of export Arabica rose to 73% in the five seasons (tables 1 and 2). The operations of cooperatives in Tanzania started to diminish in some areas replaced by private traders (Mbise, 2007). Before 1994, 75% of coffee was marketed by cooperative unions, 19% by other government organizations, and six percent by private estates. Four seasons later the market shares for private traders rose to 67%, the share for cooperative union dropped to 26%, 7% by estates and 1% by other governmental organizations. The increase in quality and market competitions resulted in the increase in prices, tables (1 and 2).

Table 1: Auction sale and average prices from 2002/03- 2007/08

Year	Mild Arabica		Hard Arabica		Robusta	
	Kg	USD/50kg	Kg	USD/50Kg	Kg	USD/50Kg
2003/04	23 174 907	58.52	1 236 024	37.87	7 578 760	31.47
2004/05	26 127 465	86.22	3 148 198	64.93	24 405 898	34.01
2005/06	23 053 796	104.65	669 840	83.79	9 276 250	51.18
2006/07	30 838 132	108.18	1 506 600	68.03	18 958 680	63.61
2007/08	22 272 588	129.46	936 020	86.49	10 643 750	77.63

Source: TCB sales reports (2003/04 – 2007/08).

Table 2: Direct Export and average prices from 2003/04 -2007/08

Year	Mild Arabica		Hard Arabica		Robusta	
	Kg	USD/50Kg	Kg	USD/50kg	Kg	USD/50Kg
2003/04	723 840	93.34	-	-	-	-
2004/05	2 721 701	127.37	158 400	80.00	24 000	42.90
2005/06	2 172 512	146.77	554 400	75.66	-	-
2006/07	2 506 623	157.82	910 800	75.29	117 000	72.05
2007/08	4 057 056	167.66	651 720	82.41	4 962 300	80.23

Source: TCB sales reports (2003/04 – 2007/08).

Following the coffee sector reform, U.S Agency for International Development (USAID) have been able to transform Tanzania into one of the world's premium specialty coffee producing nations over the past eight years (Technoserve, 2006). Within this period of time, farmers started to export coffee directly to the buyers after improving the quality (Table 2). Price of speciality coffee rose from TSh. 1700 in 2003/4 to TSh. 2600 in 2007/8 season. Price of organic coffee to farmers rose from TSh. 1800 to 2203 between 2004/5 and 2008/9 while conventional coffee fetched between TSh. 1300 to 1719 (Mlaki and Machange personal communication, 2008). Also the price of conventional changed from TSh. 784.16 to TSh. 1750 in the similar seasons.

Tanzania like many other countries in Sub-Saharan Africa is still in the process of institutional reform in order to allow flexibility in business operations and therefore, foster strong economic growth and sustainable development (Isinika and Ashimogo, 2007). Despite the fact that the process of institutional reforms is ongoing, empirical data on better institutional arrangement for export crops especially high value crops is needed as it will act as a basis for formulating appropriate trading policies. The present study will examine the case of institutional arrangements for marketing of farm produce in the specialty coffee industry in Tanzania in order to provide understanding of the emerging institutional arrangement in coffee market.

1.4 Problem statement and justification

Following the opening of new markets for traditional exports such as coffees, (World Bank, 2008), Tanzanian farmers have increased the volume of organic and specialty coffee in some regions of Tanzania especially Kilimanjaro, Mbeya, Ruvuma, Arusha, Manyara and Kagera. One viable strategy for producers is to evolve new collective forms of

institutions that can help them to overcome problems facing the coffee industry as well as benefiting from better bargaining power in marketing their coffee and procuring production inputs. The new opportunities gave room to farmers to access both technical and financial support from different organizations interested in coffee industry.

In recent years the world demand for specialty coffees has skyrocketed (IFOAM. 2006). In Tanzania the number of farmers producing specialty coffee has increased as well as the volume of the produce in the last five seasons (Table 1 and 2). The increased demand for specialty coffee continues to necessitate a kind of institutional arrangement to farmers that will ensure products of high quality and delivered at required market standards. It also requires an institutional arrangement that will help to overcome problems that are faced by coffee farmers such as lack of access to market infrastructure. geographical isolation either due to remoteness or poor roads and poor communication systems among others.

Despite different market reforms in reviving the coffee industry. number of studies have attempted to assess the impact of premium prices to the livelihood of small scale coffee growers, compare the profitability of organic and conventional farming systems (Gibbon, *et al.,* 2009; Willer and Klicher, 2009), while others have attempted to compare transaction costs between users and non users of cooperatives in coffee industry (Mbise, 2007). However. there is scant information about the institutional arrangement in the specialty coffee industry. This particular study is aiming at contributing knowledge to the understanding of what institutional arrangement is important for the success of specialty coffee industry. The findings will help planners. policy makers and interested actors in coffee industry to create better trading conditions and improve exchange by lowering transaction costs.

1.5 Research objectives

1.5.1 General objective

The overall objective is to assess the institutional arrangements for specialty coffee farmers.

1.5.2 Specific objectives

i. To describe the institutional arrangement for specialty coffee in the study area.
ii. To investigate factors that affecting the yield of coffee in the study area.
iii. To examine factors influencing coffee farmers' decision to participate in specialty coffee market.
iv. To assess factors affecting the degree of coffee farmers' participation in specialty coffee market.

1.6 Hypothesis

i. Coffee yield is significantly influenced by factors such as income, tree density, investment cost, delivery cost, labour, farmer training and age of coffee trees.
ii. Farmer's decision to participate in specialty coffee market is significantly influenced by transaction costs, marketing environment and production costs.
iii. The degree of farmers participation in specialty coffee industry is significantly influenced by socio - economic factors, marketing environment and transaction costs.

1.7 Organization of the study

This study is organized into five chapters. The first chapter comprises the background information entailing the economic importance of coffee and coffee marketing. The second chapter dwells on the literature reviews from relevant sources. The third chapter covers methodology and chapter four presents research finding and their discussions. Conclusion and recommendations emanating from the research findings are given in chapter five.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Overview

This section presents definitions of terms and reviewed literature and findings of other studies in order to provide a theoretical framework which will guide the present study.

2.2 The concept of institution, institutional arrangement and organization

North (1990) indicated that, Institutions are the humanly devised constraints imposed for the purpose of governing the human interactions. Also, Institutions are set of formal (laws, contracts, political systems, organizations, markets etc.) and informal rules of conduct (norms, traditions, customs, value systems, religions, sociological trends etc.) that facilitate coordination or govern the relationships between individuals or groups. Institutions have an influence on human behaviour and expected results are; increases of economic efficiency, performance and development. Institutions can also affect the economic performance negatively, for example monopoly marketing by the state prior to market liberalization was a kind of institutions that affected agricultural marketing negatively. Also some of polices and laws are type of institutions that could affect economic performance negatively.

Institutions are seen as the rules of the game while organizations are considered as the players (North, 1991). Organizations are purposeful entities designed by groups of individuals to maximize their objectives defined by the opportunities afforded by the institutional structure. Farmer organizations (FOs) as an outcome of collective action are

unlikely to emerge on their own (Johnson *et al.*, 2002); therefore set up objective will determine the kind of organization that will come into existence.

As indicated by North (1990), Institutional arrangement refers to economic units that govern the ways in which these units can cooperate or compete. Cooperatives and FOs are institutional arrangements, the importance of which has re-emerged recently to organize small farmers in developing countries in the wake of agricultural market liberalization (Mbise, 2007). Cooperatives seem to be common FOs in Sub-Saharan Africa (SSA) established for the purpose of promoting production of cash crops by peasant farmers (Akwabi-Ameyaw, 1997).

2.3 The role of FOs in the development of agricultural sector.

Kaleshu *et al.* (2007) reported that, many government agencies developed national policies for rural development and designed a policy framework to help rural people become organized to facilitate the delivery of services through the various types of farmer organizations or groups. FOs provides multiple functions to markets; they transmit information, mediate transactions, facilitate the transfer and enforcement of property rights, contracts and manage the degree of competition.

FOs can be categorized into two categories for the purpose of better understanding. These categories include; resource orientated organizations and market orientated organizations.

(i) Resource-orientated farmer organizations

These are community based organizations such as cooperatives or associations dealing with inputs needed by the members to enhance the productivity of their businesses. According to Gupta (1985), resource oriented FOs are generally small, defined in specific

geographical areas and more concerned with inputs. The client group is highly diversified in terms of crops or commodities dealt with. The income generated by this kind of FOs from the sale of inputs and outputs can then be put back into the organization by spending on capacity building for members, business expansion and administration costs.

(ii) Market-orientated farmer organizations

They are designated as output dominated organizations. These organizations are also community based, specialized in a single commodity and opt for value added products which have expanded markets. They are not specific to single community therefore can recruit members across regional growers. Market oriented FO is relatively bigger compared with Resource oriented FOs and normally operates in a competitive environment.

Garforth (1993) reported that, farmers' participation and extent of participation in FOs is influenced by several factors. These factors cut across farmers' environment to the existing institutional framework at that particular time. These factors include;

- The degree of the farmer's dependence on the outputs of the organized activity.
- The degree of certainty of the availability of the outputs.
- The extent to which the outputs will be available only as a result of collective action.
- The extent to which the rewards associated with the collective action will be distributed equitably.
- The extent of availability of rewards within a reasonable time frame.

- Type of benefits that are expected including lower business transaction costs, better prices for inputs and outputs, empowerment and capacity enhancement which outweigh the associated costs of complying with collective rules and norms.

In many rural areas, commercial inputs are either unaffordable or smallholder farmers face high transaction costs, which further undermines their ability to use such inputs (Winter-Nelson and Temu, 2005). FOs can however facilitate access to input markets and service delivery, thus promoting commercial activities and technological change in agriculture (Kindness and Gordon, 2001).

According to Wennink and Heemskerk (2006) existing FOs in Tanzania play a role in innovation by linking community-based farmers' groups into larger networks and by representing their members in decision-making platforms on agricultural service provision. Tanzania has a wide variety of farmers' groups at the community level, through both farmer led initiatives and development projects. Example of these networks includes MVIWATA and MVIWAMO.

- **MVIWATA**; is the first farmers' network with a national coverage. MVIWATA links local farmers' groups in networks at different levels to enhance farmer representation and advocacy. Through training on leadership and communication they are now capable of defending members' interests and building partnerships with service providers supplying a wide range of services. Farmers have access to services such as input supply, credit facilities and marketing.

- **MVIWAMO**: is the relatively young, member district network in Monduli district under MVIWATA that aims to assist farmers' groups in networking activities. Farmers' groups are community based and their joint activities therefore have an out-scaling effect on the community. These groups are also trained in participatory assessment of problems and identifying solutions that lead to a wide range of services being provided to members.

As reported by Mutayoba (2005), Kagera Vanilla Farmers association (KVFA) is engaged in marketing of Vanilla in Bukoba district. KVFA plays a big role in buying the crops, giving loans and various agricultural inputs for vanilla, coffee, cassava, maize, beans and banana to farmers. Also it helps the community on other socio-economic aspects such as access to education and water supply.

The rate of success of these organizations is determined by their capacity to arrange for major investments and a continuous flow of raw materials. This requires the competent and convincing management of both enterprise and targeted members. If the profit generated is used to provide supplementary and supportive services at reduced cost, it can encourage members to use them although it requires a high calibre of representative and enlightened leadership from among the grower members. It is a challenging and demanding task to conceive, design, build, and nurture this type of FO. Also, the eexisting skills, experiences of members in relation to what is required to undertake joint activities, internal cohesion, membership driven agenda and the ability to effectively integrate into a wider commercial economy will determine the effectiveness of collective marketing activities (Bingen *et al.*, 2003).

2.4 Theories of transaction costs

This build a case on the basis of transaction cost economies to explain the role of institutional arrangement in improving market access. The use of transaction cost to match transaction characteristics and organization structure can be employed in the design or assessment of factors influencing farmer's decision to participate in institutional arrangement (Sechambo, 1993).

2.4.1 Transaction costs economics

According to the New Institutional Economics (NIE) approach, the unit of analysis is the transaction rather than the price (North, 1990). Transaction costs, which are distinct from physical marketing costs such as those for transport and storage, arise from the coordination of exchange among market actors. Transaction costs are unique to each market participant, implying that economic actors are not interchangeable (Williamson, 1993). The general hypothesis of transaction cost of the NIE is that, institutions are transaction cost-minimizing arrangements, which may change and evolve with changes in the nature and sources of transaction costs (Coase, 1988; Mbwana, 2007).

Transaction costs can influence the decision to participate in the markets as well as the level of participation (Williamson, 2000). These transaction costs results from the location of small scale farmers from service providers and consumers of their produce. The distance to the market together with poor infrastructure, lack of access to information is manifested in high exchange costs (Winter-Nelson and Temu, 2005; North, 1990). Transaction cost include also the cost that is hard to measure, such as time needed for queuing, bribery, as well as the losses due to imperfect monitoring and enforcement of contracts (Williamson, 2007).

