CHOICE OF MARKETING CHANNELS AND TRANSACTION COSTS: THE CASE OF MAIZE MARKETING IN BURA BORAMA, SOUTHERN ETHIOPIA

BY

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"Choice of Marketing Channels and Transaction Costs: The Case of Maize Marketing in Bura Borama, Shashemene Area."

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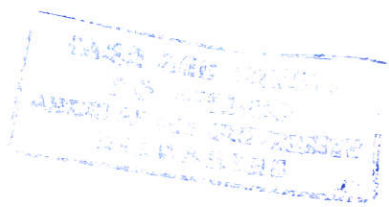
ACRONYMS

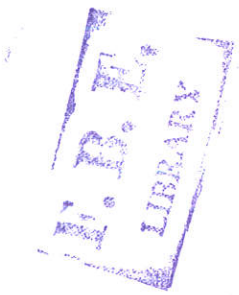
AMC	Agricultural Marketing Corporation
CSA	Central Statistics Agency
DA	Development Agent
EGTE	Ethiopian Grain Trade Enterprise
FAO	Food and Agriculture Organization
FGD	Focus Group Discussion
GDP	Gross Domestic Product
IIA	Independence from Irrelevant Alternatives
MCA	Marketing Channel Approach
MNL	Multinomial Logit
MoFED	Ministry of Finance and Economic Development
NIE	New Institutional Economics
PASDEP	Plan for Accelerated and Sustained Development to End Poverty
POs	Producers' Organizations
RATES	Regional Agricultural Trade Expansion Support Program
RRR	Relative Risk Ratio
TCE	Transaction Cost Economics
VIF	Variable Inflation Factor



ABSTRACT

The objective of this study is to identify the transaction cost factors and household characteristics that influence the decision of marketing channel choice by maize farmers in rural kebele of Bura Borama, district of Shashemene. The main hypothesis of the study is that farmers' choice of marketing channel is influenced by transaction costs (e.g information, transport, negotiation and monitoring costs) and household characteristics (e.g. age, education). Households facing higher transaction costs are excluded from using certain marketing channel. A multinomial logit model is used for empirical estimation using data from a survey of 103 maize farmers from Bura Borama. Empirical findings of this study reveal that the most important factors that explain farmers' decision of marketing channel choice are farmers' age, years of education, farm size, access to transportation, access to information, time spent to accomplish a one time sales and a possible delay in payment up on transaction. This suggests that government and/or other concerned institutions policy intervention should focus of reducing some of these transaction costs by providing institutional support to smallholder maize farmers in the study area. These supports could be in the form of improving access to market information, establishing producers' organization and improving the rural road networks which link production areas to markets.

Key word: Transaction costs, marketing channel choice, smallholder farmers, maize, Multinomial logit, Bura Borama



CHAPTER ONE: INTRODUCTION

Three out of every four poor people in developing countries live in rural areas with over 86 percent and 65 percent of them relied on agriculture as sources of livelihood and employment respectively (World Bank, 2008). With poverty being a rural phenomenon in Africa (including Ethiopia), development of efficient agricultural marketing is believed to be very vital to enhance the participation of smallholder farmers in the market and ensure the "poverty-reducing impacts of agricultural growth" (World Bank, 2008). Maize is an important staple food in Sub-Saharan Africa for around 50% of the population (Garki et al, 2004). This study also argues that given its unique features (see annex A) maize is more important than any other crop, to realize promise of meeting food security in Africa.

A well developed maize marketing chain that link smallholder farmers with the final market is highly important in Ethiopia to improve income of the poor farmers and reduce rural poverty. This is because maize is at the top of all cereals in terms of total area cultivated, volume of production and yield per hectare (FAOSTAT, 2008). Moreover, in Ethiopia maize is predominantly produced by smallholder and is a major staple food crop with over 80% of the total population are both primary producers and consumer of maize (Dawit et al, 2008) hence, related to food security to a large extent. Presumably, this has necessitated the Government of Ethiopia (GoE) to consider maize production and its marketing as a policy priority among other cereals under a Plan for Accelerated and Sustained Development to End Poverty (PASDEP). PASDEP envisages commercialization of agriculture with the intension of moving farmers beyond subsistence farming to small- scale market-oriented agriculture through provision of appropriate marketing infrastructure and credit services (MoFED, 2006; Jemal, 2008). Facilitating this transition requires a comprehensive analysis of the nature of these production systems (subsistence versus market-oriented), the marketing of these products as well as factors affection marketing and production performance.

However, in agriculture-based economies of Sub-Saharan African countries such as Ethiopia smallholder farmers are excluded from the market due to high transaction costs (information,

transportation, negotiation, monitoring, etc costs). This largely hampers the shift from subsistence production to commercially oriented farming systems.

A combination of the Marketing Channel Approach (MCA) and the theory of Institutional Economics can provide a framework to identify the factors influencing farmers' choice in marketing channel decision. With the intention of contributing to the government's policy priority area, this study tries to investigate the major factors (related to transaction costs and household characteristics) that determine the marketing decisions of maize farmers in Bura Borama kebele, one of the maize surplus areas within the districts of Shashemene. On the basis of a sample of maize farmers, a multinomial logit model is employed to estimate farmers' decision of marketing channel choice.

1.1 PROBLEM STATEMENT

A well functioning cereal/maize marketing is turned out to be very vital for agricultural growth and transition of smallholder farming towards commercial farming is determined by access to market. Jooste (2001) has noted that the transition of the small scale sector towards commercial production will ultimately be determined by its access to markets. Similarly, Randela (2005) argued that the development of markets, trade and the subsequent market participation that characterize commercialization are fundamental to economic growth. As Fernando (2006) pointed out an efficient agricultural marketing can smooth the transition from subsistence to commercial production systems. It is believed that access to reliable output markets significantly affects the efficiency of smallholder producers. However, cereal/maize markets are far from being efficient in Ethiopia. Despite a long experience in maize production, the farming methods remain traditional. The role of intermediaries (assemblers, wholesalers) is still dominant in maize marketing, leaving the market inaccessible for the smallholder maize farmers. Although the main steam market generates better return for producers, the majority of smallholder farmers couldn't able to participate in the main regional grain market. Maize farmers can sell their produce at four possible alternative market outlets. They may sell direct to consumer, sell to retail markets, sell to rural assemblers, and sell to wholesalers. Farmers' decision to select a particular market channel affects the quantity sold as well as the return obtained. Their decision where to sell is influenced by the various types of transaction costs (such as information, bargaining, monitoring, and transportation costs), and household characteristics.

Empirical studies Amaha (2001); Eleni (2001); Dereje and Abdissa (2001); Eleni and Goggan (2005:3) and Dender (2002) have focused on the performance of grain marketing in Ethiopia in general and have noted that the performance of grain market, despite the reform, remains poor largely due to missing markets, poor infrastructure, and high transaction costs. For instance, Eleni (2001) has noted that transaction cost particularly searching cost as well as transportation cost (distinct from transaction cost) determines trading exchange in the grain market. In her analysis transportation cost is categorized as physical marketing cost which is different from transaction costs. However, literatures on marketing channel choice including Hobbs (1997); Boger (2001); Ferto and Szabo (2002); Irini Maltsoglou and Aysen Tanyeri-Abur (2005:6);ForhadShilpi and Dina Umali- Deininger (2007:9); Lu (2007), have considered transportation costs as a significant part of transaction costs and this paper follows the same argument. This is because the higher the distance (higher transaction costs) reduces profit. The time spent in organizing means of transportation and road conditions can be used as attributes/proxies to estimate transportation costs. In addition to this, RATES (2003) has conducted a value chain analysis for the maize sector taking the whole maize producing areas in the country at large. However, this study just describes the maize value chain structure and doesn't attempt to quantify the level of farmers' integration to the market as well as the factor that influence producers decision where to trade their produce. Neither it describes the kind of chain coordination (governance) prevailed within the chains nor explain the influence of transaction costs on the way returns distributed among chain participants. Thus, although there is a wealth of literature on grain marketing in Ethiopia, to the best of my knowledge, research on a commodity specific (such as maize) market channel choice in grain markets employing transaction cost economics is scant. This forms the motivation for this study to contribute to this gap by investigating the factors that determine farmers' decision to select a particular market outlet to trade their maize product. Although the main focus is on Bura Borama, most conclusions can have a wider application in the other parts of the country where maize is a dominant smallholder practice.

The main research questions this paper tries to raise are the following:

1) How is the maize marketing chain organized? How does it function? Who are the main actors?
2) What factors determine optimal choice of marketing channel by maize farmers in the study area?

The underlying hypothesis of this study is that maize farmer's choice of alternative marketing channel is influenced by the different forms of transaction costs and household characteristic factors. To answer this question, the study attempts to build a model that would explain how and why farmers choose the types of market channels that they use to sell their maize. Several variables are used to see which ones are significant in the decision making process. These transaction costs may be revealed in the forms of information, bargaining, monitoring, transport costs. The household characteristics include variables such as age, education, farm size, and family size. These transaction costs and household characteristics explain why farmers select different marketing channels with different return while maize may be homogenous commodity in the same location.

1.2 OBJECTIVE OF THE STUDY

The purpose of this study is to describe and understand the maize marketing chain and to investigate the extent to which transaction costs and farm characteristics influence farmers' decision of marketing channels. The study has the following specific objectives:

1. to identify and describe the marketing chain structure prevailed in the study area
2. to identify and explain the type and nature of transaction costs that influence farmer's decisions regarding the choice of maize marketing channels in the study area,
3. to identify household characteristic which determine the choice of one marketing outlet over others

1.3 SIGNIFICANCE OF THE STUDY

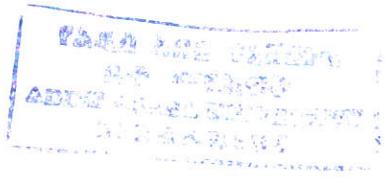
To set a policy priority to tackle transaction cost problem, it is imperative to analysis how farmers are affected by those costs. It is hoped that the main findings of this study would be expected mainly to contributed to improve the activities of the institutions participate in cereal marketing (such as maize) NGOs, Ethiopian Commodity Exchange (ECX) and government extension services, donors and agricultural development researchers willing to contribute positively to the standard of living of smallholder farmers through improving efficiency of agricultural market. Recommendations from this study would also help identify the factors influencing smallholders' marketing decisions and participation in agricultural markets for improving agricultural market development activities in Shashemene area. The main beneficiaries of this study would be the smallholders, suppliers of agricultural input and services and consumers of smallholders' outputs.

1.4 LIMITATIONS OF THE STUDY

Most of the variables that would be estimated were based on recall method by the farmers. We had to trust their ability to recall and precision on estimating variables like land parcel sizes, production quantity, volume of sales, distance traveled and time spent to reach to market place. Another limitation is that the paper only attempts to test the marketing channel choice decision behavior of farmers. It did not attempt to evaluate the choice behavior within the market channels among the different chain participants. Missing values and other omissions on the survey instrument reduced the number of observations by seven, decreasing the final sample size of our study.

1.5 ORGANIZATION OF THE PAPER

This study consists of seven chapters. Chapter two provides background notes on maize marketing and processing in Ethiopia. Chapter three deals with literature review on previous researches done in the area. Chapter four provides the data sources and research methodology employed in the study such as survey design, data collection and an empirical model for analysis of the survey data. Chapter five presents the descriptive characteristics of the households surveyed. Chapter six discusses the empirical model and results of the model used. The last chapter, 7 deals with conclusion and recommendations of this study



CHAPTER TWO: CONCEPTUAL ISSUES AND THEORETICAL PERSPECTIVES

2.1 INTRODUCTION

The functioning of agricultural marketing in developing countries is hampered by high transaction costs incurred during market exchange. As stated by Bart and Kyle (2000) note the existence of transaction costs is turned out to be the major reason why most food markets in developing countries still suffer from inefficiency despite the profound efforts to liberalize markets since 1990s. Access to markets provides opportunities for smallholders to improve their incomes and livelihoods because it increases the effective price farmers receive for their products, cetrus paribus. Empirical studies in Guantamala (vegetables), Malawi (tobacco), India (dairy), and Kenya (sugarcane) have shown that increase income for smallholders has been associated with adoption of commercial farming (Minot and Hill, 2007). However, evidences also show that increased transaction costs hinder the efforts of development agents along with governments to ensure small holders and other rural poor benefit from commercialization either through participating in the market or drawing income from off-farm employment. Thus, strategies designed to reduce transaction costs could have a paramount significance in encouraging farmers to see beyond subsistence production towards market-oriented production.

A combination of Marketing Channel Approach (MCA) and Transaction Cost Economics (TCE) can provides a useful framework to describe and understand the factors influencing the marketing behaviors of farmers and the way cereals such as maize is transacted in Ethiopia. This chapter explores the way marketing channels are organized so as to disentangle how transaction costs influences farmers marketing behaviors and related issues by reviewing various literatures from different country experiences. Before elaborating how transaction costs influence farmers marketing behavior and decision to select a particular marketing channel, the chapter provides theoretical and empirical explanation of transaction costs.