North (1997), distinguished between the measurement and enforcement cost, that measurement cost is the cost of measuring the valuable attributes and characteristics of what is exchanged. This includes the costs of searching the right datasets and acquiring the information about the level of quality and usability for the specific application. On the other hand enforcement costs are those costs associated with protecting rights, policing and enforcing agreements. Resources are needed in defining, protecting, and enforcing the property rights to goods which have the right to be used, the right to derive income from its use, the right to exchange and uncertainty of one part to live up the agreement (North, 1991).

As observed by Sadoulet and de Janvry (1995), Transaction Cost Economics (TCE) is especially relevant for agricultural market analysis in developing countries and the changes in the agricultural sector in general. This follows the facts that many institutions, or formal rules of market behaviour that facilitate market exchange in developed countries are absent in low-income countries. It is hypothesized that high transaction costs as a result of poor institutional arrangements are the causes of low market participation of small scale farmers in developing countries. Considering transaction cost as a unit of analysis, it implies that transaction costs economics can potentially offer useful insights to development of agricultural policy in the developing countries.

2.4.2 Determinant of transaction cost

The exact institutional form that will be preferred in a specific transaction situation is a decision variable that is dependent upon the type and magnitude of transaction friction that are to be overcome. According to Shechambo (1993), there are three determinants of

transaction costs, which interact with the surrounding environment. These are uncertainty, asset specificity and frequency (repetitiveness);

- **Frequency** refers to the rate at which transactions have to be repeated. The more the frequency the higher the costs. Transaction costs can be minimized by designing or choosing appropriate institutional arrangement.

- **Uncertainty** refers to existence of unknown variables or disturbances in the transaction atmosphere that make the transaction more complex. Uncertainty occur when the two parties lack the ability to acquire and process adequate information before committing themselves to decision. Certainty is the most important component of social capital within every commercial transaction and it can build when transaction is conducted over a period of time because of personalized transaction which leads to increased trust between the actors and opportunism declines (Slangen *et al.*, 2004).

- **Specificity** Certain types of equipments, materials and knowledge have potentially generalized use across a broad range of products or trades. Other assets are highly specialized and therefore have no alternative use or value should a production scheme fail or trade relationship break down. The common forms of specific assets are physical assets, site assets, dedicated assets, brand name capital and temporal specificity (Williamson, 1993). Most coffee processing plants have specific use e.g. coffee pulping and curing plants are specific to coffee only. Any other use is either impossible or may need a big cost for modification. Also at farm level knowledge such as picking the right cherry, washing, drying and storage facilities are specific knowledge and practices

(Moss *et al.*, 2003). Land planted with coffee can have alternative use or vertical integration such as intercropping can be done to reduce this kind of transaction cost.

According to Isinika and Ashimogo (2007), the sustainability of institutional arrangement is attained by reducing transaction cost, internalizing externalities, increasing specialization and redistribution of assets to increase productivity, which is achieved through product and process of specialization with greater linkages between actors including producers and consumers. New kinds of institutional arrangements are highly needed to reduce these costs and fill the vacuum left when governments withdrew from markets in the era of structural adjustments (Shiferaw *et al.*, 2006).

2.5 Coffee processing, grading and classification

Coffee harvests depend on when the previous rainy season began and when a particular field received enough rainfall to initiate flower blooming. In many countries, the ripe cherry is picked by hand. As observed by NCA (2004), mechanized process is found only in certain areas with relatively flat landscapes and large coffee fields, such as certain locations in Brazil. The same observations states that, whether harvesting is done by hand or by machine, all coffee is either 'strip picked,' in which the entire crop is picked at one time, or 'selectively picked,' in which only the dark red ripe cherries are picked, and the harvesters rotate between the trees every 8 - 10 days.

Coffee processing refers to all the operations carried out on the crop from harvesting up to the point of delivery to the market. Improper treatment of coffee during on-farm processing has significant impact on the quality of coffee (Temu, 1999). Harvesting task

must be done carefully to ensure that only the red ripe cherries are picked. Cherries that are not well ripe or overripe will lower the quality of the coffee at sale (Neilson, 2007). A delay of even one day between harvesting and processing of the cherries can have a significant effect on coffee quality (Amend, 2002). Coffee is processed using either the dry or wet method, depending on local resources (NCA, 2004).

In the dry method, the freshly picked cherries are spread out on large surfaces and dried in the sun. They are turned frequently, and covered at night or if it rains. When the moisture content falls below13%, the dried cherries are hulled to expose the beans and stored ready for sell. The dry method is less expensive, and less polluting. but is usually used for lower quality beans (Amend, 2002).

Wet method consists of removing the beans from the cherries (pulping), followed by soaking the beans in water to remove the mucilage that clings to the parchment, the process known as fermentation. Pulping can be done in Hand Pulpier (HP) or in Central Pulping Units (CPUs). The removed pulp is often dried and used as mulch in coffee farms for future coffee crops. Fermentation is done in plastic buckets or drums, wooden drums, aluminium pots for 12 to 48 hours depending on altitude and climate (Amend, 2002). Drying is performed by spreading the wet coffee on burlap sacking, reed mats, or woven bamboo screens and under the sunlight. The drying process continues until the moisture content is between 10 and 13%. This normally takes approximately two weeks, but the length of drying can vary widely depending on the weather (Amend, 2002). At this point the dried beans are known as Parchment coffee.

Before export, parchment coffee is machine hulled (to remove the parchment layer) and sometimes "polished" to remove any remaining skin and improve quality. According to Holly (2004), Coffee is graded by a set of characteristics peculiar to each producing country. The characteristics by which most coffee is graded are appearance (bean size, uniformity) and density. According to Tanzanian grading system, there are about 10 grades (AA, A, B, PB, E, AF, TT, C, F, Tex). The first four are the main grades and normally distinguished by bean size, higher density and uniformity. The next six grades are known as lower grades and distinguished from the main grades with the lesser density of the beans.

The classifications of grades and the descriptive terminology differ from country to country. The sample of beans is normally judged according to the country's standards, and the sack of beans from which the sample was taken and given a quality rating; good or bad, depending on the outcome of the assessment. Classification is based on number of defective beans per sample, cup quality, which includes flavour and whether the beans roast well and evenly. Classification is done through liquoring process which classifies different grades into quality classes (Temu, 1999). Tanzania classification system has 17 classes for the coffee grades, ranging from fine to 'very poor and unclean'. Quality classes are highly correlated with grades; for example grades such as AA, A, are found in good liquor classes 1-5, while low grades such as F are found in poor liquor classes 9 - 10. According to TCB (2006), only 1.7 per cent of coffee in Tanzania is classified in higher quality classes which are also designated as specialty coffee (best quality) in Tanzania.

The concept of specialty coffee includes the care given to the plant through harvest and preparation for export. Likewise, there are regions that have proven their ability to grow

great coffees due to altitude, latitude, soil and other attributes (Donnet *et al.*, 2007). Specialty has become a generic label covering a range of different coffees, which either commands a premium price over other coffees or that are perceived by consumers as being different (UNCTAD, 2002).

Within specialty coffee industry, there is a growing recognition and increasing market value for sustainable coffee. The concept of sustainability in this realm includes various aspects referred to as economic viability for farmers, environmental conservation and social responsibility. Some of these coffees are sold as certified coffee for stance organic coffee, "Bird-friendly," "Rainforest Alliance-certified. Fair Trade, and Utz Kapeh (Ponte, 2004).

Classification of specialty coffee is based on the numbers of defects per 300 grams of coffee beans as follows:

- **Specialty grade green coffee:** Specialty green coffee beans have no more than 5 full defects in 300 grams of coffee. No primary defects are allowed. A maximum of 5% above or below screen size indicated is tolerated. Specialty coffee must possess at least one distinctive attribute in the body, flavour, aroma, or acidity. Must be free of faults and taints, no quakers are permitted and moisture content is between 9-13%.

- **Premium coffee grade:** Premium coffee must have not more than 10 full defects in 300 grams. Primary defects are permitted. A maximum of 5% above or below screen size is tolerated. Must possess at least one distinctive attribute in the body,

flavour, aroma or acidity. Must be free of faults and may contain only 3 quakers. Moisture content is between 9-13%.

2.6 Review of empirical studies

Probit and Logit models have been proposed to be adequate techniques for addressing probability questions (Goetz, 1992; Makhura, 2001). They argued that Tobit is a hybrid model between the Logit or Probit and the OLS. A Tobit model can be used to answer question like i) What factors determine the level or size of sales (OLS can be used), ii) What factors influence the probability of selling. (Logit and Probit can be used).

According to Scott (1995) probit model was used to analyse the determinants of the adoption of new cash crops among the smallholder farmers. Probit model was formulated to examine what farmers and household characteristics were associated with the adoption of certain crop mix patterns. The coefficients obtained were multiplied by 0.4 when converted to approximate linear probability estimates.

Winter-Nelson and Temu (2005) used probit model to analyze the roles of relative prices and transaction costs in explaining low use of chemical inputs among Tanzanian coffee growers. It was argued that probit and logit model are specified to explain whether or not farmers use a given input though it doesn't tell the extent of use. Probit model was improved by generating of inverse mills' ratio used in a separate regression to explain the intensity of use of chemical fertilizers among coffee growers.

Scott (1995) used Tobit model to analyze and modelling the effects of transaction costs on an economic activity. In reviewing the Tobit estimation he argued that unlike OLS

method, the Tobit methods yield unbiased coefficients estimates for regression in which the dependent is censored. The selectivity model was used to improve Tobit model in cases where the decision of an individual to carry out an activity (such as buying fertilizer) willingness is influenced by non-random and an observable factors such as willingness in bearing risks.

Probit model allows the dichotomous dependent variable and error term to follow the normal distribution. Logit model requires the dependent variable to be dichotomous and error term should follow the logistic distribution. Based on the previous studies and the present study, probit model will be employed to determine factors influencing household decision to adopt specialty coffee marketing channel and the effects of institutional arrangement on the level of marketing transaction cost.

2.7Probit model

According to (Hawassi, 2006; Makhura. 2001 and Goetz. 1992). Probit model is one of the popular models applied in the estimation of qualitative dependent variable. It provides greater reliability and statistical sophistication in analyzing choice decisions. Probit model is more appealing than LPM, partially because it accounts for heteroskedasticity of the error terms restricting prediction to lie between 0 and 1. The probability of participating in a particular market in the probit model is defined in terms of an index that may have a value between negative and positive. This index is converted into probability values by using standard normal cumulative distribution function (cdf), which is expressed as an integral and this transformation guarantees that all corresponding probability values are confirmed between 0 and 1. Also economists tend to favour the normality assumption for error term; as such the probit model is more popular than logit in econometrics. The following Chapter will present model specifications.

CHAPTER THREE

3.0 METHODOLOGY OF THE STUDY

3.1 Overview

This chapter describes the methodology that was used in conducting the study. It is divided into seven sub-sections; 3.2 cover the conceptual framework governing the study; 3.3 describe the study area, followed by justification of study area. Section 3.4 describes the research design and sampling procedure chosen for the present study. Sections 3.5 and 3.6 shows sources and types of data collected and various analytical methods employed in the study respectively. The final section presents the problems encountered in conducting the survey.

3.2 Marketing channel conceptual framework for coffee

The study used a modified conceptual framework from that developed by Baffes (2003). The conceptual framework illustrates that FBGs and cooperatives serves as marketing agents facilitating both production and marketing services (fig. 1).

Specialty Coffee farmers delivers their cherries to CPUs for pulping, fermenting and drying and later transported to curing factory for hulling and grading. KILICAFE take samples to TCB for classification and lastly exported to the buyers. Conventional and organic coffee farmers process their cherries in their home (pulping, fermentation washing and drying) and then collected by primary cooperatives or private buyers, transported to curing factory (for hulling and grading) and later Union take samples to TCB for classification and auctioning. The choice of institutional arrangement for coffee farmers is influenced by household characteristics, transaction costs, market information and price of coffee.