As Kahknonen and Leathers (1999:3) point out the total cost of an economic activity can be expressed as the sum of production costs (but it is not the interest of this paper) and transaction

costs[1]. They state that production costs deals with the technology and input aspects whereas transaction costs depend on the way transactions are organized. Hualiang (2003: 5) describes transactions as a principal unit of analysis in transaction cost economics where it occurs during the exchange of good and services among individuals.

2.2 TRANSACTION COST ECONOMICS (TCE)

2.2.1 Definition and Concepts

The underlined concept behind transaction costs is derived from Coase Theorem which specifies that "if private parties can bargain without costs over the allocation of resources, they can solve the problem of externalities on their own" (Sschmid, 2006:20). In relation to this argument, Kahnonen and Leathers (1999) argue that transaction costs exist due to "the fact that the production and consumption are done by separate economic agents." This implies that transaction costs are associated with uncertainty or imperfection in information and different transaction costs are generated until the produce reaches the final consumers. The types of activities that frequently cause transaction costs include:

- searching market information and screening market opportunities
- negotiation and elaboration of contracts
- handling of produce (i.e. storage, transport, administrative costs, and claims)
- monitoring and enforcement contracts (e.g. costs of quality control) (GTZ, 2007:23; Sschmid, 2006:20; Hualiang, 2003: 5)

From an economics perspective, as Hualiang (2003) expressed, transaction costs is defined as the cost of measuring what is traded as well as the costs of monitoring compliance with the agreement.

[1] Transaction costs in this paper are defined to include transportation costs in addition to information, negotiation, and monitoring costs. The time spent by farmers in searching means of transporting their maize to the market is considered to be part of transaction costs.

2.2.2 Assumptions

The Neo-Classical Economic Model[2] assumes that transaction costs are zero as agent's access information perfectly and makes rational decision. Unlike this assumption, however, New Institutional Economics (NIE) assumes that transaction costs do matter. As a branch of NIE, Transaction Cost Economics (TCE) uses transaction costs as a unit of analysis. TCE is based on the following behavioral assumptions:

i) ***Bounded Rationality.*** This assumption states in the words of Hobbs "although people may intend to make a rational decision, their capacity to evaluate accurately all possible alternatives is physically limited," Jill. E. Hobbs (1999). According to Lu (2003), this causes a problem in a situation where there is uncertainty and complexity.

ii) ***Opportunism.*** This behavior can occur ex-ante (adverse selection)[3] or ex-post (moral hazard)[4]. It means as Sschmid (2006) points out that "economic agents act according to their own interest and tries to maximize their benefits". He also state that these people "even use strategic disclosure of information, first mover advantage at contract renewal or calculated misleading to get more benefit."

iii) ***Informational Asymmetry.*** As Hobbs (1999) states informational asymmetry :

> *arises when there is public information available to all parties but also private information which is only available to selected parties, so that all parties to the transaction no longer possess the same levels information. (Hobbs,1996: 5)*

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[2] TCE relaxes many of the perfect competition assumptions of neoclassical economics. These are homogenous products, many buyers and sellers, perfect information, absence of entry barrier, rational economic agents, perfect mobility of resources, well-defined property rights, and institutions are ignored (or assumed to be fixed). However, TCE as branch of New Instructional Economics argues that information is not always perfect that transaction costs can be high and that the costs of undertaking transactions can't be ignored (Irini Maltsoglou and Aysen Tanyeri-Abur; 2005:2).

[3] Adverse selection is defined as a "situation where one side of the market can't observe the type or quality of the goods on the other side of the market" (Sschmid, 2006:26)

[4] Moral hazard is defined as a "situation where one side of the market can't observe the actions of the other" (Sschmid, 2006:26)

Informational asymmetry is also the sources of adverse selection and moral hazard problems which in turn lead to opportunistic behaviors.

2.2.3 Dimension

The following three critical dimensions of transactions are identified in the literatures (Hobbs, 1996:7; Lu, 2003:7), the frequency of the transactions, the degree of uncertainty surrounding the transaction; the degree of asset specificity. The most important attributes of transaction cost is asset specificity.

i) Frequency

As Lu (2003) points out what governance structure to be employed depends on the frequency of occurrence of transactions. Thus, bilateral relationship is suggested for frequently occurred transaction while a hierarchical relationship is advised for events where one agent transacts with less frequency than the other. According to Hobbs (1999), in repeated transactions, the problem of opportunistic behavior will be lesser than that of more infrequent transactions.

ii) Uncertainty

As mentioned earlier, uncertainty is one of the transaction elements that bear additional costs and poses the problem of bounded rationality. This happens due to the inability of agents to write a prior comprehensive contract because of the fact that all of the situation cannot be specified before hand. (Lu, 2003:7)

iii) Asset Specificity

Hobbs (1996) argues that "asset specificity arises when one partner to an exchange has invested resources specific to that exchange which have little or no value in an alternative use." Lu (2003:8) describe it as "the degree of the use of an investment made specifically for the transaction" where the "return to the investment depends on the continuity of a specific exchange".

Asset specificity may be of five types. (1) Site specificity- refers to the special location or site of the asset as compared to other factors affecting the transactions (e.g., co-location of an electric plant and a coal mine). (2) Physical specificity- refers to the use of specialized instruments desired for the transaction (e.g., specialized tools and equipments). (3) Human specificity- which refers to firm-specific knowledge acquired by the firm through education or learning. A transaction that involved with high skill is described as more human asset specific as compared to a transaction with low skill. (4) Temporary specificity- refers to the products' value as constrained by time. This type of asset specificity is more relevant for vegetable and fruit products and hence not considered in this study. Dedicated specificity- refers to distinct investment which involves brand name capital. In the maize marketing this is not also relevant as maize products sold in wet markets without brand name. The higher the asset specificity means the higher will be the market transaction costs. Lu (2003) indicates that asset specificity is imperative because once an investment has been made; both buyer and seller will be operating in a bilateral relation for a considerable period thereafter.

In the case of agricultural food marketing in developing countries such as maize marketing in Ethiopia, physical and human forms of asset specificity may be very relevant. An example of physical asset specificity could be land/farm size, use of fertilizer and pesticides. For human form of asset specificity, family size as well as the education level of the farmers can be cited as an example.

2.3 ANALYZING TRANSACTION COSTS IN AGRICULTURAL MARKETING

It has been learnt that transaction costs significantly affect the agri-food marketing chain. Analyzing transaction costs is important because value occurs when needs are met through the provision of products, resources, or services- where transaction or exchange involves. In analyzing the inefficiency associated with transaction costs at every stages of the chain, it is quite relevant to clearly specify the contents of transaction costs as well as the ways of measuring these costs.

2.3.1 Identifying the types and sources of transaction costs along the marketing chain[5]

Studies on transaction costs have identified three main classifications of transaction costs: information costs, negotiation costs, and monitoring costs. Information costs include costs that are incurred before the transaction is made. These are costs for buyers (e.g. learning about the products and services of the sellers and the basis for their costs, profit margins, and quality), and for sellers (e.g. learning about the legitimacy, financial condition, and need of the buyer). Negotiation costs are bargaining costs that involve during the development of the transaction. These include costs incurred by buyers and sellers during establishing a contract.

Monitoring costs normally exist after the transaction is made. These costs are related to the costs of assuring that everything is going as per the agreement.

[5] In this study marketing chain also refers to marketing channel.

Based on a recent study on transaction costs, it is possible to split transaction costs in to six types and illustrate their sources as well as the hidden nature of such costs. This can be presented in the following table.

Table 2.1: Transaction cost sources and tangible forms

TYPE OF COSTS	SOURCE/ORIGIN OF COSTS	TANGIBLE FORM OF TRANSACTION COSTS
Searching costs[a]	Lack of knowledge about opportunities (e.g. products, prices, demand, supply trading rights, market outlets)	Personal/personnel time, travel expense, communication costs, advertising/promotion costs
Screening costs	Uncertainty about reliability of the potential suppliers/buyers; uncertainty about the actual quality of the goods/services offered.	Consulting/service fees; costs of credit rating checks
Bargaining costs	Conflicting objectives and interest of transacting parties uncertainty about the willing-ness of others to trade on certain terms; uncertainty over transactor rights & obligations	Licensing fees; insurance premium.
Transfer costs[a]	Legal, extra-legal or physical constraints on the movement/ transfer of goods.	Handling/storage costs; transport costs; bribery and corruption expenses
Monitoring costs	Uncertainty about transactor compliance with specified terms; uncertainty about possible changes in the quality of goods & services	Auditing fees; product inspection charges; invet-ments in measurement devices
Enforcement costs	Uncertainty about the level of damages/injury to a transacting Party arising from contractual non-compliance; problems in exacting penalties through bilateral agreements or through use of third party.	Arbitration, legal court fees, costs to bring social pressure

Source: Loader and Hobbs, 1996: 27

[a] these types of costs are believed to be most important in this study.

2.3.2 Measuring transaction costs

The application of Transaction Cost Economics on problems of agri- food chain has become increasingly familiar in agricultural economics since 1990s. The problem with this approach, however, is how to quantify and measure transaction costs. Numerous empirical studies show that measuring transaction costs is challenging at least for two reasons. First, transaction costs are not available on financial records. Second, transaction costs are not easily observed, i.e. transaction costs can not be quantified ex-ante. As Elleni (2001) states the unobservable nature of transaction costs emanates form the fact that transaction costs are specific to individual economic agents and hence endogenous to the behavior of agents.

There are a number of empirical studies on the effects of transaction costs on agricultural marketing despite the difficulty in quantifying and measuring these costs. For instance, Ferto and Szabo (2002) cites (Frank and Hunderson, 1992) who analyzed the effect of transaction costs as determinants of vertical coordination in 42 US food industry using OLS regressions. Hobbs (1997) applied a two- limit tobit model to measure the importance of transaction costs in cattle marketing affecting the choice between live-ring auction and direct-to-packer sales where transaction cost variables such as grade uncertainty, the risk of non sale at auctions, time spent at the auctions and adequacy of the packer are found to be relevant. A multinomial logit model was applied by Boger (2001) to examine the marketing arrangements between polish hog producers and buyers. A similar multinomial logit model was applied by Imre Ferto and G. Szabo (2002) to reveal on the determinants that influence the choice of supply channel in Hungarian fruit and vegetable sector. Meike and Manfred (2006) applied a two- stage model to analysis farmers' marketing decisions and their effect on the price received. They argue that this analysis is very useful to control for the endogeneity bias introduced by the marketing choice. Eleni Gebremedihin (2001) also applied a two- step probit model to analysis marketing choice by traders and their decision whether to use broker on their behave. She found that the prevailing high transaction costs made traders to prefer broker whereas high social capital tends to reduce the use of broker. Lu (2003) cited (Garth et al (1999) who applied a Tobit model on data collected from dairy farm households in Ethiopian Highland and showed that cooperative selling institutions have the potential to reduce transaction costs, simulating entry in to the market, and

precipitating growth in rural communities. The study identified two variables to determine transaction costs. These variables were distance and market surplus.

In his recent article, Lu (2005) analysis the role of transaction costs in determining tomato market chain efficiency in China using a "two- stage value chain model" as well as tobit model. In his earlier study, Lu (2003) adopted the following four categories of transaction costs (see table 3.2) that strongly influence the technical efficiency of marketing chain and relevant for rural markets in developing countries such as Ethiopia. The different attributes that are used as a proxy to measure transaction costs are indicated in the following table.

Table 2.2 Variables used to Evaluate Potato Market Transaction Costs

Costs	Transportation costs	Information cost	Negotiation costs	Monitoring costs
VARIABLES	Condition of road	Membership in an association	No. of times farm households went to negotiate price	No. of times farm households approached merchant for payment
	Distance to market (km)	Price farm households get	Possibility of approaching other buyers	Farm households had problems receiving payments from merchant
	Time to market (min)	No. of days delay in learning price		Farm households can demand that merchant recognize product quality
		No. of traders who visited before selling		Merchant delivers supporting document
				No. of years farm households have know merchant

Source: Lu (2003)

In sum, the above empirical evidences indicate that transaction costs approach has become an important framework to analysis economic agents in agri-food sector. Although it is very difficult to measure transaction costs directly (as they are not observable), different economists try to

identify relevant attributes of transaction and calculate transaction costs. In this paper an attempt will be made to identify important attributes of transaction costs that influence maize farmer's marketing behaviors and the decision where to sell.

2.4 MARKETING CHANNEL APPROACH

Following liberalization there appears different ways or market out lets in which maize product reaches final consumers. This, in the presence of well functioning cereal markets, is very useful because it enables the market agents including farmers to choose between the appropriate outlets needed. To describe the exchange of cereals such as maize from a producer to a consumer, it is very useful to depict it as a channel through which cereals are transacted. In the channel, the cereals move from one intermediary to the other, all of whom accomplish some tasks to make the product available to the final consumer.