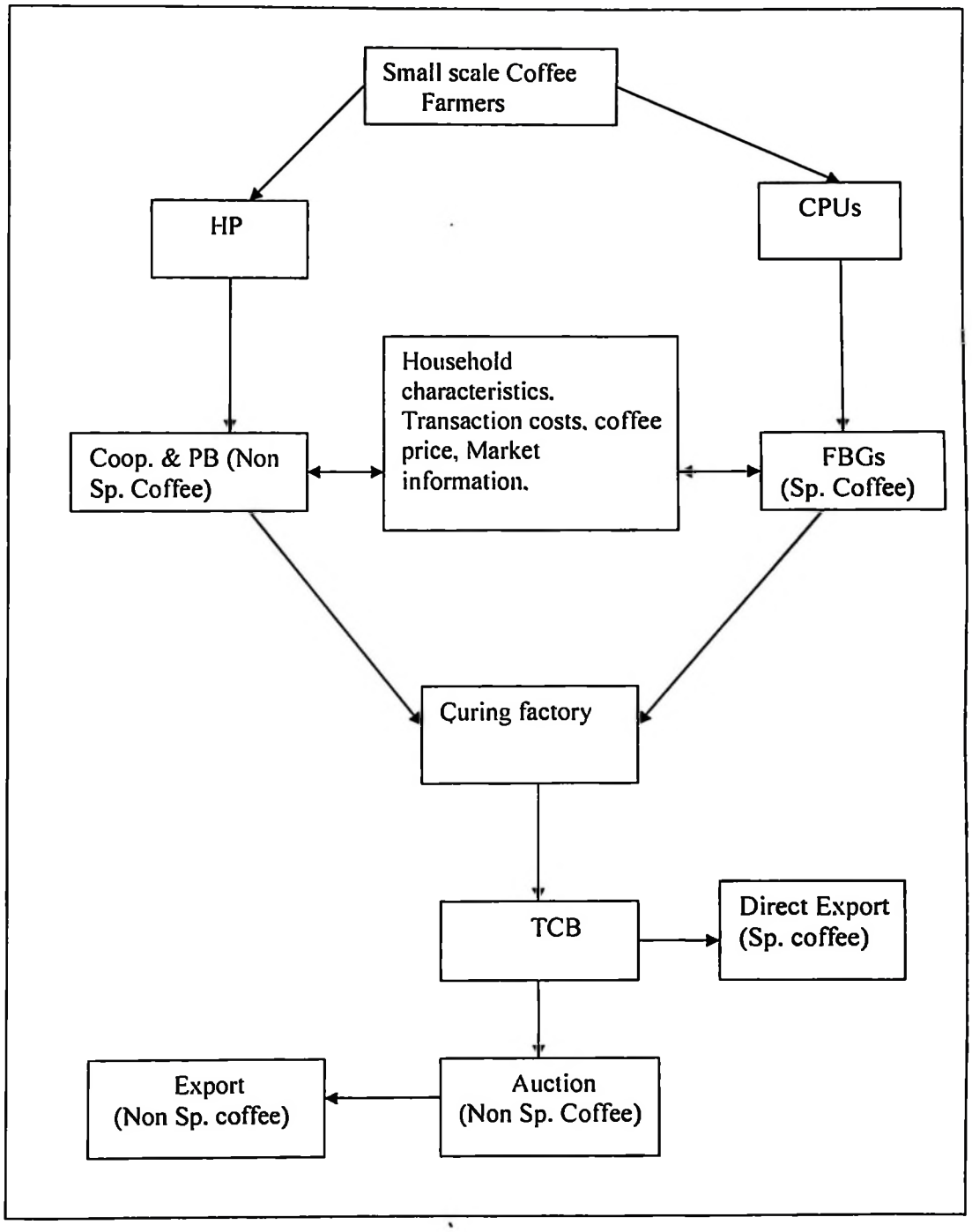

Figure 1: Conceptual framework . Adopted and modified from Baffles (2003).

3.3 Description of the study area

Hai and Moshi Rural districts in the northern part of Tanzania are among the seven districts of Kilimanjaro region. Other districts are Rombo, Same, Mwanga, Moshi Municipal and Siha. Kilimanjaro region is situated between $2^{0}25'$ and $4^{0}30'$ latitude south of equator and $36^{0}25'$ to $38^{0}18'$ East longitude.

3.3.1 Moshi Rural district

The district situated between $3^{0}15'$ and $3^{0}45'$ latitude south of equator and $37^{0}00'$ to $37^{0}37'$ East longitude, (Fig. 2). Moshi Rural district is bordered by Hai district in the west, Rombo district in the north and east, Mwanga district in South-East and Arusha Region on South-West. According to the 2002 National Population Census results, the district population is about 167 097 (85 044 males and 82 053 females) (URT, 2002).

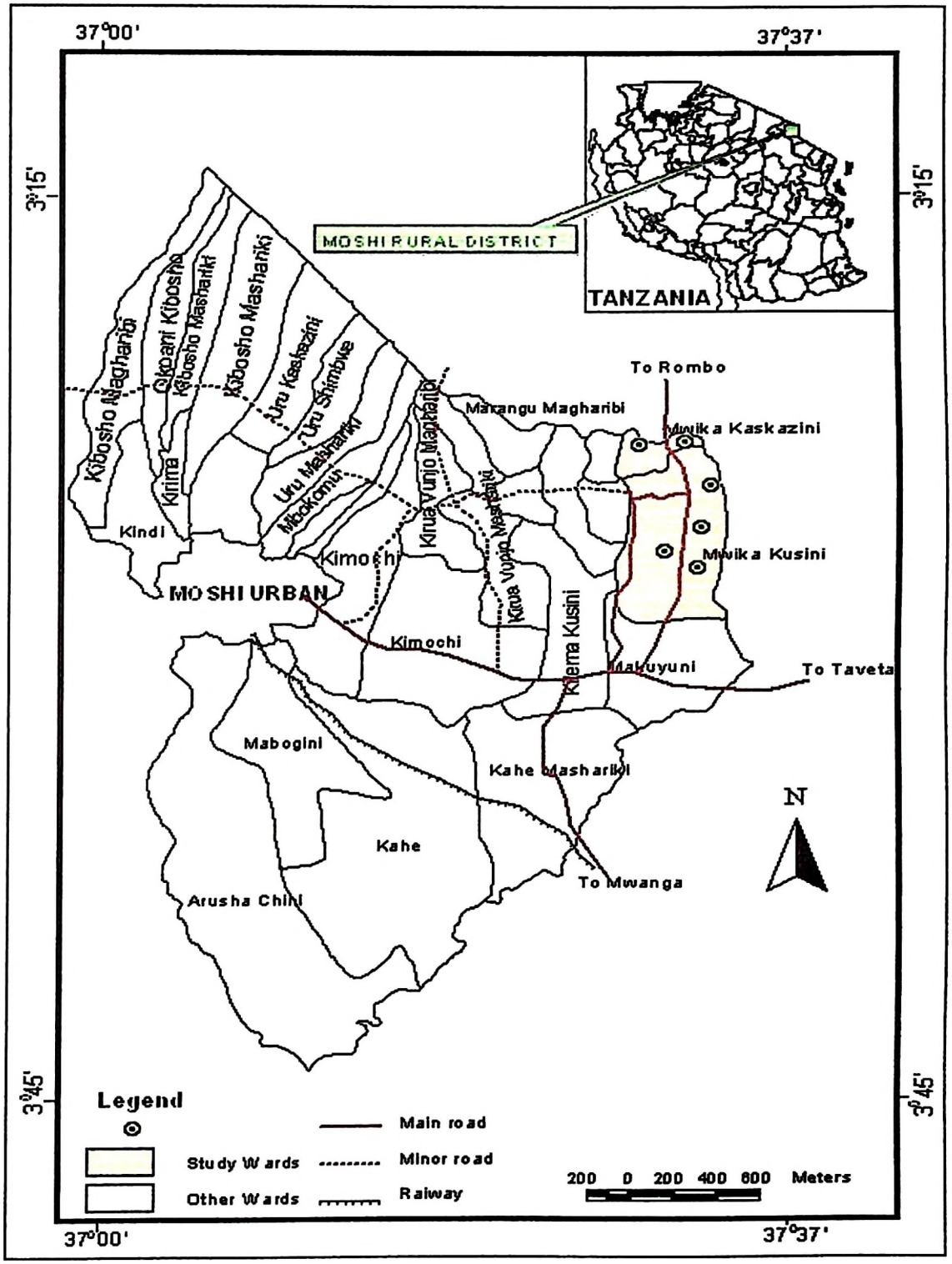

Figure 2: Map of Moshi Rural district showing location of study villages

The altitude in the district ranges from 900m in the low land to 5895m above sea level at the pick of Mount Kilimanjaro. However human settlements are limited to not more than 2000m above sea level. Forests and national park reserves dominate the altitude ranging 2000m and above. The temperature ranges from $15^0C - 25^0C$ while rainfall distribution ranges between 700 to 2000mm per annum.

The land area is estimated to be 1713 sq. Km. The farming system in Moshi Rural district can be divided into three sectors; first the high lands farming system, second the lower lands farming system and three livestock farming system. The latter is carried out in the upper belt of the district and is dominantly stall-fed cattle keeping with milk and manure being the major products. In the high land areas where rainfall is more reliable than in the lowlands, the dominating crops are coffee, bananas, beans, Irish potatoes, vegetables and cocoyam. Pure coffee stands are confined to the estates or in much higher altitudes where it is too cold for bananas. In the upper land fields, beans are grown normally on the field edges and in case of cocoyam along the irrigation channels. Guatemala grass is also grown on the field margins. Apart from traditional crops, fruits and lumber trees are increasingly becoming an important component of the highland field crops. The lower land areas receive less rainfall than high lands and main crops are maize, beans, sunflower and paddy, vegetables and sugar.

The soils in the highland areas are volcanic, fertile and black, derived from volcanic larva and ash and can support intensive cultivation. In these areas soil fertility is maintained by constant manuring and incorporation of crop residues largely from banana cuttings. Lowland areas are characterized by soils of moderate fertility which require constant fertilizer application in order to achieve reasonable crop output. Apart from the low

fertility, the soils in the lower areas have been continuously cultivated and are more prone to wind and water erosion.

3.3.2 Hai district

The district is situated at situated between $2^0 45'$ and $3^0 5'$ latitude south of equator and $37^0 00'$ to $37^0 28'$ East longitude (Fig. 3). Hai district is bordered by four districts: Moshi rural on the east, Simanjiro of Arusha Region on the south, Arusha regional on the West and North-East; Republic of Kenya and Rombo district on North and North East respectively. The population is estimated to be 85 044 males, 82 053 females total 167 097 from 2002 national Census.

Temperatures are also closely related to altitude. But between 700m and 1200m above mean sea level the variation in mean monthly temperature is small (22- 26°C). The hot season last from October to March and is accompanied by high humidity with maximum temperatures of 35°C. The cold season starts from June to September; it has monthly temperatures in the range of 18 to 22°C. The annual rainfall ranges from 700 – 2000mm per annum.

The survey conducted in 1984 indicated that the median farm size in the highland zone is 1.01 hectares, while in the lowland zone is 1.2 hectares. The average distances from the homestead to the lowland farms are 18 km (Urio and Mlay, 1984). The highland zone has relatively more rainfall and the cropping pattern is coffee with bananas as main crops. Other crops in the highland zone include vegetables, animal fodders, timber trees and fruits. The lowland zone is cropped with maize and beans either as pure stands or intercropped.

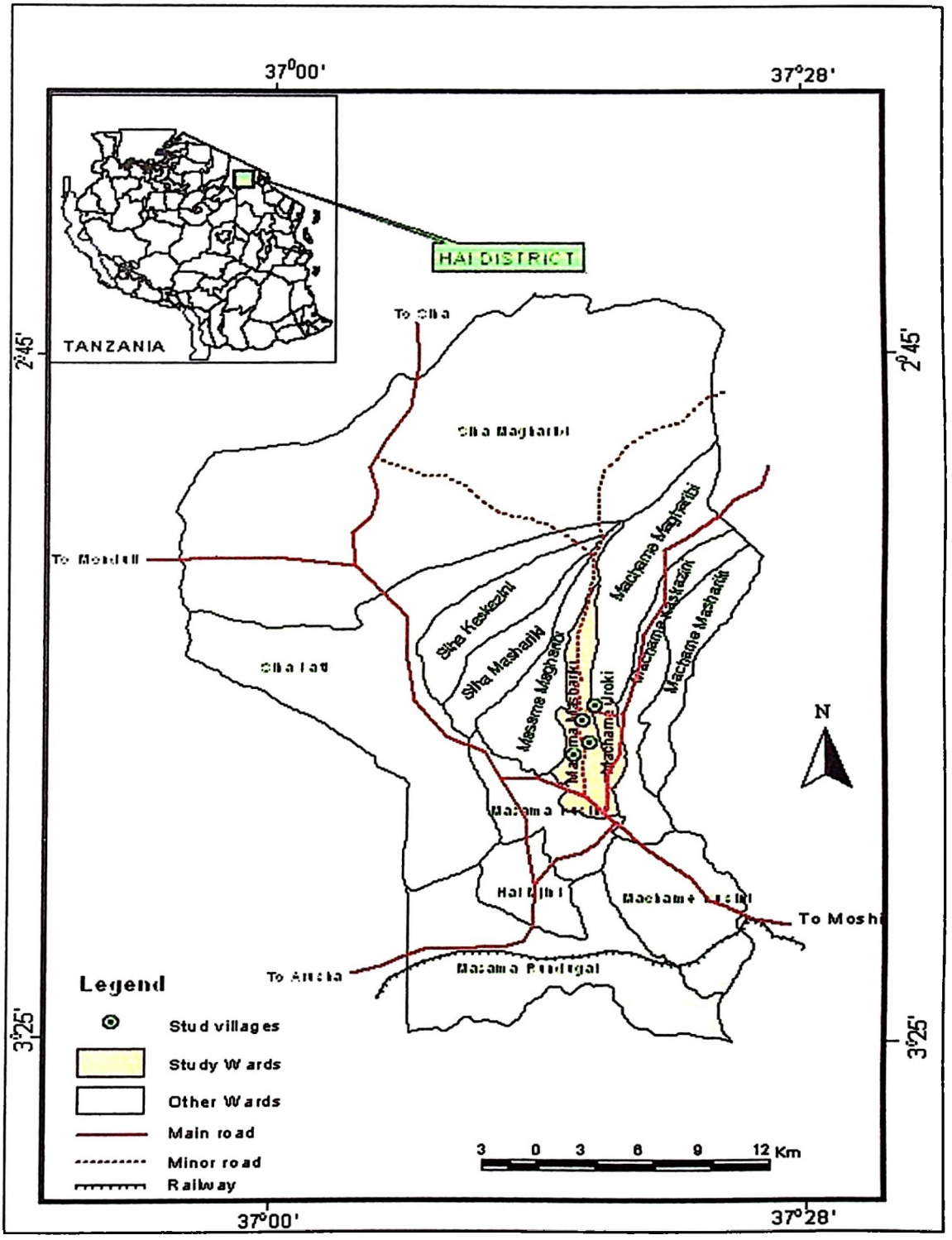

Figure 3: Map of Hai district showing location of study villages

3.3.3 Justification of the study area

Agriculture contributes about 69.2% of all GDP earnings in Kilimanjaro region; Moshi Rural, Hai and Rombo districts accounted for about 75.8% of regional GDP (URT, 2002). Coffee is important permanent crop grown mainly by smallholder farmers in Kilimanjaro accounted for 26.3% of total crop grown by household. (URT, 2007). Production of coffee differs by volume from district to district. (Table 3); Moshi Rural, Hai and Rombo districts being the mainly producers.