Mandefro, et al (2001) describes marketing channels as chains that "connect farmers and consumers over time and space". According to Mandefro, et al (2001:4):

> *the food grain flow begins with the farmers, who, after harvest, decides how much he [she] wants to store for household consumption, seed and payment in kind and sells the remaining food grain (market surplus) to a trader or consumer in order to settle debts and contributions, taxes and to purchase consumer goods.*

Thoma Awuor (2007) also describes marketing chain as channel that link flow of commodity from its conception to final users. The marketing channel is the chain of marketing activities that a product flows through various transaction nodes on its way starting from the farmers or producers to consumers. The main activities involved in the marketing channel include production, transportation, packaging, processing etc.

The transaction of cereals such as maize from a producer to a consumer can take many different forms. A producer can sell directly to a consumer, or exchange can proceed through a number of intermediaries (e.g. assemblers, wholesalers, retailers). Figure 2.1 below depicts an example of a marketing channel.

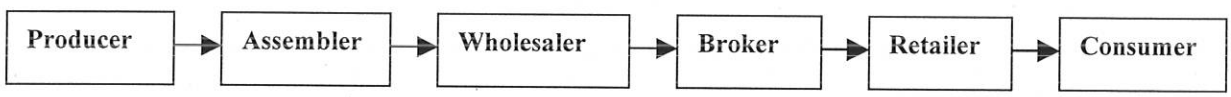


Figure 2.1 Example of a marketing channel

2.5 EFFECTS OF TRANSACTION COSTS ON FARM HOUSEHOLDS

Transaction costs are faced by all parties involved in the transactions. Transaction costs are household specific and the types of marketing channels used give insights on the existence and effects of these costs in agricultural marketing. The following are assumed to have effects on farmer households in relation to agricultural marketing.

To start with, searching and acquiring appropriate market information is turned out to be major aspects of transaction costs. Abdulahi and Delgado (1999) associated the decline in the cost of transaction costs with low cost of information resulted from better access to different sources of information. Strasberg et al (1999) found that increased human capital has significant positive effects on the efficient use of market information. The study by (He and Yang, 1999) cited by Makhura (2001) noted that farmers in some regions of China obtained their market information from different sources; neighbors (31%), TV, newspaper and magazine (20%), and through carrying out investigation on markets (13%). A similar study by (He et al, 1991) cited by Makhura (2001) revealed that although these accesses lower transaction costs, farmers encountered high transaction costs due to small transaction scale, outdated information and a disordering marketing system. Another study by Fenyes and Groeneward (1985) associated insufficient market information to the presence of large number of small producers, inefficient communication systems and low level of literacy. Other important component of transaction cost to be considered is transportation cost. It is very apparent that in developing countries, the ability of smallholder farmers to get access to market is limited mainly because of high transportation costs associated partly with poor road infrastructure and partly with the issue of distance and time required to transport products the market centers, Prabhu et al (2005). In addition to increasing transport costs, inadequate transportation infrastructure increases searching and monitoring costs. Abdulahi and Delgado (1999) argued that better road infrastructure reduces the cost of transport flows and hence reduces transaction costs.

Transaction costs have an effect on the choice of grain marketing channel and the type of market outlet used farmers may be indicative of the specific forms of transaction costs encountered by households. Farmers choose marketing channel that are less costly. For instance, Eleni (2001) has found increased use of grain brokers by farmers in the presence of high transaction costs and less

dependent on grain brokers where farmers face low transaction costs due to good social network that created better information on price and market. A study on vegetables smallholder farmers in Southern Africa revealed that farmers used different channels such as fresh product markets and direct sell to consumers, Mathye et al (2000). The study also identified problems related to transport, searching markets and level of education as major influences on market participation by smallholder farmers. As pointed out by Prabhu et al (2005), transaction costs are also influenced by household-specific characteristics such as age, level of education, gender and social networks and organization. These factors affect transaction costs differently. Age of household head can be used as a proxy for farming experiences. As age increases, households may tend to face lower transaction costs because it may reflect more experience, trust and reputation acquired through repeated exchange with the same party (Goetz, cited by Matungul, et al, 2001). Transaction costs tend to be higher for farmers with low or no education as they face constraints to gather and analyze relevant information as compared to educated farmers. Put differently, the time taken to gather, process and use information decrease with education. The existence of cooperatives or farmers' organization may be vital in reducing transaction costs because it enables smallholder farmers to overcome constraints associated to market-related activities, Prabhu et al (2005).

2.6 REDUCING TRANSACTION COSTS

Due to difficulty to separate transaction costs from production costs, it is not always easy to design policy priorities to reduce transaction costs in agricultural marketing. Moreover, the fact that transaction costs vary across households, commodities and regions imply absence of a uniform strategy to intervene in order to reduce transaction costs. Be this at it may, various studies have identified different ways in which smallholder farmers participation could be development trough reducing the various forms of transaction costs faced by these farmers.

As indicated earlier, transportation cost is a major component of transaction costs in agricultural markets of developing countries. Expanding rural feeder road networks will reduce both the time spent in finding means of transportation and costs of transporting the product to markets. Considering the time before and after a road-building project in Bangladish, a study has shown

that after rural feeder roads were built transaction costs reduced by 36-38 %; lowered fertilizer prices by 45-47 percent; increased staple crop price by 3-5 percent and increase per capita household expenditure by 11 percent, Minot and Hill (2007). Establishing Efficient Farmers' Supporting Institutions is considered to be very essential to reduce transaction costs. According North (2000), institutions are pertinent instruments to make market efficient and reduce costs of market exchange related to uncertainty, imperfect information, poor property rights and inefficient contract enforcing mechanisms. Farmer's access to appropriate market information reduces adverse selection and moral hazards as farmers can be in better position to screen and monitor potential buyers. North (2000) also argues that establishment of efficient formal institutions should be supported by enabling political and legal systems. Development of farmer organizations or cooperatives for marketing, if well managed, is imperative to organize smallholders to market their product together and enjoy economies of scale thus reduce costs. Minot and Hill (2007) note that recent developments in organizing farmers in the upland of Laos and Vietnam (International Center for Tropical Agriculture), and India have proved successful in reducing costs. Moreover, farmer cooperatives can also provide access to credit and important inputs for their members. For smallholder farmers, collective actions by producer organizations are imperative to reduce transaction costs in markets and increase market power, World Bank (2008). Further more, provision of appropriate information on current prices of the nearby markets to farmers increases farmer's bargaining power for higher price during transaction with traders. The government and farmer organizations can play important role in disseminating relevant information to farmers and traders using various forms of mechanisms. The involvement of private sectors in providing market information is also very essential. Taking the experiences from India, Minot and Hill (2007) have noted the useful involvement of private companies in taking the initiatives to set up internet centers where farmers and traders can obtain agricultural price information and even conduct transactions.

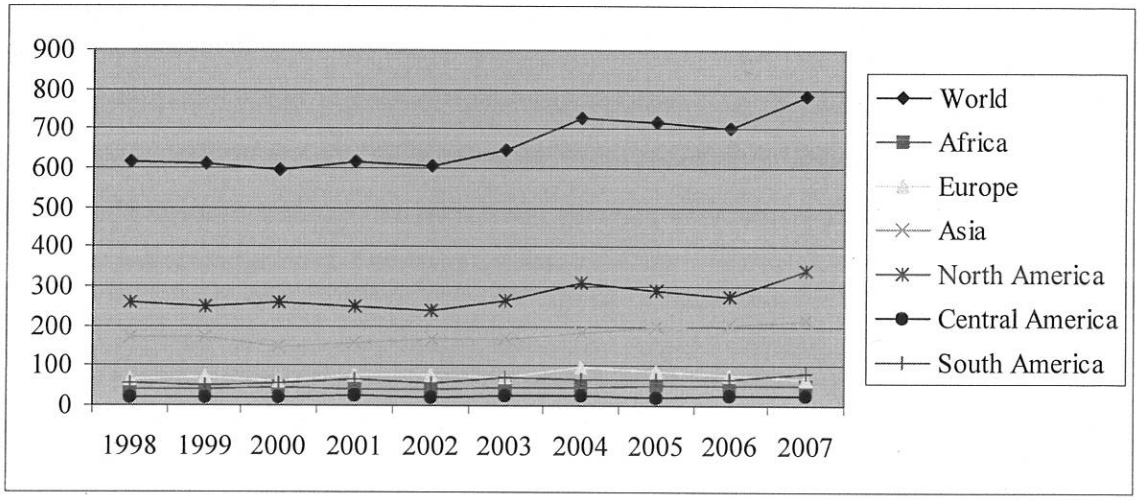
CHAPTER THREE: MAIZE MARKETING IN ETHIOPIA

This chapter provides a brief description of the structure and performance of maize (cereal) marketing and processing in Ethiopia. It starts by reviewing the major trends in maize production and consumption at the world level and also briefly discuss the relevance of transaction costs in maize marketing in Africa. Information on maize/cereal production is obtained from Food and Agriculture Organization (FAO) online database as well Central Statistics Agency (CSA) online database.

3.1 REVIEW OF WORLD MAIZE PRODUCTION AND CONSUMPTION

Maize is the third largest planted crop after wheat and rice. It is mostly used and traded, as a leading feed crop but is also an important food staple. In addition to food and feed, maize has wide range of industrial applications as well; from food processing to manufacturing of ethanol. Over the past two decades, global maize production has increased by nearly 50 percent, or 1.8 percent annual compound growth rate. Most of the increase in world maize production during the past decade can be attributed to a rapid expansion in Asia and an evolving high demand for the preparation of ethanol. North America is the leading maize producing country in the world followed by Asia and Europe (Figure 3.1).

Figure 3.1 Trends in world maize production by regions, 1998- 2007 (million of tones)



Source: FAO online database (2008)

Globally, around 65 percent, of total world maize production is used for feed purposes while around 15 percent is used for food and the remaining mainly destined for various types of industrial uses. United States of America is the leading country in the world to use maize as animal feed and for the preparation of ethanol. For instance, in 2005 it was estimated that nearly 55 percent of the domestic maize production was left to feed lives stocks. Another 18 percent of domestic maize production was exported to the world market while 14 percent was fermented into ethanol. This has turned the United States to the world's leading maize-based ethanol producer (Abdolreza, 2006).

Table 3.1: Top ten maize producers in the world in 2005 (million of tones)

Country	Production
USA	280.2
China	132.6
Brazil	34.9
Mexico	20.5
Argentina	19.5
India	14.5
France	13.2
Indonesia	12.01
South Africa	12
Italy	10.6

Source: FAO online database 2008.

Global trade in maize has increased significantly over the past two decades, from 55 million tones to around 80 million tones, with the fastest expansion taking place in more recent years. The United States is the world's largest maize exporter, which accounts for roughly 60 percent of the global share, followed by Argentina and China. Brazil, the Republic of South Africa and Ukraine are among a few other countries, which often have surpluses for exports (Table 3.2). From Tables 3.1 and 3.2, it can be seen that USA is the world's largest maize producing and exporting country, accounting for overt 40% the total maize produced in the world and nearly 60% of total maize export in the world market in 2006.

Table 3.2 Exporters of maize, 2006 (million of tones)

	Volume of export
USA	57.9
Argentina	10.4
China	3.1
Brazil	3.9
Ukrain	1.7
Romania	0.2
South Africa	0.6

Source: FAO online database (2008)

3.2 TRANSACTION COSTS IN MAIZE MARKETING CHAIN/CHANNEL:IT'S RELEVANCE IN AGRI- FOOD MARKETING IN AFRICA

In explaining how transaction costs analysis is relevant for agricultural policy in developing countries, Mylene and Kirsten (2002) took the following paragraph from North (2000).

> *The cost of transacting, to put it in its bluntest form, is the key to economics performance. When I go to third world countries and look at why they perform badly and examine how factor and product markets are really working, in every case, be it capital, labour or product markets, one observes that the cost of transacting is high. This high cost of transacting results in the economy performing badly because it is costly for human beings to interact and engage in various kinds of economic activity that the result is poor performance and poverty and so on. Where this takes us, of course, is to try to understand why the cost of transacting is so high...(Mylene and Kirsten, 2002:118-19).*

In relation to the above explanation Makhura (2001) also specify that transaction cost analysis is very important to understand food marketing in developing countries such as Africa. This is based on his argument that transaction cost analysis:

> *... is essentially relevant for agricultural marketing analysis in developing countries because many of the institutions, or formal rules of behavior, that are taken for granted in developed countries which facilitate market exchange are absent in low-income countries.*

The study on African house hold showed that markets are missing and according to Makhura (2001), in the absence of food markets households must be self-sufficient in terms of food, which confines their ability to relocate land and labor to cash crops. As a result of this, small households face wide margin between low selling price and high buying price. The study in South Africa's developing areas recognized the existing low level of market participation of small-scale farmers due to high transaction costs. Various studies on maize marketing chains in Africa have identified the following as determinant sources of transaction costs (Kahknon and Lethers, 1999; RATES, 2003).

i) small-scale farmers are located in remote areas far away from service providers and major consumer of farm products (i.e. distant from market)
ii) poor and inadequate infrastructure
iii) poor access to assets and information.

In relation to this, Ruled Ruben et al (2007:22) argue that business transactions in developing countries are characterized by uncertainty, information asymmetries, opportunism. Thus, transaction cost analysis is very useful to explain why markets might be missing in the product as well as other markets. According to Collinson et al (2002:113) the following functional steps can be identified in maize marketing chain in the domestic markets.

i) from farm gate to agents/traders store/rural market in rural areas
ii) from rural market to urban market
iii) from urban markets to major buying centers out side the districts of maize production.

In order to reduce the impact of transaction costs in agricultural marketing and improve relative net gains to farmers, Collinson et al (2002:113) have underlined the importance of forming farmers groups. As they clearly indicated:

> *the pooling of producer and its sale through farmers marketing groups is the most important methods of reducing transaction costs by achieving economic of scale, improved quality, minimizing losses and improving net prices to farmers.*

3.3 AGRICULTURE IN ETHIOPIA'S ECONOMY

> *In the 21st century, agriculture continues to be a fundamental instrument for sustainable development and poverty reduction. (World Bank, 2008:1)*

The above quote from the recent publication of The World Bank on World Development Report (2008) exactly sounds to the reality in Ethiopia where Ethiopia's economy is agrarian in its nature and outlook. Agriculture has still remained the mainstay of the national economy, contributing 55% of Gross Domestic Product (GDP), over 90% export earning, and providing employment for over 85% population (Getinet et al, 2001:1; RATES, 2003:1). The country has a great potential for agricultural development with total area of 113 million hectare of which 65% is estimated to be arable (RATES, 2003). The main foodstuffs produced are teff, maize, wheat, sorghum, barely etc. Besides food crops production, coffee, cotton, pulses, oil seed, fruit and vegetables are the main cash crops. The two major activities of agriculture, namely, crop production and livestock husbandry cover above 86% of the agriculture GDP (Getinet et al, 2001:1; RATES, 2003:1). Agriculture production is still predominantly rain-fed, non-market oriented, and based on rudimentary technologies, and subsistence small-scale farming and the average farm size is 0.8 hectare (RATES, 2003). The small holders cover about 96% of the cultivated land. As compared to Sub-Saharan African countries, agricultural production in Ethiopia is characterized by low technology and low production (Getinet et al, 2001:1; RATES, 2003:1). In addition, the farmers are not organized in accessing inputs and marketing their products efficiently; there by incurring high production costs and transaction costs that affects the competitiveness as well as profitability of their business. Given poverty in Ethiopia is a rural phenomenon, reducing these costs is imperative to improve sustained rural income and reduce poverty. This requires "a productivity revolution in smallholder farming [such as maize]" by

increasing productivity, making food markets work better as well as reducing the transaction costs during exchange, World Bank (2008).

According to data from FAOSTAT (2008), Ethiopia is the fourth largest maize producer in Africa in 2007, which may generate a comparative advantage to the country to involve in regional marketing in Africa (Table 3.1).

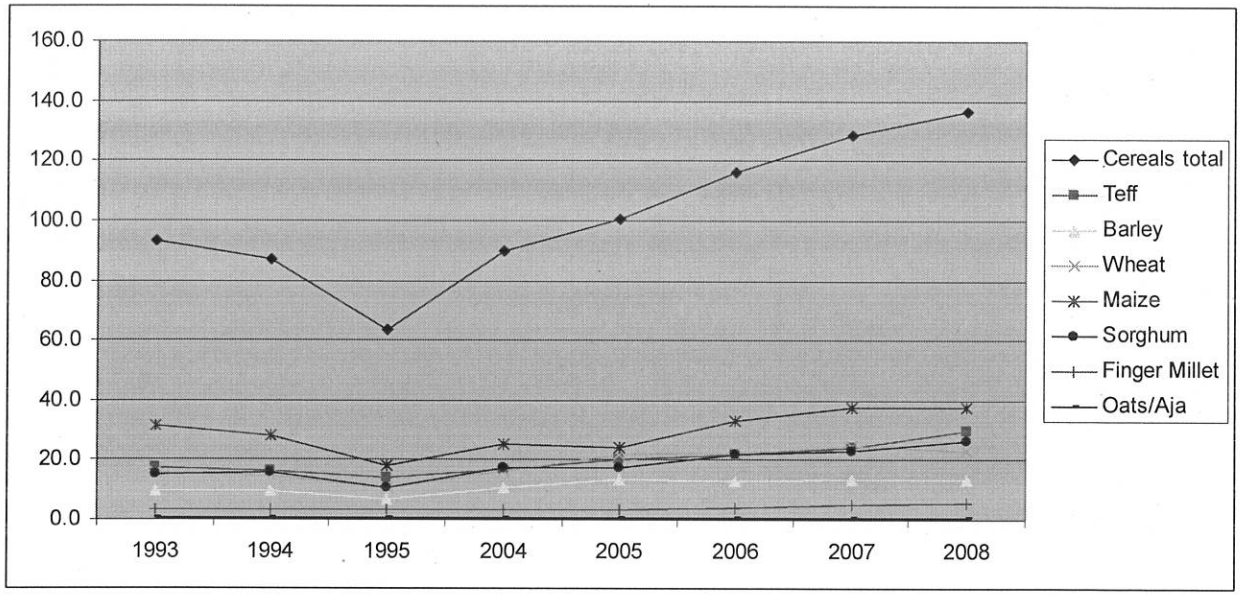
Table 3.3 Top 4 maize producers in Africa (tones), 2003-07

	Volume of maize production (tones)	
	2007	2003-2007
South Africa	7338738	9080962
Egypt	7045000	6883713
Nigeria	7800000	6325400
Ethiopia	4000000	3518339

Source: FAOSTAT, online database, October (2008)

According to CSA (2008) data, maize production has shown increase in the subsequent years after 2005 except a slight decline in 2008 due to shortage of rain among other things (Figure, 3.2).

Figure 3.2: Cereal Production trends, 2004-2008 (millions of quintal)



Source: CSA online database (2008)

Comparing cereal production in Ethiopia, maize assumes the largest proportion in terms of volume of production and yields per ha. Out of 136.5 million quintals of total cereal production in the country in 2008 harvesting season, maize production accounted for 25.7% followed by teff (21.9%), sorghum (19.5%) and wheat (17%). Considering the same cropping year (2008), yields per hectare of maize was 21.2 followed by sorghum (17.3) and wheat (16.3). Interms of total area cultivated however, maize is the second important cereal next to *teff* (CSA, 2008). For instance during 2008 harvesting period, the total area covered by cereal production was nearly 8.7 million hectare out of which teff was cultivated over 2.6 millions of hectare followed by maize (1.8), sorghum (1.5) and wheat (1.4) millions of hectare.

Maize is an important food staple in Ethiopia especially in Southern part, rural people and urban poor people while it faces low demand as food staple among the people in the north and well-off urban population. Thus, given the importance maize, developing a well functioning market for this commodity can make significant difference in the welfare of most rural poor, as maize cultivation is predominantly a smallholder practice in Ethiopia.

3.4 MAIZE MARKETING IN ETHIOPIA

Empirical evidences on grain marketing reveal that very small proportion of food grains production is marketed. For instance, as Gabremeskel (1998) indicated, out of the total food grain production, only 28% was marketed in 1995/96 cropping year (annex B). Out of this marketed food grains, cereals accounted only to 26%. In the same year, out of the total maize production (22 million quintals), only 25% was marketed. The larger portion of the produce went for direct household consumption due to the subsistence nature of the production (Amha, 2001:61). According to a recent record by Ethiopian Commodity Exchange (Ecx, undated), out of the total maize production at the national level, 76.03% was used for household consumption, 10.22% for market, while the remaining was utilized for seed, wage in kind, animal feed and others.

As mentioned earlier (annex B), among cereals maize had the highest share of total marketed surplus (25%), followed by teff (21%), and wheat (14%). Similarly a study by RATES (2003:14) notes that among cereals, maize constitutes nearly 28.2% of the total marketed share which was the highest. As a way of comparing the demand for maize in rural and urban areas, the study found that the demand in the urban area was small (5.2%) as compared to the rural areas that accounted for 23%. The main cereals with higher demand in the urban areas are teff and wheat. An attempt to raise the urban demand through increasing the quality of maize would be of paramount importance to improve the gains from the chain relation for small producers who are located at the bottom of the chain.

- Various studies report on the nature and structure of cereal marketing channels in Ethiopia (Mandefro, et al, 2001; Eleni, 2001; Amha, 2002; Girma, 2002; RATES, 2003). They all distinguish more or less the same intermediaries involved in organizing the flows of cereal from the farmers to the consumers, which can also be extended to the case of maize marketing. These intermediaries include: assemblers/rural collectors, wholesalers, retailers, and brokers. Together with maize primary producers these intermediaries form the maize marketing channels in Ethiopia. This means farmers can directly sale to: rural and urban (poor) consumers; rural assemblers/farmer- traders; inter-regional traders/wholesalers and retailers.

Participants (e.g. farmers and intermediaries) along the maize/cereal marketing channels assume different tasks and can be describe as follow.

Primary Maize Producers: - As indicated earlier, a small- scale subsistence farmer undertakes the larger proportion of maize production. They put aside most of their produce for consumption and marketed the remaining small portion. According to Gabremeskel, et al, (1998:8); Girma Bekele (2002) farmers can sell their grain [such as maize] directly to: consumers (both rural and urban), rural assemblers or farmer-traders, retailers, and wholesalers. Due to the prevailing high transaction costs, (Eleni and Ian, 2005:3; RATES, 2003:14) farmers sale their produce (either carrying sacks themselves or using donkey) across short distances (within 20 km distance) from the main regional markets. This paper intends to identify and estimate such transaction costs associated with the farmers' decision of marketing channel choice.

Rural Assemblers/Local collectors: - They are also known as "farmer-traders" and they purchase maize in the village or farm gate to sell it later. Eleni, (2001:14) described them as "large-scale farmers who assemble grains from a large number of farmers and transport it to the regional markets using horse-driven carts". They also use pack animals and small trucks and sale maize in the secondary or urban markets (RATES, 2003:16). According to a study by RATES (2003), the rural assemblers play an important role in collecting maize surpluses from small holder farmers, constituting 40% of producers' total sells followed by wholesalers (35%). The study also indicates that the rural assemblers handle nearly 37.5% of the total maize marketed.

Private Wholesalers. Following market liberalization in Ethiopia in the 1990s, the dominant role of the state in wholesale cereal trading (through the Agricultural Marketing Corporation (AMC)) was abolished. Before the reform, regional wholesalers were required to sale their purchases to AMC at a fixed price. With the reform, AMC was renamed as EGTE (Ethiopian Grain Trade Enterprise) in 1999 (RATES, 2003). The reform encourages private wholesalers to involve in grain marketing. In general, in Ethiopian cereal marketing five types of wholesalers are identified: wholesalers in surplus areas, wholesalers in major terminal markets, wholesalers in deficit areas, private companies that perform various business activities, and EGTE. In the case of maize, these wholesalers as a whole manage around 74% of the total marketed quantity. Most of

the wholesalers in the surplus areas are licensed grain traders who receive grains from smallholder farmers, rural assemblers and sale grains to the different market outlets including Addis Ababa (the central market), retailers, and consumers.

Retailers: - Retailers deliver the grains to the final consumers. Although license in required to enter to the business, most of the retailers are unlicensed[6] where they cover 38% of the marketed volume of maize (RATES, 2003:21).