Table 3: Production of coffee by district distribution in Kilimanjaro Region

1998/99 – 1999/2000 (Tons)

District	1998/99	1999/00	2000/01	Total	Yearly tons	%Regional
Moshi Rural	2 341	6 325	4 458	13 124	4 375	43
Hai	1 353	2 587	4 172	8 112	2 704	27
Rombo	1 604	2 846	2 723	7 173	2 391	24
Mwanga	168	216	381	765	255	3
Same	210	540	189	939	313	3
Total	**5 676**	**12 514**	**11 923**	**30 113**	**10 038**	**100**

Source: URT, 2002.

Apart from long experience in coffee production, the two districts (Hai and Moshi Rural) were purposively selected for this study because there was more active specialty coffee farmers compared with other districts in the region.

3.4 Research design and sampling procedure

(i)Research design

The study used the cross-sectional research design. Under this design data from respondents were collected at a single point in time without repetition from the

representative sample. The reason behind the choice of this design is relatively cheaper to conduct in terms of time, resources and can allow comparison of variables from the two groups; specialty and non specialty coffee farmers.

(ii) Sampling procedure

Nine villages were selected purposively from Moshi rural and Hai Districts. The choice of the villages was based on the accessibility but also resources limitations. The selected villages includes Kimangaro, Mawanjeni, Kiruweni (Mwika South ward); Mrimbo Uwo and Lole Marera (Mwika North ward) from Moshi Rural district. Others include Shari (Machame Uroki ward), Mudio, Mbweera and Roo (Masama East ward) from Hai district. The sample population for this study involved specialty and non specialty coffee farmers. The process of data collection for this study was organized to involve specialty and non specialty coffee farmers, primary cooperatives, representatives of farmers' groups and other institutions dealing with coffee in the area.

Since a population from the study area does not constitute a homogeneous group, stratified sampling technique was employed to obtain a representative sample. Specialty and non specialty coffee farmers comprised two homogenous strata (groups). Random sampling technique was also applied in order to get a good representative sample of 250 respondents.

3.5 Data collection

Both primary and secondary data were collected for this study.

3.5.1 Primary data

Primary data were collected through interview schedule, focus group discussion and field observation for both specialty and non specialty coffee farmers; and representative from institutions dealing with coffee in the study area. Structured Questionnaires were the main instruments employed in primary data collection. Both open and close ended questionnaires were designed and pre-tested to 10 coffee farmers who were selected randomly. The pre-testing was conducted to crosscheck the reactions of the respondents towards sensitive and ambiguous questions. Also to ensure clarity, meaningfulness and comprehensiveness of the data to be collected for this study. Types of information collected from the survey were; coffee prices, social economic characteristics of coffee farmers, costs associated with accessibility to coffee markets, production costs and institutions available for coffee marketing.

3.5.2 Secondary data

Secondary data such as coffee prices (direct export and auctions), production records, information about coffee dealers, records of groups' activities and events over time, were obtained by consulting different sources such as; village Government, Ministry of Agriculture Food Security and Cooperatives, TCB, KNCU, TaCRI, internet and libraries.

3.6 Data analysis

Both descriptive and quantitative analyses were carried out. The data obtained were summarized, coded and transferred to computer sheets for processing. The computer programs such as SPSS version 12 and Stata version 6 were used to carry out the analysis.

3.6.1 Descriptive analysis

Statistics such as means, frequency, percentages, and cross tabulation were used to show the trends of the data from the sample. Cross tabulation analysis was used to segregate respondents characteristics based on criteria such as education, age and coffee prices paid from different institutional arrangements.

3.6.2 Multiple linear regression model

Multiple linear regression models were employed to study two different relations in this study as it is described in i and ii.

(i) First, to predict the relationship between coffee yield as dependent variable and independent variables such as premium price, investment, delivery cost, labour, size of coffee plot, technical assistance and age of the tree. Four models were estimated to capture the variations between specialty, conventional and specialty, conventional and organic coffee farmers. The estimated model is as follows:

$$Y = f(X_1, X_2 \ldots\ldots X_n)$$

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \varepsilon$$

Table 4: Description of the variables influencing level coffee yield

Variable name	Variable description
X_1=Average income	Expected sign is positive. Income is taken as a product of average coffee price and average yield of a farmer. Good returns from coffee will motivate farmers to reinvest in to coffee production.
X_2= Investment	Expected sign is positive. Well managed farm is expected to yield higher than less managed farm.
X_3= Delivery cost 2007	Expected sign is negative. The increase in delivery cost discourages farmers to increase their investments in coffee because returns will decrease.
X_4 = Labour 1= 18-60 years old 2= Others	Expected sign is positive. A household with members of the age between 18 -60 years old comprise the labour force. Coffee yield is expected to increase with the increase in labour force within the household level.
X_5= Tree density	Expected sign is positive. The number of trees per unit area of land will have a positive influence on coffee yield. Therefore a farmer who has higher tree density is more likely to get more yields.
X_6 =Farmer training	The expected sign is positive. Frequent trainings to farmers impact knowledge and skills of good husbandry practices on crop production. The yield of coffee is expected to increase with the increase in frequency of trainings.
X_7 = Tree age	The expected sign is negative. Aged coffee trees are expected to yield less then younger ones.
α $\beta_1 \ldots . \beta_7$ ε	Constant Regression parameters Error term.

(ii) Second, to determine the degree of participation in specialty coffee marketing whereby, Ordinary Least Square (OLS) technique was used in estimating the model. OLS makes use of least square (LS) to be consistent (Pindyck and Rubinfeld, 1991). The dependent variable was taken as a ratio of specialty coffee to the total yield of coffee. The independent variables were added in stepwise at the same time observing the value of adjusted R^2. Those variables which proved to improve the value of adjusted R^2 where maintained as explanatory variables in the model. The specified model is as follows;

$$Y = f(X_1, X_2 \ldots\ldots X_n)$$

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \varepsilon$$

Table 5: Description of factors affecting the proportion of specialty coffee in the market

Variable name	Variable description
X_1 = Premium price	Expected sign is positive. Premium price is taken as a different between specialty and conventional coffee price. Premium price will motivate farmers to increase the share of specialty coffee in the market.,
X_2 = Price information (Dummy, 1= Yes, 0 = No)	Expected sign is positive. It is expected that farmers will respond much to the market in which they are informed about.
X_3 =Age category 1= younger age 2= older age	Expected sign is negative. Aged farmers are not risk takers. It is expected that younger and medium farmers will sell bigger shares of specialty coffee than aged ones.
X_4 = Education	Expected sign is positive. Education was measured as number of years spent in school. Educated farmers are expected to sell bigger shares of specialty coffee than non educated farmers because they can easily access and interpret market information.
X_5 =Time spent to reach market	Expected sign is negative. Distance between production points to the selling point will discourage farmers to opt for the particular market.
X_6 = Frequency of selling coffee	Expected sign is positive. The share of specialty coffee will increase with the increase in delivery trips.
X_7 = Payment period	The expected sign is negative. Delay in payment is expected to discourage farmers to increase the degree of participation in specialty coffee market.
X_8 = Percentage of red-rip cherries	The expected sign is positive. The increase of red picked cherries will increase the share of specialty coffee.
X_9 = Contract	Expected sign is positive. It is expected that farmers who are under contract will deliver larger shares of specialty coffee than others.
X_{10} = Membership in group (Dummy)	Expected sign is positive. Members of the group are expected to sell larger shares of specialty coffee than others.

3.6.3 Probit model

Probit model were employed to determine factors influencing coffee farmers' decision to participate in specialty coffee marketing to answer objective 2. The assumption made is that the error term is independently and normally distributed for the binary outcome of dependent variable. (Pindyck and Rubinfeld. 1991). Z = probability of participating in specialty marketing (1=specialty. 0= otherwise). The specified model is as follows:

$$\textbf{Prob } \{(1-p)\} = Z = \alpha + \Sigma\beta_1 X_1 + \ldots\ldots\ldots\Sigma\beta_9 X_9 + \varepsilon$$

Pi ranges between 0 and 1 and is non -linearly related to Z therefore Ordinary Least square (OLS) can not be used to estimate the parameters. Following this, the model was estimated using Maximum Likelihood Estimation (MLE). Multiple correlation matrixes were used to test multicollinearity.

Table 6: Description of the variables influencing coffee farmer's decision to participate in specialty coffee market

Variable	Description of variables
Age category 1=Younger age 2= Medium age 3=Older age	The expected sign is negative. Aged people are not the risk takers. So they will not be involved in the new marketing arrangement.
Education 1=Non formal Education 2=Primary Education 3= Tertiary Education	Expected sign is positive. Education level is important for the producer to interpret and analyse market information as well as forecasting the future of the new marketing arrangement in the study area.
Frequency of selling	The number of deliveries indicates the readiness for the market to buy and cash flow. More frequencies of selling need more resources hence more transaction costs On overall the expected sign is ambiguous.
Coffee price	This variable is expected to have a positive coefficient since farmers would like to get good price for their products. Therefore they will respond positively to the good price.
Remoteness	Distance between the production points to the selling point has got an effect on the farmer's returns. As distance increases also the delivery cost increases. It is expected to have a negative coefficient.
Price information	Information on market plays an important role on the decision made by producer. It is expected that farmers will adopt quickly as they are informed. In this case this variable is expected to have a positive coefficient.
Trust	Trust reduces uncertainty in any business as it reduces transaction cost between the trading parties. This variable is expected to have positive coefficient.
Asset specificity	As a resource become more specific to the kind of transaction, it increases the transaction cost. In this case land is expected to have other alternative uses competing with coffee production; therefore the coefficient is expected to be negative.

3.7 Problems with cross-sectional data

Two problems normally exist within cross-sectional data. These problems are multicolinearity and heteroskedasticity.

Multicolinearity occurs when two or more variables are highly positive correlated. The problem of multicolinearity was tested by the values of Variance Inflation Factor (VIF). By a rule of thumb VIF of 5 or greater or if conditional number (CN) is greater than 20 it indicates severe multicolinearity. In this case the VIF was below 5.

Heteroskedasticity occurs when the variance of error term is not constant and in turn results into larger standard errors of parameter estimates, depressed t- values and hence rejection of many hypotheses unnecessarily. The heteroskedasticity problem was taken care by transforming the equation into logarithmic form.

3.8 Limitation of the data

Limitation for this study emanated from data collection exercise (field work) and lack of transparency from the respondents. These components are further discussed bellow.

(i) Data availability and reliability

The common weakness for Tanzanian farmers is lack of reliable sources of their farm records. In this case responses depended on their recalling capability. To minimize the seriousness of the problem, one day seminar was conducted to equip enumerators with knowledge on how to assist farmers to remember the past events. Also focus group discussions were used to cross check the findings from individual respondents.

(ii) Lack of transparency

Although the objectives and advantages of the survey were clearly explained to the respondents, some farmers were not ready to disclose some information especially about coffee yield and production costs. Some farmers lied because they thought the survey was conducted to identify areas which need interventions. Again group discussion brought insight on the collected data and field observations was also conducted by enumerators to cross check farmers' responses.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents results and discussion of the study. The findings are presented into four sub-sections. Section 4.2 explains the socioeconomic characteristics of the surveyed coffee farmers. Section 4.3 presents the Institutional analysis for the specialty coffee in the study area. Section 4.4 describes the aspects of transaction costs for surveyed coffee farmers. Section 4.5 presents factors that influencing the level of coffee yield, 4.6 and 4.7 discusses factors that influence coffee farmers' decision to participate into specialty coffee market and proportional of specialty coffee in the market respectively.