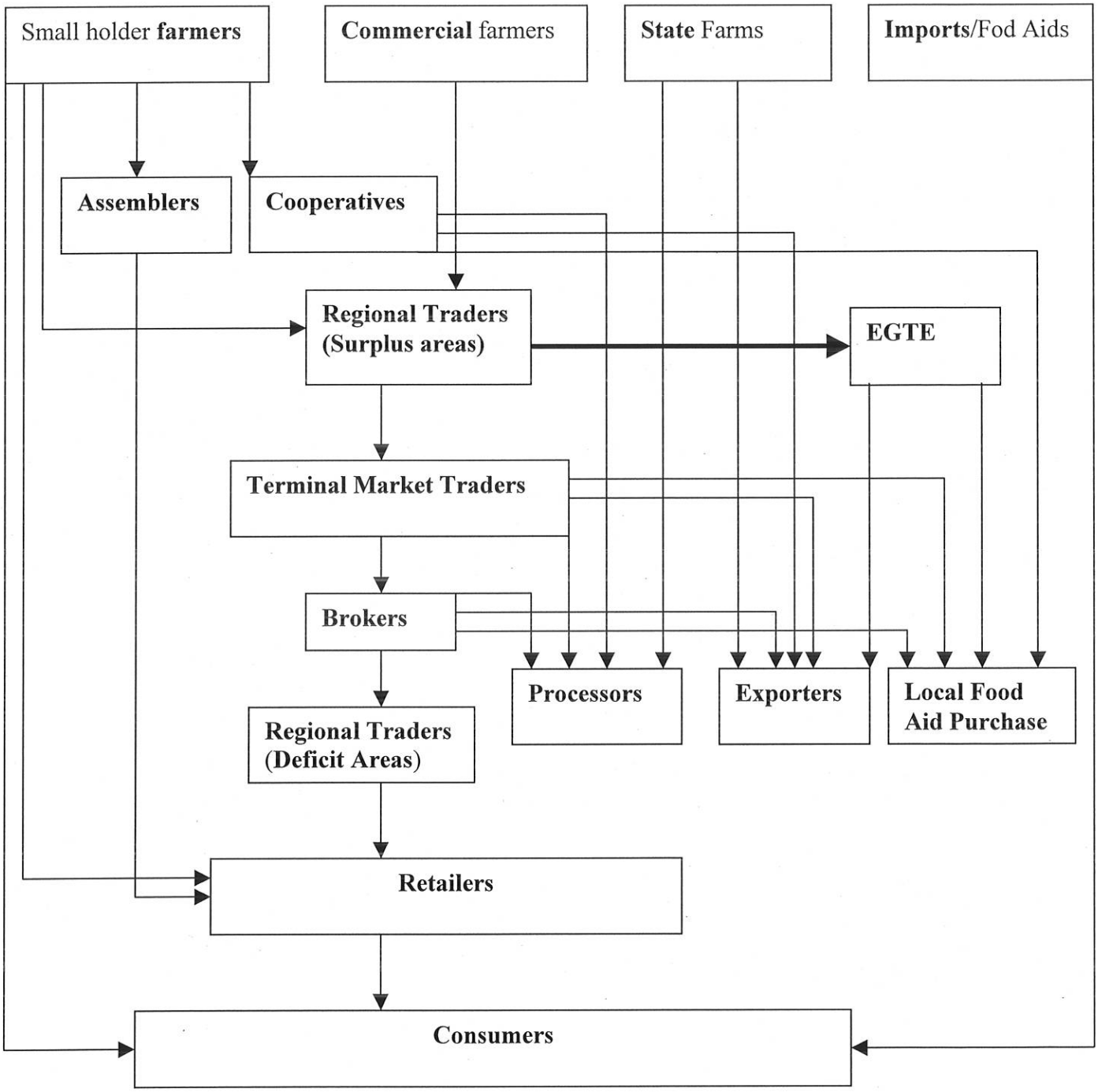
Grain Brokers: - An important feature of the Ethiopian grain marketing is the use of brokers by wholesalers and retailers. Brokers dominantly located in the central markets (Addis Ababa), coordinate inter-market grain flow. They provide information on market price of the day to traders. According to Eleni, (2001), Grain brokers:

> *acknowledged receipts of the grain from regional wholesalers, inspect its quality, determine its market clearing price, and proceed to sell it on behalf of their clients.*

The following figure depicts the evolving maize marketing channel structure in 2005.

[6] Amha (2002:69) note that there were also many unlicensed grain traders in various markets. For instance, in the market of Maki town out of 45 grain traders, only 15 were licensed. In Shoa-Robit, out of 20 grain traders only 5 were licensed. In Addis Ababa *Ihel Berenda*, there were about 1,000 unlicensed grain traders. From the perspective of licensed grain traders, the presence of large number unlicensed traders was considered as a constraint.

Fig. 3.3 An Evolving Grain Market Structure in Ethiopia, 2005



Source: Eleni and Ian, 2005:15

3.5 MAIZE PROCESSING

Studies show that maize is the least processed among cereals. Most of the processing is undertaken using traditional means. According to Dereje and Abdissa (2001), the following three forms of grain/cereal grindings are identified in Ethiopia. These are: hand grinding using two stones of different sizes, hand pounding using wooden pestle and mortar, and flour mill. The first two are traditional milling methods, which are still popular in rural areas where maize is the traditional staple. These traditional milling involves manual methods and are carried out at the homestead by women. These methods are labor intensive and hence a burden for rural women but they require small finance. A study by RATES (2003) found that there are around 31 large and medium scale flour mills in Ethiopia where most of them are located in the major urban areas and require high cost of establishment. The study reveals that almost all of them, except one or two, mill wheat. For instance in 2001/02, out of the total capacity of 168,000 metric tones, 71% was accounted to wheat flour, 18% pasta/macaroni, 3% maize, and 2% bread. The prevailing thin market (low demand for maize in the urban areas) related to the low milling capacity of maize. This discourages processors to involve in large scale maize processing. Diversifying maize products (to address consumer preferences) by processing maize flour to be further used in making other food products and using maize as an animal feed may be helping to expand markets for maize (Eleni and Goggin, 2005).

3.6 TRANSACTION COST AND MAIZE/CEREAL MARKETING IN ETHIOPIA

Broadly speaking, transaction costs can be defined as costs that include the costs of gathering and processing the information needed to carry out a transaction, of reaching decisions, of negotiating contracts, and of policing and enforcing those contracts (Williamson, 1985). A study by Janvry et al (1995) identified transportation costs to and from the market as important part of transaction costs. Presumably this is because smallholder agriculture generally is dispersed over wide areas, and infrastructure connecting farms with markets often is poor. This entails high costs in relation to search for means of transportation. This makes market distance and the types of transport as vital determinants of transaction costs in agricultural marketing of many Sub-Saharan African countries.

Studies (Kahknon and Lethers, 1999; RATES, 2003; Collinson, et al, 2002) on Sub-Saharan African agricultural markets have identified the following as major sources of transaction costs. These include: small-scale farmers are located in remote areas far away from service providers and major consumer of farm products (i.e. distant from market); poor and inadequate infrastructure; and poor access to assets and information.

Numerous case studies show that many rural households fail to participate in certain agricultural markets in developing countries due to the prevalence of high transaction costs. As (Shiferaw et al, 2006) states, many Sub-Saharan African countries have liberated markets with the intention of enhancing market efficiency and improving market linkages for small farmers. The reform, among other things, emphasis on 'lifting trade barriers and increased the competition which has opened some flexibility for small farmers to choose buyers for their products and suppliers of key inputs' (Shiferaw et al, 2006). However, the fruit of this reform proved to be disappointing due to the fact that the functioning of the markets is impeded by high transaction costs and coordination problems along the production- to- consumer value chain[7]. He notes that development of markets in such areas is highly influenced by 'lack of access to markets infrastructure, and geographical isolation either due to remoteness or poor roads and poor communication systems' which in turn severely affects small holder farmers (who are at the bottom of the value chain). In general, in such areas agricultural marketing is characterized by thin local market, less competition, and seasonal volatility of price.

Empirical evidences on Ethiopian grain market have documented that the above constraints are very significant. The studies by (Amaha, 2001; Dereje and Abdissa, 2001; Eleni and Goggan, 2005; Dender, 2002) have revealed that grain (cereal such as maize) marketing in Ethiopia is not functioning well due to the prevailing high transaction costs. These costs include:

i) ***lack of market information***. For instance, Dereje and Abdissa (2001) argue that small farmers don't get timely market information which result in weak bargaining power on prices and other marketing aspects. They found that small farmers happen to know current market price only up on their arrival to the market place. This affects the final

[7] A Value Chain can be defined as a process by which "a product from its starting point (with the producer) to its end point (with the consumer), emphasizing the fact that products undergo a series of value-adding processes before reaching the consumer, making the end product more valuable" (Rebecca Dunsmuir el at, 2007: 4). However, discussion on value chain analysis is beyond the scope of this paper.

price they should deserve and creates a room for farmers' exploitation by the middle men.

ii) ***poor transportation facilities***. Smallholder farmers, as Dereje and Abdissa (2001) note, fail to participate in 'distance markets where there are price advantages' due to high transportation costs. It is indicated that Ethiopia has the lowest road density in Africa. Similarly, Eleni and Goggin (2001) reveal a situation where market participants [such as small farmers] conduct business transaction 'across short distances, with few partners, in few markets, and limited storage.' A study by Dender (2002:95), on maize price formation in Shashemene regional markets has found that transportation costs alone accounted about 60% of the total marketing costs. He notes that this high transport cost hinder primary producers to claim the fair share from the final price they received. He found that the final price paid to the producers was lower than wholesale and retail prices. The wholesale and retail prices were higher than producers price by 6.5% and 14.1% respectively (see annex D).

iii) ***lack of sufficient market coordination*** among market actors (farmers, traders, dealers, transporters, and processors).

iv) ***lack of trust*** among market participants.

v) ***lack of grade and standards***. This is particularly important to maize marketing and processing to raise local demand for maize in the urban markets.

In short, the above empirical evidences show that developing market by reducing major constraints is of paramount significance especially for Ethiopia where a large portion of the population is market dependent (Amha, 2002). This paper argues that small farmers in maize marketing don't get access to the relatively lucrative marketing channel presumably because of the existing high transaction costs. Thus, for small holder farmers who are the dominant primary providers of maize produce to be able to participate in the main stream market where prices are higher, transaction costs incurred within the marketing channels should be identified and minimized.

CHAPTER FOUR: DATA SOURCES AND RESEARCH METHODOLOGY

This chapter focuses on reviewing the research method employed in the study. The discussion is intended to show how this study is conducted employing the specific research tools which include, the survey instruments, data collection procedures, descriptive statistics as well as the empirical model applied for data processing. The chapter also tries to provide justification for model selection.

4.1 DATA SOURCES

Both primary and secondary sources of data were used to assess the maize marketing channel and farmer's market channel choice decision under transaction cost approach. Before the field visit, numerous relevant secondary sources were reviewed. These sources include articles, reports, proceedings, journals, and various Internet sources. The primary sources constitute field visits/observation with the intention of better understanding farmers' negotiation and other marketing behaviors in rural areas and transport problems on the road. Primary data was collected by surveying the marketing channels for maize from the farm gate to the consumer. The study also entailed focus group discussion with farmers and key informant interviews with major chain actors to identify and understand the maize marketing channels.

This study was based on primary data collected from maize farmers in the rural kebele of Bura Borama, which is one of the 19 lowland kebeles' that have high potential for maize production in the districts of Shashemene. Shashemene is one of the rural woredas' in West Arsi zone of the Oromia Region, 250 km from Addis Ababa. The entry point in this study is maize farmers in Bura Borama kebele found within Shashemene woreda. Using primary maize producers as an entry point, the paper tries to identify linkages and major chain participants from the farm gate to the final consumers. These actors include input suppliers (variety of maize seeds, farm implements), maize farmers (subsistent and commercial), distributors (traders), and processors (local drink brewers, *areqe* and *tella).* The districts of Shashemen, which is one of the major maize surplus area in the country (Dendir, 2002; RATES, 2003; Eleni, 2001), hosts 19 rural

kebeles that are mainly engaged in maize production and Bura Borama is one of such lowland rural kebles. It is selected for this study at least for the following reasons:

1. ***Volume of maize production***- Bura Borama is inhabited by subsistence farmers who predominantly cultivate maize as their staple food.
2. Bura Borama is also a major supplier of maize to the Arada market (*ehil berenda*), in the town of Shashemene and a policy priority under PASDEP and selected for the analysis of commodity exchange. And it is the interest of this paper to identify the main supplier of maize to this market.
3. ***Accessibility***- Rural communities in Bura Borama kebele reside on both sides of the major highway that link Shashemene with the major town of Southern Ethiopia. This created easy access to undertake the survey as compared to other distant lowland areas in the district.
4. More importantly, pertaining to transportation problem, previous studies (RATES, 2003; Eleni, 2001) indicate that it is hardly possible for producers to reach the main regional markets (such as Arada) beyond 20kms radius. Thus, being situated within 20 kms from Arada market, Bura Borama turned out to be ideal for this study in order to assess whether maize farmers participate in the main stream *Arada* grain market or not.

Description of the Study Area

Bura Borama is located some 12kms south of the town of Shashemene along the major highway to Wolayita, and ArbaMinchi. It is one of the 19 rural lowland (*kolla*) kebele' and situated over 2400 hectares of land. Of this area of land around 1235 ha is allotted for crops cultivation such as maize, teff, sorghum, dagusa. Out of 1235 ha, 872 ha is allotted for maize production, which is the major, food stable in the area. Around 845 households reside in the rural kebele of Bura Borama.

The economy of the area largely depends on agriculture, which is highly rain-fed and dependent on draught plow. Despite the presence of few commercial farmers who produce mostly for market, the majority of farmers are small-scale or subsistence cultivating maize mainly for own consumption.

Rural communities in Bura Borama highly rely on maize for their livelihood. Maize is used to prepare the local food (*kita and injera*), the local alcohol drinks (*areqe and tella*), as well as in feeding animals.

Sampling Techniques and Size

The survey targeted those farmers who traded maize in 2006/07 cropping year as the study intended to investigate the marketing channel choice decision of farmers. The year was considered as normal year in the study area. However, a list of maize farmers who involved in maize exchange in the specified year was not available. As a result, the sample is not random rather the respondents were selected through a non-probability sampling methods (i.e. purposive sampling). Sampling units were selected through convenience and judgment of the interviewers in collaboration with the Development Agent (DA) and extension officer. Most of the respondents were household heads. Households were visited house-to-house, farm-to-farm and market points. The sample size was 110 but the observation was reduced to 103 due to missing values.

Purposive sampling was also employed to select a key informant from participants in the maize marketing channels (assembler, wholesaler, retailer, processor (*areqe/tella*)). Further more, a focus-group discussion was conducted with maize farmers to compliment on the information obtained from the survey. Such information was used to depict the marketing channel in the study area.

Methods of Data Collection

A questionnaire was designed to capture and identify factors (such as household structure, age, education level, farming experiences, marketing trends, and the various types of transaction costs) that influence farmers' decision of marketing channel choice. The questionnaire consisted of both open-ended and close-ended questions to capture the respondent's own opinion or understanding of issues mentioned. There are different ways in which a questionnaire may be administered; self-administered questionnaire, face-to-face interview and telephone survey. Face-to-face interviews were considered relevant method for data collection in this study. Enumerators

who have previous experiences in similar survey and fluent in the local language (Oromogna) were employed for data collection. The main reason to use such enumerators was mostly to minimize the problem related to potential language barrier with respondents as they are Oromogna speaker, not to mention the fact that Oromigna is the working language in the study area. Moreover, they can also accommodate interviewees who can neither read nor listen other languages other than Oromigna. The enumerators had also good understanding of Amharic and English languages.

Other survey methods were also used to complement information collected through questionnaires. A check list was designed to collect information from farmers' focus-group discussion as well as in-depth interview with participants of the maize marketing chains/channels such as different intermediaries (e.g. rural/farmer collector, wholesaler, retailer), local drink processor and input supplier. In collaboration with the extension worker, six farmers were selected for focus-group discussion (refer annex Fa). For the indepth-interview, one key informant from each market participants was also contacted (see annex Fb). It is important to note that the information obtained from the participants in farmers' focus-group discussion as well as indepth-interview was meant to supplement the information collected from the survey. In addition to field observation, discussion with extension officers and local Development Agent (DA) was undertaken. During such activities the local DA accompanied the author and presented in some of the interview. However, the presence of the DA didn't affect the openness of the key informants and focus-group discussion participants and their information can be considered reliable.

Issues addressed both in the questionnaire and the checklist include the following: demographic details, types of maize seed cultivated, maize marketing conditions, marketing channels, transaction costs, storage and processing arrangements, and major constraints in maize marketing and processing. Farmers were asked to report their most preferred marketing channel where they used to sell the largest volume of their maize during 2006/07. With this the assumption of discrete choice can be maintained.

4.2 RESEARCH METHODOLOGY

The analysis seeks to identify transaction costs factors and farmer characteristics that affect the household's decision of market out let choice. Not all farmers choose the same marketing channels as transaction costs are household specific. This paper adopted a multinomial logit model to evaluate that determines the major factors that influence the behavior of marketing channel choice among maize farmers in Bura *kebele* of Shashemene district.

For decisions related to channel choice, common practice is applying a binary or multinomial logit model, depending on the number of marketing channels involved, (Lu, 2007). These qualitative choice models calculate the probability that a decision maker (in this case a maize farmer) will choose a particular alternative maize market channel from the set of choices. When the choice set consists of only two options, binary or probit models are the most frequently used econometric models for an empirical analysis. However, if the choice sets are more than two, then the multinomial logit discrete choice model is used (Green, 2000). Green also notes that logit model is appropriate for data, which are individual (household) specific. According to Boger (2001), the multinomial logit model links transactions' characteristics with the market channels in which they occur. Another study by Park and Lohr (2006) applied the multinomial logit model to investigate the marketing channels employed by organic producers. The authors reported that the multinomial logit (MNL) and the maximum likelihood procedures provided a framework that supports the use of discrete models for dealing with selectivity effects and for estimating its parameters. Medina and Ward (1999) also used multinomial logit model to explain the marketing outlets used by beef buyers. They indicated that since the outlet choices represented alternatives without order or ranking the use of the use of multinomial logit model was appropriate to explain the outlet selection mobility. Previous studies (Eleni, 2001; RATES, 2003) have distinguished four different types of marketing channels in grain marketing thus include direct sell to consumers, sell to rural collectors, sell to wholesalers and retailers. But, after receiving questionnaires, only three (excluding retail markets) marketing channels were identified which differ in the costs of using them. Thus, for the purpose of this study where maize farmers face three different marketing channel choices, multinomial logit model can be used.

Statistical software is used to analyze the data obtained from the survey. SPSS version 16 was used to discuss the descriptive results of the study. The empirical estimation was done using STATA 10.

Empirical Model Estimation

Supposing that each one of the individuals of the sample chooses only one type of market, the decision of choosing the market is discreet. Consequently, the model chosen for explaining the choice is a discreet one, so the estimation is made using the econometrics of discrete regression and qualitative choice models. In this regard, standard maximum-likelihood estimation was used to determine the impact of explanatory variables on producers' choice of market channel *(dependent variable)*. For the qualitative dependent variables, where the decision maker (maize farmer) must choose between three or more mutually exclusive and unranked alternatives (marketing channels), the multinomial logit model was considered the most appropriate (Pindyck and Rubinfeld, 2001);

In this respect, review of the literature on agricultural marketing practice in developing countries shows that producers'face different marketing channels when decided to sell. For example, recent studies such as Gastão Lukangu (2005) on Mozambique; Ferto and Szabo (2002) on Hungary; Lu (2007) on China; Mathye et al (2001) on South Africa; Eleni (2001) on Ethiopia; RATES (2003) on Ethiopia and Kenya, have indicated that farmer households encounter different choices of marketing channels such as wholesalers, retailers, assemblers, cooperatives etc to sell their products. In consideration of this assumption and the particular contexts of the study areas, sample households were asked to report their most preferred marketing channel used. As a result, three categories of survey respondents, namely those who directly sold to consumers (j = 1) wholesalers (j = 2) and collectors (j = 3) were distinguished.

A polychotomous response model (Greene 2000) was applied to explain inter- household variation in the choice of a specific marketing channel. As noted earlier, it is assumed that each alternative marketing outlet choice entails different private costs and benefits, and hence different utility, to a household decision maker. This study assumes that farm's decision is generated based on its utility maximization. The analytical model is constructed as follow. Suppose that the utility to a household of alternative j is U_{ij}, where j = 0, 1, 2,..., J. From the decision maker's

perspective, the best alternative is simply the one that maximizes net private benefit at the margin. In other words, household I will choose marketing channel *j* if and only if $U_{ij} > U_{ik}$, $\square k \neq j$. It is important to that a house hold's utility cannot be observed in practice and what a researcher can observe is the factors influencing the household's utility such as household and personal characteristics and attributes of the choice set experienced by the household (Deginet, 2008). Based on McFadden (1978), a household's utility function from using alternative *j* can then be expressed as follows:

U (choice of *j* for household *i*) = $U_{ij} = V_{ij} + \varepsilon_{ij}$ (3)

Where, U_{ij} is the overall utility, V_{ij} is an indirect utility function and ε_{ij} is a random error term.

The probability that household i selects alternative j can be specified as:

Pij = Pr (Vij + ε_{ij} > Vik + ε_{ik}) (4)

= Pr($\varepsilon_{ik} < \varepsilon_{ij}$ + Vij – Vik, $\forall k \neq j$)

Assuming that the error terms are identically and independently distributed with type I extreme value distribution, the probability that a household chooses alternative j can be explained by a multinomial model (Greene, 2000) as follow:

$$P_{ij} = \frac{exp\,(\beta_j x_i)}{\sum_{j=0}^{J} \exp(B_j x_i)} \quad (5)$$

where χ_{ij} is a vector of household of the ith respondent facing alternative *j* and β_j is a vector of regression parameter estimates associated with alternative j.

Following equation (5) above, we can adapt the MNLM fitting to this study as follow:

$$P(CHOICE_{ji}=j) = \frac{\exp\,(B'_{j'xi})}{\sum_{j=1}^{3} \exp(B'_j x_i)}$$

Where

i represents *i-th* farm household, and *i*= 1, 2,...., 103;

j represents different marketing channels, j=1 for direct sales to consumers at wet markets (DIRE), *j* =2 for sales at the farm gate to assemblers (TRAD), and *j* =3 for sales to wholesalers (WHOL) at the whole sale market.

P represents the probability of a maize marketing channel J to be chosen by farm household i;

$CHOICE_{ji} = j$ means that maize marketing channel *j* is chosen by farm household *i*;

$\chi_i = (AGE_i, EDUC_i, CART\_OWN_i, KNOW_i, DELAY_i, SPENT_i, COORDTRP_i)$

It is a common practice in econometric specification of the MNLM to normalize equation (5) by one of the response categories such that $\beta_j = 0$, Deginet (2008). In this regard, the MNLM can alternatively be specified as follow:

$$P_{ij} = \frac{exp\,(\beta_j x_i)}{1 + \sum_{j=1}^{J-1} \exp(\beta_j x_i)} \qquad (6)$$

The coefficients of explanatory variables on the omitted or base category are assumed to be zero. The probability that a base category will be chosen can be calculated as follow:

$$P_{ij} = \frac{1}{1 + \sum_{j=1}^{J-1} \exp(\beta_j x_i)} \qquad (7)$$

For better understanding the values attached to the coefficients, it is recommended to compute the marginal effects, Green (2000:859). The marginal effects of the attributes on probability of choice are determined by differentiated equation 5:

$$\delta j = \partial Pj/\partial xi = Pj = Pj \left[Bj - \sum_{j=0}^{J} (Pj)(\beta j) \right] \quad \text{for } j = 1, 2, \ldots J \qquad (8)$$

where:

Pj is the probability for farmers choose market channel j.

β□ is a vector of regression parameter estimates associated with alternative □.

In our case, farmers have three channels to sell maize, J = 3, and the alternatives j = 1,2,3, represent sale in the outlet, directly to consumers at the wet market, to wholesalers and to assemblers respectively.

The model predicts the relative probability that a producer would choose one of the four categories based on the transaction characteristic. For this analysis, the marketing channel wholesaler (WHOL) was used as comparison base because this marketing channel was chosen by the majority of maize farmers in trading their maize. The marginal effects were calculated using the STATA command- mfx- for the three categories.

The Assumption of Independence from Irrelevant Alternatives (IIA)

An important property of multinomial logit models is Independence from Irrelevant Alternatives (IIA); that is, the ratio of the choice probabilities for any two alternatives for a particular observation is not influenced systematically by any other alternatives. IIA can be tested by fitting a model that contains all the cross-alternative effects and examining the significance of these effects. IIA may become a problem when some of the alternatives in the choice set are seen as substitutes for each other (Dow and Endersby, 2004). They suggest that multinomial model selection should primarily be guided by theoretical motivation and, therefore, selecting one model over another based on IIA criteria is rarely relevant. The Hausman specification test was applied to check that the IIA assumption was not violated. The null hypothesis of this test is that the odds P(outcome- marketing channel choice) vs P(outcome-reference) are independent of other alternatives. According to Fader et al (1996), it is possible to restrict oneself to a single restricted choice set. In line with this, restricting DIRE marketing channel a Hausman test for TRAD vs Whol (base category) reveal a value of chi2 = 5.38 and p > chi2 = 0.9935. Since the p > chi2 value is greater than the confidence interval (0.10) the null hypothesis is not rejected. Thus there is evidence that the IIA assumption is not violated.

Testing for homoscedasticity

This problem of heteroscedasticity is always common and expected when analyzing cross-sectional data. If the variance of the residuals is non-constant then the residual variance is said to be "heteroscedastic." In this paper we use whitest to test for heteroscedasticity. The null hypothesis would be that the variance of the residuals is homoscedastic. Therefore, if the p-value is very small, we would have to reject the hypothesis and accept the alternative hypothesis that the variance is not homoscedastic. The command *robust* in (Stata version 10) is used to correct for heteroscedasticity.

Testing for Multicollinearity

Multicollinearity is not a statistical or econometric problem, but a data problem that violates one of the assumptions of the Classical Linear Regression (CLR) model, which specifies that there must not be an exact linear relationship between independent variables (Kennedy, 1998). The primary concern is that as the degree of multicollinearity increases, the regression model estimates of the coefficients become unstable and the standard errors for the coefficients can be inflated. Multicollinearity can be detected by by examining the correlation matrix or by calculating the inverse of the correlation matrix (Kennedy, 1998). According to the author, collinearity is believed to be harmful when the correlation coefficients have values of 0.8 or greater and VIFi is greater than 10.

Table 4.1 Hypothesized transaction costs and household characteristics expected to influence maize farmers' decision of marketing channel choice.

Independent Variables	Description	Expected sign (+/-)*	
		DIRE	TRAD
AGE	Household Age (years)	+/—	+/—
EDUC	Level of household head education.	+	—
FAMSIZE	Household size (numbers)	+/—	+/—
TFARMSZ	Household farm size (ha)	+	—
KNOW	Dummy scoring 1 if a farmer go to market to learn price, 0 otherwise.	+	—
SPENT	Total hours spent to reach to market (hrs)	—	—
DELAY	Dummy scoring 1 if there is payment delay, 0 otherwise.	—	—
OWN_CART	Dummy scoring 1 if a farmer owns animal cart, 0 otherwise.	+	—
COORDTRP	A problem when a farmer coordinates with other Producers to transport. 1= always; 2= sometimes 3= never, 4= others___	—	+
MDIS	Distance to the market in kms	—	+

* These outlets are compared to the base category (CHOICE= WHOL)

Note: A positive sign implies that a unit increases in the independent variable lead to an increase in the probability of selling to a given channel. On the other hand, a negative sign means that a unit increases in the independent variable leads to a decrease in the probability of selling to that market outlet.