4.2 Socio-economic characteristics of coffee farmers

Socioeconomic characteristics have a potential effect on the decision on how to allocate scarce resources within the community. They also reflect the potential to produce and the capacity to adopt new technology or changes in farming practices. Table 7 presents descriptive statistics of social economic characteristics of the surveyed coffee growers.

Ages of the respondents ranged from 21 to 90 years old with mean of 60. About 44 % of the respondents (18 – 59 years old) and 56% (60 years old and above) participated fully in the specialty coffee. Conventional and specialty category comprised of farmers aged between 18 and 59 (45%) and above 60 (55%). It is clear that, those farmers of the ages above 60 years old participated more in specialty and organic coffee and energetic farmers between 18 and 59 years old participated in conventional coffee market.

Table 7: Social Economic characteristics of the coffee farmers

	N	Min	Max	Mean	Std. Deviation
Age of household head (Yrs)	250	21	90	60	13.28
Education of household head (years)	250	0	20	6.79	3.33
Female headed household (0/1)	250	1	2	1.15	0.36
Size of coffee plot (acre)	250	0.13	8.00	1.71	1.30
Tree count	250	50	3 700	536.60	451.44
Trees per acreage	250	16	1 500	343.71	165.56
Age of coffee producing tree (years)	250	6	110	36	10.8
Premium price (Tsh)	250	0	1 451	288.86	409.63
Input 2007 (Tsh/acre)	250	0	500 000	61 027.49	64 707.39
Time spent to reach market (hrs)	250	0.03	3	0.54	0.76
Experience in specialty coffee (years)	57	1	8	13.61	14.57
Experience in conventional coffee (years)	176	2	80	30.52	17.30
Experience in organic coffee (years)	17	3	8	5.50	1.82
Frequency of selling	250	1	28	6.79	4.93
Delivery 2007 (Tsh/Kg)	250	0	357	14.19	37.64
Investment (Tsh/acre)	250	2 500	372 000	69 377.45	64 010.94
Percentage of red-rip cherries	250	50	100	91.68	13.85
Total output (Kg)	**250**	**20.20**	**12 800**	**620.19**	**1 018.28**

Education is a crucial factor on the choice of what to produce as well as market to sell their produce. It increases the capacity to use good agricultural practices and searching for information on marketing. The selected sample was dominated by farmers with primary school education 73.6%. Farmers who were educated above the level of primary school and non education were 20.8% and 5.6% respectively. The specialty coffee category leads by having larger percent with primary education followed by conventional, conventional and specialty; and lastly organic (78%, 77%, 71% and 59% respectively).

Farmers in the study area owned small plots of coffee and bananas around their homestead ranging from 0.13 and 8.00 acres and mean of 1.71. About 53% out of 57 Specialty coffee farmers owned between one and three acres of coffee plots and conventional farmers 52% out of 83 own between 0 and 1 acre of coffee plot. Conventional and specialty coffee farmers (52% out of 93) owned more than three acres while organic coffee farmers (59% out of 17) owned between 1 and 3 acres of organic coffee plot.

Premium price to coffee farmers was found to be important on the decision to choose weather to participate in the specialty coffee market or not. Premium price varied widely across the sample with many farmers getting zero to Tsh. 1451 the highest and a mean of 288.86.

Concerning experience, all respondents had grown coffee throughout their adult lives and are aware of recommended coffee practices. The idea of Specialty and organic coffee was introduced about eight years ago. The idea of specialty seems to be well known because only 5% of the entire sample claim to know nothing about specialty coffee, 6% too expensive to produce and 9% can earn more income without specialty. The remaining in

the sample is either participating fully or partially or they are willing but need to be sensitized.

Delivery costs were found to vary across coffee farmers ranging from zero cost to Tsh 357 per delivery. This variation is due to farmers' location, yield level and labour availability. Farmers from higher altitude areas have more frequency of picking because of temperature variations compared to those residing in lower altitude areas. Other reasons were found to be need for immediate cash to pay labours in picking season and need for cash to buy consumer goods. About 94% of the respondents were found to depend solely in agriculture as their main source of income with coffee being the only cash crop.

Investments include all recommended practices in the coffee plot such as weeding, pruning, spraying, picking, fertilizer/manure, pulping, washing and drying. Costs of these practices were taken as one of the determinant of yield and quality of coffee. The investment costs were found to range between TSh. 2500 and 372 000. This variation across the sampled farmers was due to tree count per acre, household labour and economic status of the household.

Picking and other post harvests process are main determinants of the quality of the coffee. It is recommended that cherries should be picked when they are 100% red-ripe to enhance smooth pulping, fermentation, washing and drying. Respondents were asked to what extent the picked cherries were red ripe (in percentage). The ripening stage for the picked cherries was found to vary between 50% and 100%. About 63.2% out of 57 specialty coffee farmers picked 100% red ripe cherries. Conventional farmers (47% out of 83) picked 100% red ripe cherries. Those who participated both in specialty and conventional;

71% out of 93 picked at right stage (100% red-ripe cherries) while 76% out of 17 organic farmers were picking 100% of red-ripe cherries.

4.3 Description and analysis of institutional arrangement

Institutional analysis was carried out to describe the institutional arrangement of specialty coffee in the study area to fulfil objective number one. This sub section explains their occurrence in terms of transaction cost arguments and distinguishes from other existing institutional arrangements in coffee industry.

4.3.1 Institutional background

In the study area, coffee farmers who participated in specialty coffee market were organized into groups known as Farmer Business Groups (FBGs). These groups were established by the help of an NGO known as Technoserve. Technoserve is a US organization with head office in Washington DC and other geographical offices in Arusha and Dar es Salaam, Tanzania. This organization is aiming at creating income, employment and opportunity by improving the industrial competitiveness for rural people.

Farmers have been helped to overcome problems in the coffee industry through value addition in their products by use of simple interventions (Kimaryo, P. Personal communication, 2008). Also industrial stakeholders were helped to develop and implement a plan to transform Tanzania into one of the world's premium specialty targeting the entire supply chain. Technoserve created a unique FBGs model that helps small scale growers improve quality, obtain financial credits, establish contracts with overseas buyers and ultimately increase their profits. The FBGs were mobilized into farmer owned trade association known as Kilimanjaro Specialty Coffee Growers

(KILICAFE). KILICAFE is also a member of East Africa Fair Coffee Association (EAFCA) which is aiming at promoting small scale coffee production by improving quality, production and market linkage.

4.3.2 Operations of KILICAFE

At present KILICAFE is a net work for the existing FBGs in specialty coffee industry within Tanzania. KILICAFE in collaboration with Technoserve provides services such as technical assistance in coffee production, post harvest handling, group formation, business planning, credit acquisition, Marketing and business management to the members. KILICAFE is also responsible in signing the contract with the buyers, receiving and working on orders from the buyers and all other arrangement for the direct export of specialty coffee from Tanzania.

KILICAFE is using Warehouse Receipt System which conforms to sustainable standards of the international market. Payment to specialty coffee farmers is done into two instalments. The first payments are done right after the grading and classification while the final payments are done after completing all the selling arrangements and deduction of the running costs.

KILICAFE enters the value chain directly when FBGs delivers parchment coffee to TCCCO and other curing factories and accomplish the exchange. This association do charge for the marketing services. Normally three percent value of the direct exported coffee is charged by KILICAFE while the two percent is charged for the coffee sold through auctions. These charges help to run day to day activities of the association.

Up to April 2009, about 139 of FBGs were already established (102 in the southern and 37 in the Northern zones). Technoserve has facilitated also the installation of 11 CPUs to FBGs in the Northern zone. The surveyed area has four categories of coffee growers; specialty, conventional and specialty, conventional and organic (fig. 4).

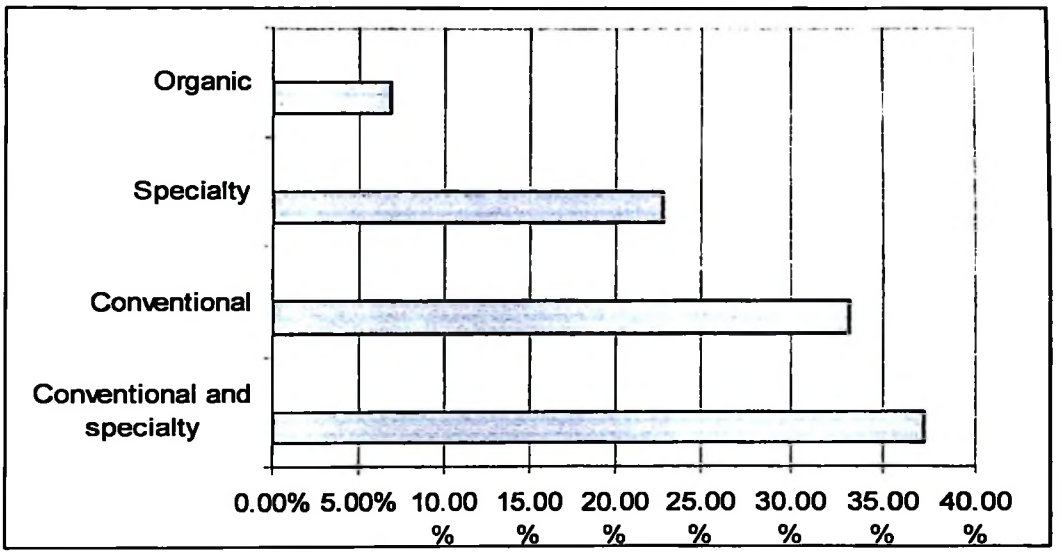

Figure 4: Categories of coffee farmers

This study shows that majority of coffee growers sold both conventional and specialty (37%) followed by conventional (33%), 23% specialty and 7% organic farmers.

4.3.3 Operations of FBGs

FBGs in the study area (Table 8), owned CPUs or factory in which the wet processing for cherries was conducted. FBGs employed few people to supervise the daily operations in CPUs. The employee includes the factory manager, quality controller, cashier, guide and all other works are done by members or daily labourers especially in peak season. Farmers are required to pick the red-ripe cherries and deliver them to the CPUs within eight hours after picking. The delivered cherries are inspected by the factory quality

controller, weighed and taken into CPU ready for pulping. Any default on the cherries, the farmer is responsible either by resorting or return them home for own processing using HP. It is approximated that five kilograms of cherries is equivalent to one kilogram of parchment coffee.

Table 8: FBGs in the study area

Name of FBG	Village name	District	Total members
Mrimbo-Uwo Best Coffee Growers	Mrimbo-Uwo	Moshi Rural	102
Amkeni Gourmet Coffee Growers	Lole Marera	Moshi Rural	116
WABOKASHA Group	Shari	Hai	40
Roo Gourmet Growers	Roo	Hai	60
Isawerwa Specialty Coffee Group	Mudio	Hai	36
Total			**354**

Cherries are pulped (removing the outer part of the coffee cherry) then thoroughly washed to remove the mucilage or slimy coat and fermented in the cement tanks or plastic drums for 24 hours. After the first 24 hours, the coffee beans are then rewashed and socked for another 24 hours rewashed and water dried on sun followed by shade dry for the remaining period until the parchment moisture reaches 13% or less.

FBGs with CPUs can deliver both Specialty for direct export and conventional to sell through auction from members and non members. FBGs without CPUs collect conventional coffee from members and non members. Parchments are packed into bags of 50 kg ready to be transported to Tanganyika Coffee Curing Company Ltd (TCCCO) for curing and grading.

4.3.4 Farmers' obligations

All FBGs in the study area had constitutions which explain the structure of the board, member's rights and obligations among others. For example; a member in Mrimbo-Uwo Best Coffee Growers is obliged to meet the following criteria (as it is stipulated in their constitution); be a smallholder farmer in Tanzania, growing coffee and banana, cooperate in group works, aged eighteen and above years old, pay entry fees and shares, attend meetings, keeping livestock and deliver all ripe cherries to the CPU. Farmers who are not members of the group should adhere to the quality criteria and in case of any deductions of the sold coffee they will also be deducted the same as members. These deductions enable the FBGs to pay back different loans for example the installed CPUs, house rents or house loans, allowances for the employees as well as other daily operations for the group. Also FBGs have received a financial support from Participatory Agriculture Development Program (PADEP) to support their projects. An example of FBGs in the study area which received the government support includes Mrimbo-Uwo, Roo Gourmet Growers, WABOKASHI, and Amkeni Gourmet Coffee.

4.3.5 Marketing process and channel outlet

FBGs (Table 9) and KILICAFE were the only institutional arrangements dealing mainly with specialty coffee and some time conventional coffee in the study area. Cooperatives dealt with conventional and organic coffee despite the fact that few of them also own the CPUs with bigger capacities. Private buyers were found to buy only conventional coffee. Two CPUs were owned by three cooperatives in Hai district (Roo, Mudio and Masama Mula cooperatives). Roo and Mudio primary cooperatives own one factory together. These cooperatives installed the CPUs since 1960s but because of poor management and lack of spare parts for the repair, the two CPUs were found to operate under capacity. At the

moment, only FBGs have been able to improve the quality of coffee using their CPUs and pay higher prices to their farmers. The chi-square test is statistically significant at 1% level showing variations in institutional arrangements.