The dependent variables (the marketing channels (CHOICE) chosen) in the analysis is measured by the probability of selling maize to either of these markets. According to the survey result, three different marketing channels were identified. These include; direct sales to consumers at the wet market (1= DIRE); sales at the farm gate (2= FARMG) to rural collectors and sales at the wholesale market (3= WHOL). Some households may favor one outlet while others may not be using the same outlet due to market conditions that feature in high transaction costs.

To determine factors affecting these dependent variables a number of independent variables hypothesized to reflect the existence of different forms of transaction costs are considered in the estimation model. These independent variables are organized in to – information costs, negotiation costs (such as transportation costs), monitoring costs, as well as household characteristics. The variables most commonly used to capture the socio-economic conditions of the household are age, education, household size, farm land holding, off-farm income and access to modern maize seeds. The model included the following independent variables of the aforementioned categories (refer Table 4.2).

4.2 Descriptive Statistics of explanatory variables used in the model

Variables	Obs	Mean	Std.Dev.	Min	Max
AGE	103	36.73786	12.30332	26	75
EDUCH	103	2.466019	.8496312	1	3
FAMSIZE	103	7.951456	3.807574	2	22
TFARSZ	103	1.897282	1.186652	0.25	6
OWN_CART	103	.3883495	.489758	0	1
KNOW	103	.2718447	.4470859	0	1
DELAY	103	.1359223	.3443819	0	1
SPENT	103	2.372816	1.309108	1	8
COORDTR	103	1.174757	.3816164	1	3

Source: Field survey, July-August 2008.

The set of relevant independent variables were identified taking in to account economic theory, previous studies as well as the nature of the study area.

Access to Market Price Information (KNOW): it is assumed that maize farmers try to first determine the price that they expect to receive before making a decision about how to market a product and to whom to sell it. Smallholder farmers would only be able to influence their buyers

if they had information about prices, products, marketing opportunities and trends. Knowledge was power while technical and marketing information was a productive element of human capital in farming (Delgado, 1999). As Gastao (2005) cited Masuku (2001) access to (production and marketing) information measured as opportunity for radio listening and newspaper reading differentiated farmers selling more agricultural produce from those selling less. According to Gastao (2005) better decisions in a risky or uncertain world such as agricultural cultivation and marketing could easily be made if information that reduced uncertainty was available. He also noted that the cost of information was higher in regions with poor communication channels such as lack of radio, telephone, fax, internet and postal services, written channels and transportation. In our case, due to poor communication channels mentioned above farmers highly relied on traders and friends for market information and hence access to useful and relevant information was very limited. Households with high literacy levels, better access to management and technical advice, and better knowledge of market opportunities would probably grow their operations more easily than those without (Delgado, 1999). The more information a farmer has on the marketing channel, the less would the transaction costs be. Put differently, the less costs associated with the outlet increases the probability of using that market channel. The variable (KNOW) was included in the model in order to assess farmer's ability to acquire information on market price from reliable sources, and the variable was measured by asking them how easy it is for them to know information about what price the market channel offered before selling their maize. It is important to note, however, that access to price information is also related to average education of the respondents and proximity to the market. Education improves farmer's ability to obtain, analysis, and interpret information.

Efforts to Coordinate Means of Transportation (COORDTRP): farmer's access to the mainstream market (in this case Arada grain market at the town of Shashemene) may be hampered due to bad road network linking farmer's homestead to the market together with absence of coordination effort to arrange transportation. Among other things, good transport coordination effort by producers is vital to transport products to the market with relatively lower costs. In this study transportation cost is turned out to be a major problem and a variable (COORDTRP) is used as a proxy to estimate the costs of transportation. It is assumed, in addition to increasing distance from the market, that transportation costs increases when the road

condition and ability to coordinate means of transportation is poor. It is noted a problem when individual farmer himself/herself organizes means of transportation because it increases searching costs and direct transport cost while such costs are expected to be lesser when a farmer coordinates transport with other farmers. Thus, it is hypothesized that coordination problem negatively related to farmers' decision to move to market and positively related to the decision to sale to rural collectors.

Ownership of Transport and Distance from the Market Place: given transportation cost is a major problem in many rural markets, possessing means of transportation (e.g cart, bicycle, truck etc) is expected to positively influence the probability of farmers' participation in the mainstream market. The reason is that households that owned these physical assets had lower transportation, communication and information costs and subsequently fewer obstacles to entering the market (Matungul, 2002). In this study farmers were asked whether they had owned means of transportation (i.e. animal cart) and the variable OWN_CART was included in the estimation model to test such relationship in the study area. A farmer who has no access to transport infrastructure would indicate that buyers should come to the farm. Distance from the market negatively influences farmers' decision to directly participate in the market. For instance Gastao (2005) indicated that farmers near markets and on main roads could justify taking their products directly to markets because of reduced transportation costs and reduced time taken to carry the products to the market. Farmers were asked to indicate the distance from their homestead/farm to the market and the variable MDIS was used to empirically test the result.

Payment Delay (DELAY): monitoring costs are not expected to be a serious problem for maize farmers while selling their product because payment is made in cash immediately upon sales. The only monitoring cost that may accrue to farmers could be related to payment delay presumably due to maize quality. The quality of maize can be affected by poor storage facility and poor threshing system. Speed of payment upon transaction can encourage farmers to choose this particular marketing out let. The variable DELAY was included and farmers were asked to indicate whether there was a payment delay upon transaction. It is hypothesized that payment delay is negatively related to the probability of participation at the wet market while it is positively related to decision to sale at the farm gate.

Total Time Spent to Reach the Market (SPENT): the longer the time to reach the mainstream market the lesser will be the probability of this market out let to be chosen by producers as it implies high transaction costs. In this study farmers were asked to indicate the total time (hrs) they required to reach to the mainstream grain market to sale their product. The variable SPENT was used in the model.

The existence of transaction costs in agricultural marketing is also attributed to certain specific household characteristics that influence farmer's decision of marketing channel choice. These variables in this category include the following.

Age of the Household head (AGE): age is measured as a continuous variable and measured in years. The age of producers was obtained by simply asking them their present age. The variable AGE was used in the estimation model in order to understand how age affects the decision of market out let choices. Different studies showed that the effect of age on market participation tend to be ambiguous, as it could positively or negatively influence the decision to participate in agricultural marketing. According to Polson and Spencer (1999) it was found that attributed to their longer planning horizons younger farmers were greater risk taker and more inclined to search for information compared to their older counter parts. Christopher (2002) observed that older producers more likely be involved in production contracts while older producers more likely be involved in independent and cooperative arrangements. Similarly Ferto and Szabo (2002), and Musemwa et al (2007) found that older farmers preferred a stable business arrangements provided by marketing cooperatives and producer organization to riskier connections with traders. On the contrary however, Goetz (1991) identified that older farmers were more likely to participate in markets of cash crop than younger farmers due to the effects of age on experience about trading opportunities.

Level of Household Head Education (EDUCH): education enhances the ability of the household to make appropriate decisions by enabling them to think critically and use information sources efficiently. It is expected that farmers with more education could be aware of more sources of information and more efficient in evaluating and interpreting information related to price as well as other marketing issues. The variable EDUCH was used to measure effect of household's education level in marketing channel choice decision.

Farm Land Owned (TFARMSZ): total farm size refers to the total area of land employed for maize cultivation measured in hectare (ha). The relationship between the size of the field and market participation has to do with increased household production for consumption and for sale Gastão (2005). Larger farm ownership can offer farmers wider opportunities to think more diversified strategies that can move them beyond subsistence farming than smaller land holding. Total herd size has a direct influence on the participation of small-scale cattle farmers in the mainstream cattle markets.

Household Size (FAMSIZE): household size could influence market participation through its effect on labour in the area of cultivated land and on the volume of production that could be consumed and sold. However, a study by Goetz (1992) cited by Gastao (2005) found that a larger household size also meant that more food was needed to feed and the larger the consumption requirement meant the less a household could sell. Thus, household size may positively or negatively influence farmers' decision to choose a particular marketing outlet.

CHAPTER FIVE: RESULTS OF THE DESCRIPTIVE STATSTICS

This chapter provides an overview of maize marketing channels in Bura Borama Kebele. The chapter starts by discussion on the characteristics of the sampled households. This discussion is followed by assessment of the types of maize seed farmers cultivated, farmer's access to market price information and other inputs. The chapter also highlights some of the constraints of maize marketing and processing in the study area.

5.1 SOCIO-ECONOMIC CHARACTERITICS OF RESPONDENTS

Data were collected from 103 maize farmers, which were stratified in to subsistence (non-commercial) and commercial farmers. This stratum in sampling design was made because they differ with respect to maize marketing activities. Put differently, traditional farmers are described as farmers who lack market orientation in their production and provide less 50 % of their produce to the market. Commercial farmers, however, engage in maize cultivation largely (more than 50% of their total produce) for market. Although prior identification of such farmers was not possible, upon the completion of the survey it was found that 65 of the farmers are considered non-commercial and 38 of them commercial. The questions were directed to the households. Among other things, household characteristics such as age, education, farming experience, area of maize land owned as well as type of maize seed cultivated were recorded. Descriptions of household characteristics are based of data collected from the respondents.

Results of the survey reveal that both male and women engaged in cultivation of maize with the highest percentage (95.1%) of the respondents being male. Female accounted only for (4.9%). While 94.2% of these males were household heads, all the female respondents (4.9%) were household head because male heads were either died or moved to other area for some reasons. It is believed that age of the head of the household determines whether the household benefits from the experience of an older person or base its decision on the risk-taking attitude of the younger farmers. This study consisted of respondents with varying ages, ranging from 26 to 75 years (Table 5.1).

Table 5.1: Age of Respondents

Age	No. of Respondents	Percentage (%)
Less than 30	7	6.8
31- 40	56	54.4
41 – 50	23	22.3
51 – 60	12	11.7
Above 60	5	4.9
Total	103	100.0

Source: Field Survey, July – August, 2008

As depicted in the table above, most of the respondents (54.4%) were in the age range of 31 – 40 followed by those between 41 – 50 years (22.3%) and 51 – 60 years (11.7%). Only 6.8% of them represented farmers with 30 years of younger and some 4.9% farmers with age above 60 years. The survey result revealed that most of the respondents (57.3%) had elementary education, 11.7% junior education (grade 7&8), and 7.8% high school education. The highest level of education recorded was high school education. Around 23.3% (24 household heads) had no formal education at all, distributed over all age categories with 1 (< 30 years of age), the same 7 (31-40 & 41- 50 years), 6 (51- 60) and 3 of them (> 60 years). Overall, 23.3% of the sample was functionally illiterate. However, it seemed that the problem of household heads having never attended school is likely to decline over the years. Presumably, this implies that today's young will have had better opportunity to formal education by the time they become household head.

Large family size is a distinguishing characteristic in rural communities of many developing countries such as Ethiopia. The case is very similar in the rural communities of the study area. On average most of the household heads (52.4%) interviewed had a family size ranging from 6 – 10. Only 26.2% of them had a family size of less than 5, 12.6% of them between 11-15 and 7.8% of them between16-20. The survey result showed that family size decreased as schooling level increase. In the study, large family was observed among household heads who had no formal education and those who had just elementary education.

Farming experiences in relation to total farming and only maize is reported in Table 5.2.