Table 9: Institutional arrangements

Type of coffee	Type of Institutional arrangement			
	Private Trades	Cooperatives	FBGs	Cooperatives and FBGs
	%	%	%	%
Specialty	0	0	100	0
Conventional	2.4	89.2	7.2	1.2
Conventional and specialty	1.1	28	58.1	12.9
Organic	0	100	0	0
Total n	**4**	**121**	**112**	**13**

$X^2 = 168.489$, df = 9

4.3.6 Reasons for preference of institutional arrangement

Farmers were asked the reasons behind the choice of institutional arrangement in which they were selling their coffee and their response were as follows; 43% who sold through FBGs were motivated by higher price while 45% selling through cooperatives were motivated by payment assurance (Table 10). Farmers selling both in FBGs and Cooperatives claimed to have no option for their choice (50%). Again farmers selling organic coffee through cooperatives were motivated by higher price and payment assurance. Looking at these findings, FBGs were seen as institutional arrangement in which higher prices could be obtained by selling specialty coffee, although some

respondents pointed out the issue of management cost (inputs and other agronomical practices) which is necessary for improving the quality of coffee. The possibility of payment assurance was seen in cooperatives by selling conventional and organic coffee. The chi-square test was statistically significant at 1% level showing that, the reasons for market preference varied across coffee farmers in the study area.

Table 10: Reasons for market selection

Type of coffee	Reasons for market preference		
	Paid higher price	Payment assurance	No option
	%	%	%
Specialty	43.0	12.1	16.7
Conventional	10.5	45.9	33.3
Conventional and specialty	38.4	35.7	50.0
Organic	8.1	6.4	0
Total n	**86**	**158**	**6**

$X^2 = 50.346$, df = 9

Farmers selling both specialty and conventional coffee generally gave four reasons for their decision; first they claimed to protect membership in FBGs and primary cooperatives; second, need of immediate cash for farm operations whenever there is a payment delay especially in Shari village. The third reason was the fact that FBGs closes their factories earlier than other buyers or collectors therefore farmers who are still picking (especially in high altitude areas) have to process their cherries at home and sell as conventional mostly to primary cooperatives. The fourth reason was the quality of coffee. Some times diseases and pests lower the quality of cherries in the farm to the extent that it

can not meet the quality standards of specialty coffee; in this case farmer has to opt for other institutional arrangement different from FBGs.

This study found certification system on place to ensure the standards of specialty coffee market are well adhered along the value chain. Fair Labelling Organization (FLO) was mentioned during the survey as a certification board in the study area. Inspection is also conducted to CPUs and farmers based on cleanness of the working environment, waste disposal and water sources.

Specialty coffee produced in the study area was reported to fall mainly in class four to six, (Sala, A.N. personal communication, 2008). The volume of specialty coffee was reported to increase from 420 tons to 2460 tons between seasons 2002/03 to 2008/09. Buyers of Tanzanian specialty coffee were mainly Peet's Coffee & Tea, Starbucks Coffee Company, and Dallis Coffee (based in the U.S.), Gepa, List & Beisler (based in Germany), Illy cafee from Italy and Volcafé Ltd from Japan (Fig. 5).

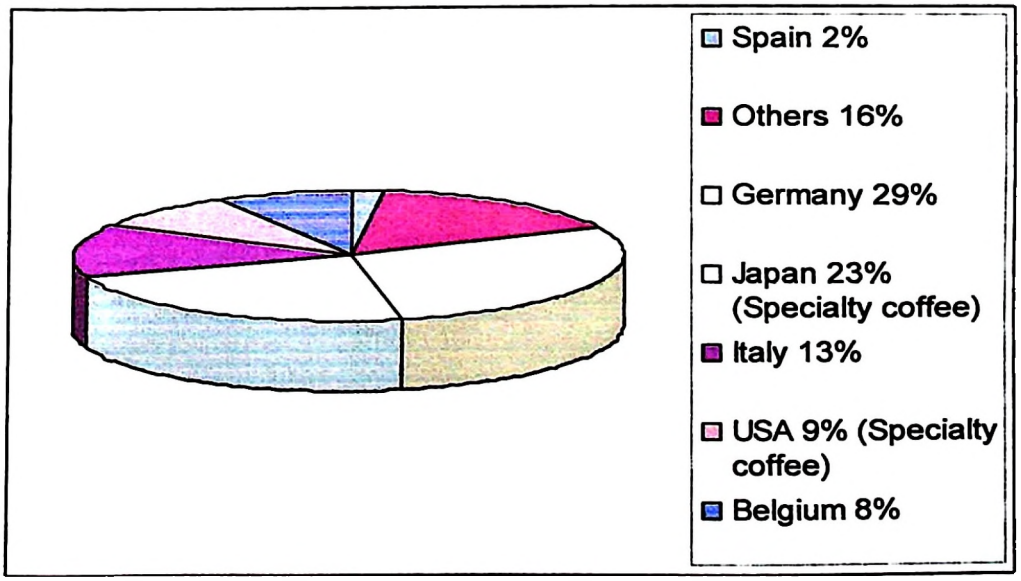

Figure 5: Coffee exports from Tanzania for 2007/08 season, *Source* TCB.

4.4 Aspects of marketing transaction costs for coffee farmers

The following factors were identified as sources of transaction cost in the study area;

(i)Frequency of selling

Frequency of sells (number of deliveries within a season) was taken as one of the sources of transaction costs in the present study. The more the frequencies that farmer made in delivering the product, the more the transaction costs that he or she will face. Table 11 shows that, in three cases farmers were found having more than three frequency of selling coffee in a single season. About 88% specialty coffee farmers were making more than three frequency of selling; 84% of coffee farmers selling both conventional and specialty made more than three frequency of selling per season while for organic farmers 71% had more than three delivery frequencies per season.

Table 11: Influence of frequency of selling on the choice of market

Type of coffee	Frequency of delivery coffees		Total n
	≤ 3 %	≥ 3 %	
Specialty	12.3	87.7	57
Conventional	57.8	42.2	83
Conventional and Specialty	16.1	83.9	93
Organic	29.4	70.6	17
Total n	**75**	**175**	**250**

$X^2 = 47.18$, DF =3

The same survey found 58% of conventional coffee farmers had less or equal to three frequency of selling per season. The Chi-square shows that the frequency of selling between the four categories of coffee farmers differs significantly at 1%.

(ii) Remoteness and mode of transport

Remoteness was taken as distance from homestead to market place. Remoteness is one of the variables contributing to the level of transaction cost and has an influence on the choice of market channel (Boger, 2001). In this study the information on remoteness and mode of transport were measured by asking farmers how much time they spent on their way to the selling centres and what means of transport they were using in transporting coffee. It was found that, about 42.4% of farmers used wheelbarrows, 14% bicycles, 5.2% pickups while 38.4% used to walk. Under stiff competition coffee buyers or collectors, (eg Masama Mula rural cooperative) was found to arrange a cost sharing transport with farmers who have coffee farms far from the CPU to make sure that they win others.

The findings from this study (Table 12) revealed that 96.5% of specialty and 94.7% of conventional and specialty coffee farmers spend one hour or less to reach collection or selling centres. The remaining farmers who produce either conventional or organic coffee spent less than one hour to reach collection centres.

Table 12: Time taken by farmers to reach market

Time spent to reach market	Specialty	Conventional	Conventional and Specialty	Organic
	%	%	%	%
≤ 1hr	96.5	100	94.7	100
> 1hr	3.5	0	5.4	0
Total n	**57**	**83**	**93**	**17**

The chi-square test showed that, time spent to reach the collecting centres differs significantly between the four categories of coffee farmers at 5% ($X^2 = 22.7$, df =12) significant level.

(iii)Trustworthy

Trust reflects the aspect of uncertainty in the business. About 98% of specialty coffee farmers declared totally to have trust in the FBGs. On the other hand 100% of organic and 98% of conventional coffee farmers declared to trust cooperatives as their collector while 95% of farmers selling conventional and specialty trust both FBGs and cooperatives as their collectors. The percentages are high enough to believe that there is enough between the parties. The chi – square test shows that there is no significant different between the four categories of coffee farmers in terms of trustworthiness of their trading partners.

(iv) Asset specificity

From asset fixity principle, an asset becomes more specific to a particular use or user as the cost of transferring to alternative use increases (Mbise, 2007). Also the higher the level of asset specificity the higher the probability that, more vertically integrated mode of governance will be preferred for transaction (Williamson, 1993). During the survey farmers were asked if they can use the land planted with coffee to other production activities. The findings revealed that about 29 out of 57 (51%) specialty coffee farmers can locate land for other production activities. On the other hand about 42 out of 82 (51%) conventional, 6 out of 17 (35%) and 39 out of 93 (42%) can locate land to other alternative productions. Other alternative productions to land were mainly bananas and vegetable cultivation. Although larger percentage of speciality and conventional farmers find it more difficult to allocate land to other uses, the chi-square tests does not show significant different between the four categories of coffee farmers.

(v) Accessibility of price information

Accessibility on price information was collected by asking farmers if they were informed about prices before they take their coffee to the collecting centres. About 81% of specialty coffee farmers receive price information prior coffee delivery (table 13). This is also applied to 93% of conventional and 89% of conventional and specialty. On the other hand 100% of organic coffee farmers can access price information before they deliver their coffee. These findings show that cooperative members receive more information on price compared to members of FBGs. In the study area Cooperatives were perceived as public institutions as they have existed since the introduction of coffee and could easily use several aggregations within the village such as village meetings (which most of the time are held within cooperatives' compound), religious institutions to advertise the buying price and other related information to reach many people at once. FBGs were perceived as private institutions aiming at abandoning the cooperatives. Specialty coffee farmers were getting price information mostly from collecting centres, groups' meetings, friends and neighbours and in this way could not reach many people at once. From the cross tabulation results it revealed that the accessibility to price information between the four categories of coffee farmers differs significantly at 5% level.

Table 13: Price information accessibility

Type of coffee grown	Number of farmers receiving or not receiving Price information	
	Receive price information	Not receiving price information
	%	%
Specialty	80.7	19.3
Conventional	92.8	7.2
Conventional and Specialty	89.2	10.8
Organic	100	0
Total n	**223**	**27**

$X^2 = 8.67$, df =3

(vi)Technical assistance

Table 14 shows that about 94% of organic coffee farmers received technical assistance frequently compared to others. Farmers who sold through FBGs (61% of specialty and 60% of specialty and conventional) received technical assistance from their collectors. Only 45% of conventional coffee farmers receive technical assistance. These results indicated that institutional arrangement for specialty coffee provides more opportunities to farmers in accessing the technical assistance than others. Type of technical assistance received by coffee farmers were trainings on coffee agronomic practices, inputs such as pesticides, fermentation drums, CPUs and drying mesh. Technoserve in collaboration with KILICAFE have been working closely to ensure that farmers receive technical assistance so as to fulfil the intended objective. The chi-square tests showed that the accessibility of technical assistance differs significantly between the four categories of farmer at 1% level.

Table 14: Number of farmers receiving technical assistance

Type of coffee grown	Number of farmers received technical assistance	
	Receiving Technical assistance	Not receiving Technical assistance
	%	%
Specialty	61.4	38.6
Conventional	44.6	55.4
conventional and specialty	60.2	39.8
Organic	94.1	5.9
Total n	**144.0**	**106**

$X^2 = 18.04$, df = 3

(vii) Contract

During the survey, farmers were asked whether they had any kind of contract with their buyer or not. Well enforced contract will reduce uncertainty and hence low transaction costs. The institutional arrangement that producers and buyers will opt has an impact on transaction costs Comparing the categories of farmers it can be said that large percentage of coffee farmers had informal agreement. The conducted survey found that, small percentage of specialty, conventional, conventional and specialty and organic coffee (9%, 4%, 3% and 29% respectively) have written contract with their collectors (Table 15). Generally this result indicates the higher degree of transaction costs and risks in the business, as most farmers had no written contract with their FOs. Despite the fact that only FOs had written contract with their buyer, over 90% trustworthiness must have reduced transaction cost that is due to risks in doing business. Chi-square tests showed significant difference on contractual arrangement between the four categories of coffee farmers at 1% significant level.

Table 15: Number of farmers who are under contract with their buyers

Type of coffee grown	Type of contract		
	Written contract	Informal agreement	No any kind of contract
	%	%	%
Specialty	8.8	66.7	24.6
Conventional	3.6	78.3	18.1
conventional and specialty	3.2	84.9	11.8
Organic	29.4	70.6	0
Total n	16	194	40

$X^2 = 21.54$, df = 6

(viii) Follow-up costs

The period between delivery of product and payment receipt has an effect on the level of transaction cost for producer especially when is not specified between the transacting parties. This information was captured by asking farmers how long it takes to receive their payments for the delivered lot. The cross tabulation results (Table 16) shows that 93% specialty, 95% conventional, 86% conventional and specialty and all organic coffee farmers received their payments at delivery time. On the other hand only 8% of surveyed farmers had to wait between 3 to 14 days to receive their payments. Specialty coffee farmers from Shari village (WABOKASHI) reported to wait for 14 days before they get their payments. At times these farmers may have cash flow problems and may not be ready to wait for 14 days so may opt to sell to different buyers for immediate cash needs.

Table 16: Relationship between type of coffee grown and enforcement cost of exchange

Type of coffee grown	Time taken by the buyer to pay producer		
	At delivery	Has to wait	Total %
	%	%	
Specialty	93.0	7.0	100
Conventional	95.2	4.8	100
Conventional and Specialty	86.0	14.0	100
Organic	100.0	0	100
Total n	**229**	**21**	**250**

X^2 7.934, df = 3

The chi-square tests shows that follow up costs differs significantly between the four categories of farmers at 5% significant level, indicating that farmers selling solely through cooperatives receives early payments; followed by those who selling solely through FBGs and lastly the mixture of the two.

4.5 Factors influencing the level of coffee yield

Factors influencing the level of yield to specialty, conventional and specialty, conventional and organic coffee farmers were analyzed by using ordinary least square linear regression model. Four models were estimated for the four categories of farmers. The models predicted the relationship between dependent variable and independent variables. After several running of the analysis some variables such as price information, education, age and experience were dropped after detection of multicollinearity problem. The results of regression analysis are presented in Table 17.

Estimated coefficients have expected signs and adjusted R^2 for the four models showing power of explanatory variables in the models which are 95.4%, 90.9%, 89.9% and 93.6% for specialty, conventional and specialty, conventional and organic coffee farmers respectively.

The results showed that, both agronomic and institutional variables were found to be important in influencing the yield of coffee. The variables that were found statistically significance in influencing the yield of coffee are investment costs, labour, income, farmers' training, delivery cost and tree density.

Investment cost: Investment cost has expected sign but only statistically significant at 5% level for specialty coffee farmers. For specialty coffee farmers the response in yield level towards investment cost is almost five times over other farmer categories. This response is due to replanting of new seedlings and use of better farming practices.

Table 17: Regression analysis of factors influencing the yield of coffee

Independent Variables	Specialty	Conventional and Specialty	Conventional	Organic
(Constant)	-3.133***	-2.767***	-2.871***	-3.125***
	(-13.847)	(-6.439)	(-7.618)	(-15.861)
Income	0.99***	.968***	.964***	.991***
	(49.64)	(33.621)	(35.67)	(41.63)
Tree density per acre	.735***	.693***	.697***	.611***
	(3.322)	(4.921)	(5.177)	(4.677)
Investment cost	0.048**	0.039	0.036	0.025
	(2.307)	(1.407)	(1.354)	(1.121)
Delivery cost 2007	-0.028*	-0.034*	-0.030	-0.027*
	(-1.92)	(-1.832)	(-1.626)	(-1.777)
Labour	0.050*	0.135**	0.125***	0.063**
	(2.024)	(2.867)	(2.962)	(2.366)
Farmer training	0.027*	0.031	0.033*	0.023
	(1.806)	(1.601)	(1.842)	(1.478)
Tree age	-0.130**	-0.065	-0.072	-0.065
	(-2.381)	(-1.379)	(-1.381)	(-1.379)
	R^2=0.954	R^2 = 0.909	R^2 = .899	R^2 = 0.936
	N= 57	N = 93	N = 83	N = 17

Dependent Variable: Coffee Yield.

Note: Single, double and triple asterisks denote significance at 10%. 5% and 1% respectively. Values in parentheses are t-values.

Income: Average income was found significant at 1% level and larger determinant of yield increase to coffee across all farmer categories. These findings suggests that farmers who get higher returns from coffee are more likely to increase production following reforms in coffee marketing than those who get less. The findings from this study depict

that an increase in returns from coffee will lead to yield response to all categories of farmers, as they be able to buy inputs and expand their production.

Tree density: As it was expected, this variable has positive relationship with response in coffee yield and was statistically significant at 1% level for all categories of farmer. The positive and significant relation between the variables indicates that farmers will increase their coffee yield if they increase the number of coffee trees per unit area. Also this coefficient confirms that a unit increase tree density, the yield will respond positively by more than 60% across all categories of farmer.

Delivery cost: The variable has expected sign and significant at 10% level for the three categories of farmers (specialty, organic and conventional and specialty). The coefficients associated with delivery costs shows that, increase in delivery cost of TSh. 1 will reduce yield response by 10Kg/acre. This result implies that if delivery cost will be higher to specialty, organic and conventional and specialty coffee farmers then they won't be able to increase yield.

Labour: The coefficient associated with labour is positive as expected and significant across all categories of coffee farmers at 1%, 5% and 10%. These findings depict that the response of coffee yield for conventional; conventional and specialty coffee farmers towards labour is twice that of specialty and organic coffee farmers. It can be said that, household with members aged between 18 and 60 years old are more likely to increase coffee yield provided the market will offer attractive prices.

Farmer training: The coefficient associated with farmer training is positive but only significant for specialty and conventional coffee farmers at 10% level. These results

indicate that an additional training to coffee farmers will result in the yield response by the corresponding variable coefficient of almost three percent. This result implies that, coffee farmers who have received trainings to improve production and quality have the potential to increase coffee yield as well.

Tree age: When coffee trees get too old they no longer yield not only quantity but also quality coffee and do not bring in much income. The coefficient associated with tree age is negative as was expected and statistically significant at 5% level for specialty coffee category. This coefficient implies that an additional year to a matured coffee tree will lead to the yield reduction by 13%.

4.6 Factors influencing farmers participation in specialty coffee market

Probit analysis was employed to determine qualitatively how the relevant factors interact to influence the decision of individual coffee farmer to participate in specialty coffee market. Dependent variables were taken as (Dummy, 1= if farmer is full participating in specialty coffee marketing, 0 = otherwise). The independent variables were Premium price, Price information, Age, Years of schooling, remoteness, Frequency of selling coffee, Payment period, Percentage of red-rip cherries, Contract and Membership in group. After several running of the model, independent variable such as coffee yield and labour were dropped due to limited variability among farmers that was making the model unstable. The results showed that the estimated model was significant at 1% level. The final results of parameters are summarized in Table 18.

Out of 13 explanatory variables, seven variables were found to determine the probability of specialty coffee market participation. These are farmer training, investment cost, competitive buyers, premium price and membership in FBGs. In addition to these,

transaction costs plays a big role in determining the farmers' decision to participate in specialty coffee market.

Premium price: This variable has positive effect on decision to participate in speciality coffee market and statistically significant at 10% probability level. The positive and significant coefficient for this variable confirm that for every TSh. 1 increase in premium price there is probability of increasing participation in specialty coffee market by 10%. This results shows that premium price will influence farmers decision to participate in specialty coffee market.

Investment cost: The coefficient for investment cost is negative and significant at 10% level. The estimated model indicates that the increase in investment cost (either for institutional development or expanding production) will decrease farmers' decision to participate in specialty coffee market. The marginal effect confirm that an increase of TSh. 1 in investment cost, will half the probability of farmers to participate in specialty coffee market.

Technical assistance: The estimated coefficient for variable technical assistance is positive and significant at 5% level. This results implies that, increasing trainings on good farming practices and inputs such as pesticides and fertilizer will increase the possibility of farmers to participate in specialty coffee market by 3%. Technical assistance plays a big role in improving the quality and quantity of specialty coffee.

Table 18: Factors influencing farmers' decision to Participate in specialty coffee market

Independent Variable	Coefficient	T-ratio	$\partial y/\partial x$
Age	.0531687	0.26	.0140753
Years of schooling	.1269713	0.73	.0336129
Remoteness	-.3055687*	-1.76	-.0808926
Price information	.0140966	0.05	.0037318
Frequency of selling	.062084**	2.31	.0164354
Trust	.0818179	0.15	.0216595
Technical assistance	.1480817**	2.02	.0392014
Investment cost	-2.1106*	-1.670	-5.5807
Payment period	-.4482838	-1.16	-.098657
Competitive buyer	-.9207835 ***	-2.80	-.2437574
Tree density per acre	0.006734	0.26	.0066067
Premium price	.0249567*	1.76	.1049043
Membership in group	.6687754 ***	2.67	.1770437
Constant	.1695018	0.14	
Wald Ch^2	47.78		
R^2 (Pseudo R^2)	0.2276		
N	250		

Dependent variable (Dummy): Household participation in specialty coffee market

Note: *, ** and *** = Significant at 10%, 5% and 1% respectively.

Remoteness: This variable has negative effect on probability of increasing participation in specialty coffee market and found to be statistically significant at less than 10% level. The negative relationship indicated that the further the household is from the CPU, the more difficult and costly it would be to get involved in the specialty coffee market. The marginal effect also confirms that an increase in one-hour traveling distance from farmer's homestead to the CPU reduces the probability of participation in specialty coffee market by 8%.

Membership in group: As it was expected, this variable has positive relationship with specialty coffee market participation decision and was statistically significant at 1% probability level. The positive and significant relationship between the variables indicates that having membership in FBGs will increase the willingness to participate in the specialty coffee market. Marginal effect of the variable also confirms that every increase in membership within group leads to the probability of participation in specialty coffee market by 17%. This results suggested that, performance of FBG is an important aspect in stimulating small scale farmers to participate in specialty coffee market.

Competitive buyers: The results from this study shows that, the presence of competitive buyers in the study area reduces the probability of individual farmer's decision to participate in specialty coffee market. The coefficient for variable competitive buyer is negative and significant at 1% level. Also the marginal effect confirm that an increase of single competitive buyer will reduce the probability of individual farmer's decision to participate in specialty coffee market by 24%.

Frequency of selling: The coefficient associated with frequency of selling is positive and significant at 5% level. This indicates that the probability of deciding to participate in specialty coffee market is higher for farmers who sell coffee more frequently to obtain cash for daily expenditures than those who sell less frequently. The calculated marginal effect showed that for every single delivery of coffee, the probability of participating in specialty coffee market is also increased by two percent.

In summary, the variables which showed the expected sign but insignificant were years of schooling, price information, trust, payment period and tree density. These variables were included in the model due their importance in stabilizing the estimated model.

4.7 Factors affecting the proportion of specialty coffee in the market

Multiple linear regressions were used to analyze factors that affect the proportion of specialty coffee in the market using OLS technique. In this case proportion of specialty coffee was taken as the ratio of specialty coffee to the total yield of coffee produced by individual farmer. The specified model includes only farmers with specialty element. The analysis was undertaken in stepwise by adding individual independent variable in the equation and observing the value of R^2. From Table 19, the independent variables explain about 55.2% of variation in proportion of specialty coffee.

The model results indicated that the predicted variables were almost all important in influencing the degree of participation in specialty coffee market. The variables that are statistically significant includes premium price, age of the household head, years of schooling, frequency of selling, payment period, percentage of red-rip cherries and membership in group.

Table 19: Estimated coefficients of factors affecting the proportion of specialty coffee in the market using regression model

	Unstandardized coefficients			
	B	**Std. Error**	**t**	**Sig.**
(Constant)	-.394	.280	-1.406	.162
Premium price	.001	.000	1.681	.095*
Price information	.083	.064	1.302	.196
Age	.006	.002	3.063	.003***
Years of schooling	.023	.008	3.020	.003***
Remoteness	-.003	.002	-1.649	.094*
Frequency of selling coffee	.009	.004	2.042	.043**
Payment period	-.210	.072	-2.918	.004***
Percentage of red-rip cherries	.008	.002	3.687	.000***
Contract	.045	.044	1.024	.308
Membership in group	.133	.056	2.364	.020**
R^2	.552			
N	150			

Dependent Variable: Proportion of specialty coffee.

Note: Single, double and triple asterisks denote significant at 10%, 5% and 1%.

Payment period: Payment period is negative and significant at 1% level. It is also a larger determinant of degree of farmers' participation in speciality coffee market. This coefficient indicates that a delay in payment arrangement for one day will reduce the share of specialty coffee by 21%. These results suggested that, payment arrangement is very important in motivating farmers to increase the proportional of speciality coffee in the market.

Membership in group: As expected membership in FBG (dummy), has positive coefficient and statistically significant at 5% level. This coefficient indicates that the presence functional institutional arrangement in place will give positive response on the degree of farmers' participation in the speciality coffee market by 13%. Registered members are more likely to increase their share of specialty coffee than non registered members.

Premium price: The coefficient associated with premium price is positive and statistically significant at 10% level. This indicates that an increase in premium price of TSh. 1 per Kg of specialty coffee will motivate farmers to increase the proportion of specialty coffee by 0.1%. This result predicts the increase in proportional of specialty coffee in the market as TCB has already enacted a new regulation which allows producers with high quality coffee to sell directly to overseas buyers. Further more, the reduction of berries in issuing the licence for coffee buyers will motivate both buyers and producers to increase the share of specialty coffee.

Age of the household head: The model results depicted that age of the household head had positive coefficient which is different from expectations. The positive and significant relationship between the two variables indicates that older household heads could have larger proportion of specialty coffee in the market, simply because for specialty coffee all the post harvests process which are more labor intensive are done in the CPUs centrally to other types of coffee. This coefficient confirms that when the age of household head increases by one year, the proportion of specialty coffee will increase in the market by 0.6%.

Years of schooling: The findings from this study showed that years of schooling (taken as level of education), was also an important parameter for the functioning of institutional arrangement in specialty coffee. The coefficient was positive and statistically significant at 1%. The results showed that educated farmers are more likely to increase proportional of specialty coffee in the market than less educated farmers. For one year increase in schooling year to the household head, the proportion of speciality coffee will increase by 2.3%. This result supports other findings from Kilima *et al.* (1999) that educated farmers prefer to sell their coffee in other institutional arrangement different from cooperatives.

Remoteness: Remoteness was taken as time spent to reach to the collecting or selling centres. Remoteness is also an element of transaction cost to a producer. The coefficient indicate, that more time spent to reach market will discourage farmers to increase the proportional of specialty coffee as it requires same day picking and frequent deliveries than other types of coffee. The negative and significant coefficient on remoteness indicates that travel costs to the market will diminish the degree of farmers' participation in speciality coffee market by 0.03%.

Frequency of selling coffee: Frequency of selling is another important factor in increasing the share of specialty from an individual farmer. The coefficient associated with the variable is positive as expected and statistically significant at 5% level. The same coefficient indicated that an increase in one delivery coffee trip could increase the proportion of specialty coffee by 0.9%. This result suggests that farmers who need immediate cash for their daily expenditures can easily get through selling cherries to CPUs than selling parchment coffee which can be bought by other buyers different from FBGs.

Percentage of red-rip cherries: The ripening of coffee cherries is one of the important aspects in improving the quality of parchment coffee and proper functioning of institutional arrangement in specialty coffee industry. The result suggests that the proportion of specialty coffee for farmer will increases with the increase in the percentage of red-rip cherries in the picked lot. The coefficient for red-ripe cherries is positive as expected and statistically significant at 1% level. It is also indicating that an increase in one percent of red-ripe cherries will increase the proportion of specialty coffee by 0.8%, meaning that agronomic skills to coffee farmers will contribute to large extent the degree of farmers participation in specialty coffee market.

In summary variables which showed expected sign but insignificant were price information and contract. These results indicated that the two variables were not important in determining the degree of farmers' participation in specialty coffee market in the study area.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Generally this study has examined the institutional arrangement in specialty coffee in Tanzania in terms of transaction costs and to what extent the differences can be explained by characteristics of the product, supply chain, quality requirements and farmers. This study was conducted to increase the understanding of what institutions are necessary for the successful specialty coffee industry.

Data were collected through structured questionnaires from a sample of 250 respondents from nine villages in Hai and Moshi Rural district using purposive, stratified and random sampling techniques. The collected data were analysed through descriptive and econometric methods.

The main results from this study (based on objective one, two, three and four) found that, in the study area two institutional arrangements for specialty coffee market was established to accomplish exchange activity; these include FBGs and KILICAFE. Cooperatives market conventional and organic coffee. About 48% farmers sold their coffee through cooperatives, 45% through FBGs, 5.2% through both cooperatives and FBGs and lastly 1.6% selling to individual private buyers. About five FBGs were found in the study area. Income, tree density, delivery cost, labour, farmer training and age of coffee tree were statistically significant in influencing the level of coffee yield for all farmer categories. Investment cost was found to influence both yield and decision of farmers' to participate in specialty coffee market. Other factors which were also

significant in determining farmer's participation in specialty coffee market were technical assistance and presence of competitive buyers within a single village. In addition, transaction cost, premium price and membership in FBGs were also significant in determining the decision to participate in specialty coffee market as well as the degree of farmers' participation. Further more, age of the household head, years of schooling and payment arrangement were also important in determining the degree of farmer's participation in specialty coffee market. Generally the institutional arrangement in specialty coffee has helped small scale coffee growers meet the standards of the international specialty coffee market. Members of FBGs were paid higher price because of the improvement in coffee quality and shorter marketing channel which by pass the auction than cooperative members.

5.2 Recommendations

The key findings of this study revealed that the new institutional arrangements in coffee industry are also serving as marketing agent providing production and marketing services. Currently the competition in the coffee market in one way or another seems to improve the performance of cooperatives in serving as marketing agent. However, the present study has highlighted some recommendations which are important to the improvement of the performance of the institutional arrangements in specialty coffee industry to enhance more effective contribution to the household income and improvement of the living standard of coffee farmers at large.

i. Government should support FBGs on establishing the SACCOs which can provide service input much closer to farmers at lower costs to solve the problem of input

accessibility, quality and unaffordable price. This will enable farmers to comply with the required standards of specialty coffee

ii. The conducted survey found that, individual private buyers also buy coffee at a competitive price as well but without paying attention to the quality of coffee bought from farmers. This tendency needs serious attention because it hinders the strategies of improving the quality of produced coffee at small scale level. Government should also enable contracts to be enforceable and defaulters should be able to be taken to the court and punished.

iii. Reinforced contract plays a big role to ensure that the two parties explore the benefits. Majority of farmers in the study area responded to have informal agreement with FBGs or collectors. There is a need for FBGs to reinforce the relationship with members by having a written contract to ensure commitment and hence better performance of this institution.

iv. Following the contribution of coffee to the national income, there is a need for Government to scale up the lesson lent from FBGs into other coffee producing areas to stimulate the performance of institutions providing services to coffee industry as well as farmers themselves.

v. Since transaction costs seems to play a big role in farmer's decision to participate in specialty market, there is a need for Government to work closer to FBGs especially in designing a simple mechanism on the mobility of cherries from farms to the CPUs.

vi. Facilitation on the formation of FBGs in other crops is also important as other farmers have decided to work on other alternative crops such as banana and vegetables. FBGs will ensure provision of services in production and marketing improving the living standard of rural people.

5.3 Areas for further research

The present study concentrated only in coffee and in few areas within a single region because of resource constraints. Therefore, there are number of issues, which have not been covered thoroughly in this study which can be covered by other researches; these include:

i. Similar studies in other areas to compare these results. This is because the performance of FBGs can differ from one environment following resource availability, geographical location and other human resource capital.

ii. Researches on the available potentials within farmers' environment which can be explored by the existing institutional arrangements to enhance their sustainability and more contribution to the improvement of standard of living to farmers.

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APPENDICES

Appendix 1: Descriptive Results of surveyed Farmers Survey November/ 2008 and February/2009

Village surveyed

1. Kimangaro **10%**
2. Mawanjeni **10.4%**
3. Kiruweni **11.2%**
4. Lole Marera **10%**
5. Mrimbo uwo **12.4%**
6. Shari **9%**
7. Roo **12%**
8. Mudio **13.6%**
9. Mbweera **10.8%**

Age of household head **60 years**

Gender of the household head

1. Male **85.2%**
2. Female **14.8%**

Years of schooling of household head **6.79 years**

Household labour **2 adults.**

Sources of income

1. Agriculture (crops) **94%**
2. Livestock **2.8%**
3. Trade **0.4%**
4. Employment **2.8%**

Farm size **3.35 acres.**

Size of coffee plot **1.71 acres.**

Type of coffee produced

1. Specialty **22.8%**
2. Conventional **33.2%**
3. Conventional and specialty **37.2%**
4. Organic **6.8%**

Reasons for not producing specialty coffee

1. Do not know what speciality coffee is **20.3%**
2. Don't trust the buyer **4.7%**
3. Can not produce the required quality **9.4%**
4. Can earn more money without specialty coffee **34.4%**
5. Too expensive **23.4%**
6. Small production **7.8%.**

Experience in coffee production

1. Speciality **13.61 years**
2. Conventional **30.52 Years**
3. Organic **5.5 years**

Marketing channel for coffee

1. FBGs **32.8%**
2. Cooperative **43.6%**
3. Individual private buyers **1.6%**

Average coffee production from 2003/4 to 2007/08

1. Specialty **2.88 kg**
2. Conventional **64.33kg**
3. Conventional and specialty **33.60kg**
4. Organic **36.44 kg**

Average coffee price per Kg between 2003/04 to 2007/08

1. Specialty **1863.94%**
2. Conventional **1456.14%**
3. Conventional and specialty **1660.04%**
4. Organic **1276%**

Source of farm inputs

1. Buying **94.4%**
2. Credit **4%**
3. Buying and credit **1.6%**

Source of support for coffee farmers

1. Children/Spouse/Family **59.2%**
2. Cooperatives **6.8%**
3. Extension officers **20.8%**
4. FBGs **11.2%**
5. NGOs **2%**

Remoteness **0.5351 (Hrs)**

Mode of transport frequently used

1. Walking **38.4%**
2. Bus 0.4%
4. Pick-up **5.2%**

5. Bicycle **13.6%**
6. Wheelbarrow **42.4%**

Weather information on market price is received

1. Yes **89.2%**
2. No **3.2%**

Source of price information

1. Buyer **74%**
2. Friends **4%**
3. Churches and mosques **11.2%.**

Frequency of selling coffee per season **6.79**

If the buyer is trusted

1. Yes **96.8%**
2. No **3.2%**

Number of buyers contacted 2007/08 season

1. – 80.4%

2. - 17.6%

3. -2 %

Time taken by the buyer to pay a farmer

1. At delivery **91.6%**
2. Has to wait **8.4%**

Services received by buyer/ collector

1. Transportation **0.4%**
2. Monetary loan **0.4%**
3. Loan of seeds/inputs **20%**
4. Technical assistance **51.6%**

5. Received no service **27.6%**

Reasons for market preference

1. Higher price **34.8%**

2. No option **2.4%**

3. Assurance of payment **62.8%**

Deliver cost per production in 2007/8 **TSh. 14.19.**

If the household received training on coffee production for the last 12 months

1. Yes **57.6%**

2. No **42.4%**

Type of contract between buyer and producer

1. Written contract **6.4%**

2. Informal agreement **77.6%**

3. No any kind of contract **16%**

Investment cost **TSh. 69377.45**

Percentage of red-ripe cherries **91.68**

If the pulping is done on the same day as picking

1. Yes **87.6%**

2. No **12.4%**

Type of fermenting drums

1. Cement tank **4.4%**

2. Plastic drums **89.6%**

3. Wooden drums **2.4%**

4. Tins (debes) **0.8**

5. Aluminium pot **2.8%**

Fermentation period **1.88 (days)**

Coffee drying equipment

1. On the ground **0.4%**
2. On tables-wire mesh **95.2%**
3. Ground and tables **1.2%**
4. Ground and mats **2.4%**
5. Tables and mats **0.8%**

If coffee is protected from direct sunlight in drying process

1. Yes **77.6%**
2. No **21.2%**
3. Some times **1.2%**

The relation ship between the buyer and producer

1. Good **93.6%**
2. Bad **1.2%**
3. Has no effect **4.4%**
4. Don't know **0.8%**

Rating of farmers' standard of living based on income form coffee

1. Very good **50.4%**
2. Good **31.2%**
3. Not good/ bad **18.4%**

Other uses of land competing with coffee production

1. Banana **38.8%**
2. Vegetables **4.4%**
3. Animal fodder **2%**
4. Sugar cane **0.4%**

5. Nothing **54.4%**

Main constraints in coffee production

1. Weather **9.6%**
2. Input reliability **10.4%**
3. Higher price of inputs **72%**
4. No problem **3.2%**
5. Pests and diseases **4.8%**

Main problems faced in coffee marketing

1. Lower price **50.4%**
2. Transparency **1.2%**
3. Delay payment **2%**
4. Price fluctuation **12.8%**
5. Transport **3.6%**
6. No problem **30%**

Appendix 2: Prices (TSh.) paid to coffee farmers in Roo village

Year	QIP Members		Non QIP Members		Members of Roo- Gourmet Coffee Growers
	CPU	HP	CPU	HP	CPU
2003/4	-	-	837.38	784.16	1700
2004/5	-	-	1259.16	1302.34	1900
2005/6	1734.78	1665.30	1619.64	1593.75	2000
2006/7	1706.33	1688.80	1697.84	1654.04	2200
2007/08	2248.44	1320.70	2135.86	2122.68	2600

Source: **Survey results.**

Appendix 3: Coffee Classification Table

TANZANIA COFFEE BOARD

CLASSIFICATION CHART FOR MILD ARABICA COFFEE

CLASS	AA , A	PB , B	E , TT , AF	F	UG,HP&BUNI	TEX
1	FINE					
2	GOOD					
3	FAIR/GOOD	FINE				
4	FAQ +	GOOD				
5	FAQ	FAIR/GOOD	FAIR/GOOD			
6	FAQ -	FAQ +	FAQ +			
7	POOR/FAIR	FAQ	FAQ			
8	POOR	FAQ -	FAQ -			
9	VERY POOR	POOR/FAIR	POOR/FAIR	FAQ +		
10		POOR	POOR	FAQ		
11		VERY POOR	VERY POOR	FAQ -		
12				POOR/FAIR		
13				POOR		
14				VERY POOR		
15					POOR	
16					VERY POOR	
17					UNCLEAN	TEX