Table 5.2 Farming experiences, total & specific to maize

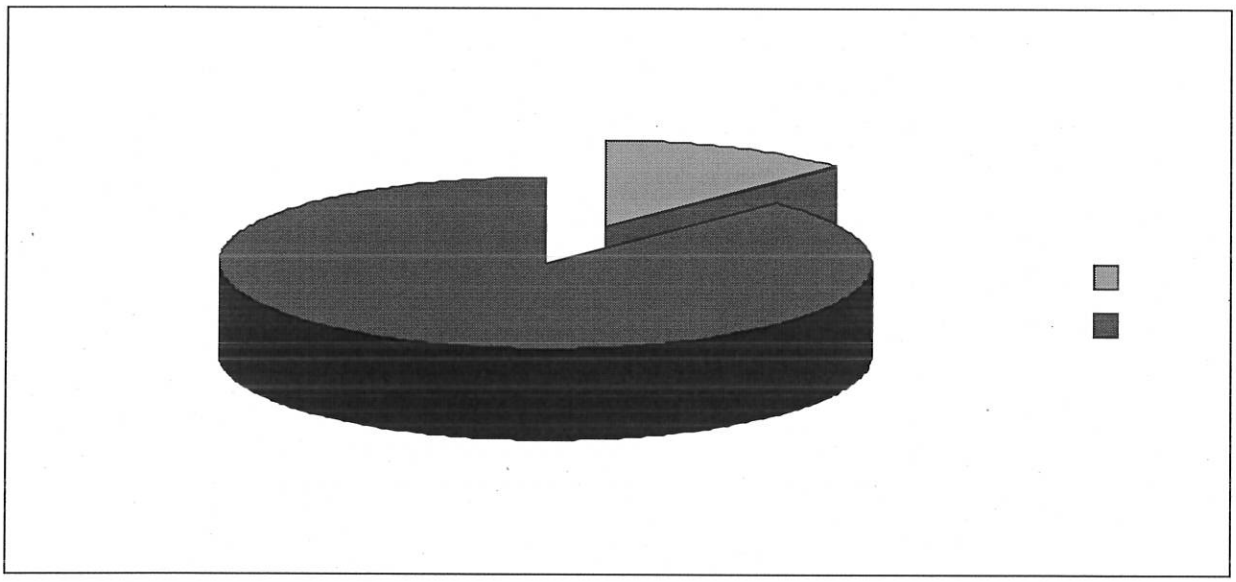
Years	Farming experiences related to maize		Total farming experiences	
	No. of Respondents	Percent	No. of Respondents	Percent
Less than 5 years	4	3.9	4	3.9
5- 10 years	24	23.3	25	24.3
11 -15 years	25	24.3	24	23.3
16-20 years	11	10.7	11	10.7
21 - 25 years	13	12.6	13	12.6
26- 30 years	12	11.7	12	11.7
Above 30 years	14	13.6	14	13.6
Total	103	100.0	103	100.0

Source: Field Survey, July – August, 2008

As indicated in Table 5.2, most of the households have had similar experiences either as farmer or maize farmer. Most of the households were cultivating maize right from the very beginning of their being a farmer. In either of the case most farmers have had farming experiences between 5-10 years, with 25.2% of them dominantly in maize cultivation and 23.3% of them in total farming. The average years of farming experience related to maize was 19 years and most household heads confirmed that they had spent all their farming times in cultivating maize.

When asked about employment and sources of income other than farming, 87.4% of the respondents mentioned farming as their main sources of employment. Only 12.6% of them indicated that they had off-farm activities largely trading as an alternative income generating activities (Fig. 5.1).

Figure 5.1 Off-farm works

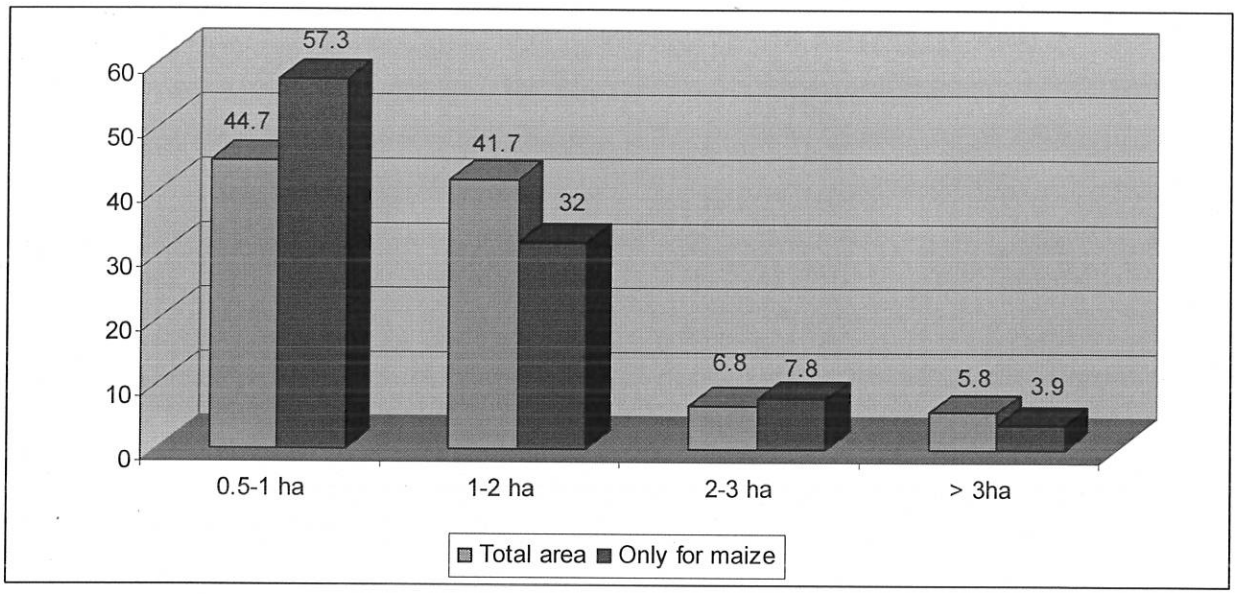


Source: Field Survey, July – August, 2008

Although farming is a vital economic activity in the area, most farmers are small-scale and subsistent presumably because of small area of land possession, which is less than one hectare (See Figure 5.2). Farmers interviewed owned maize land ranging from 0.5ha - 3ha. Maize land ownership is skewly distributed with 57.3% of the holdings owning less than one ha while at the other extreme 3.9% of the holdings have above 3ha. The rest of the farmers fall within this continuum. Those households who own land above 3ha are assumed to have more commercial oriented production. According to the information obtained from extension experts, those farmers who own land greater than 3ha are described as model farmers[8].

[8] Based on the information obtained from the Development Agent (DA) in the study area; model farmers are described as farmers who have variety of income sources than farming (i.e. farmer trader), use different inputs (e.g. modern maize seeds, fertilizers), rent land from other farmers, store maize, have relatively high financial capital, save money in the bank and have better living condition than other farmers.

Figure 5.2 Area of land owned and allotted to maize farming (%, n=103)



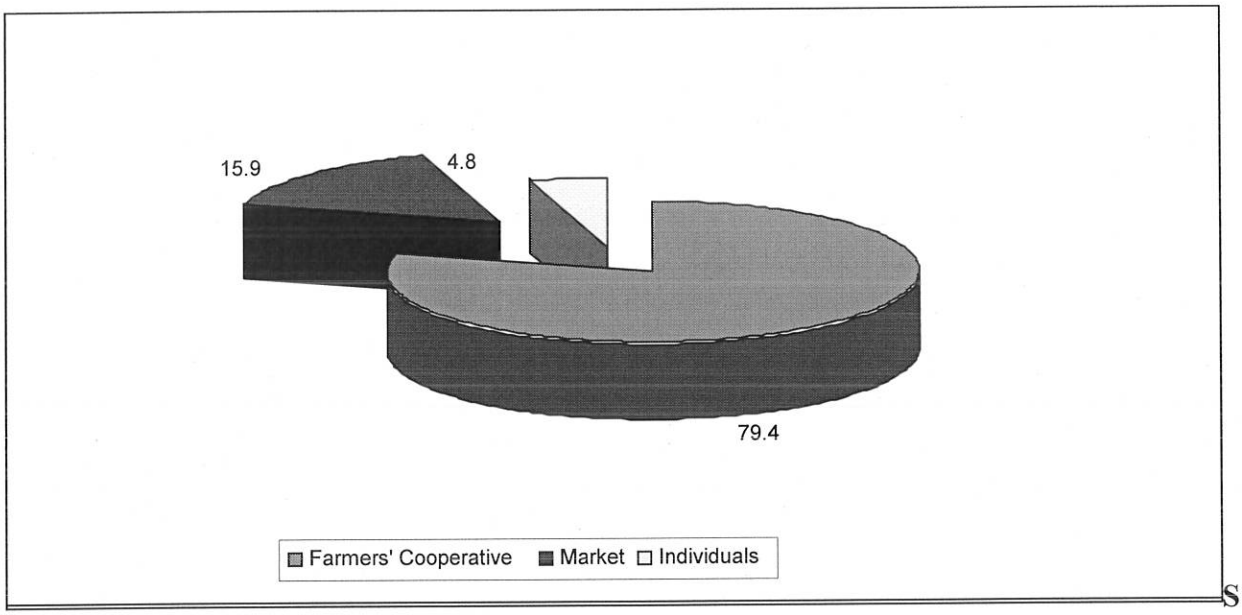
Source: Field Survey, July – August, 2008

In the focused group discussion, farmers also confirmed that small land size, among other things, is a major problem partly because they cannot rent it out and make money out of it and partly because they cannot allocate a portion of their land for other market-oriented high value commodities. Presumably this implies that the larger the area of the land owned, the higher the probability that farmers can see beyond traditional subsistent farming and move towards commercial oriented activities.

Access to Inputs: - modern maize seeds, fertilizers and credit services

Although modern maize seed varieties have important traits such as productivity and resistance to diseases, not all farmers got access to such seeds. While 69.9% of farmers interviewed cultivated modern maize varieties in 2006/07 cropping year, 30.1% of them reported lack of access to modern seeds. Regarding the sources of modern maize seeds for those farmers who got access to modern seeds, the majority (79.4%) of them indicated Farmers Cooperative as main sources while 15.9% of them purchased it from the market and very few of them (4.8%) from individuals around.(Figure 5.3).

Figure 5.3 Sources of maize modern variety seeds

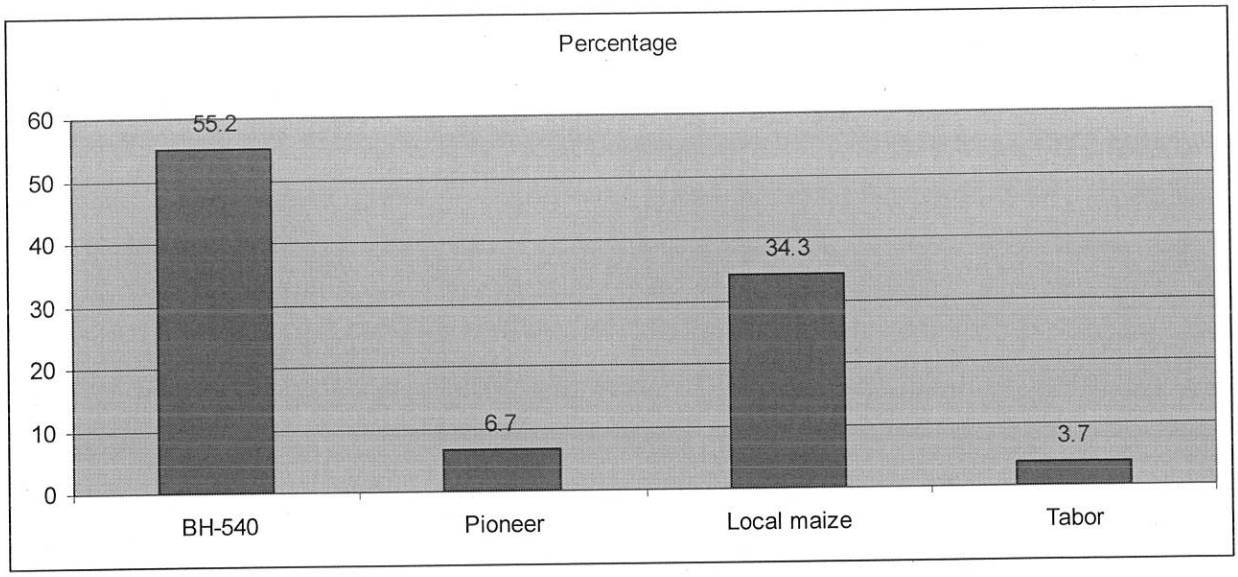


Source: Field Survey, July – August, 2008

This was also confirmed during the focus group discussion with farmers. The participants also noted that farmers' cooperative provides maize varieties for sells on cash only for its members. Membership to cooperatives entails registration fees as well as regular payment on monthly basis, which according to some farmers is quiet high for many poor farmers. As a result those farmers who couldn't become a member were totally excluded from any benefit from the cooperative. Although farmers' cooperative have good records in providing various services to farmers such as access to credit, market information, training and related services in other countries, farmers, cooperative in the study area are devoid of these services except providing fertilizers and seed varieties for sale on cash. This further exacerbates the problems especially for the poor farmers who may lack the capacity to purchase modern inputs without having access to credit.

The survey result reveals that the most popular and frequently cultivated maize variety in the area is BH540 (55.2%) followed by local maize (34.3%). This was also confirmed during the focus group discussion with farmers. Very few respondents also noted that they cultivated other maize seeds such as Pioneer (6.7%) and Tabor (3.7%), and were insignificant (Figure 5.4).

Figure 5.4 Types of maize seeds cultivated in 2006/07 (%)



Source: Field Survey, July – August, 2008

There is a wide range of reasons for which farmers cultivate different varieties of maize seeds. The reasons vary across households and are presented in the following table.

Table 5.3 Reasons to cultivate different maize seed varieties (General result)

Reasons	N	% of number of respondents
High demand	103	28.2%
Cheap in production	103	8.8%
Easy to get seeds	103	19.3%
High seed quality	103	19.3%
High productivity/yields	103	21.4%
No other option	103	2.9%

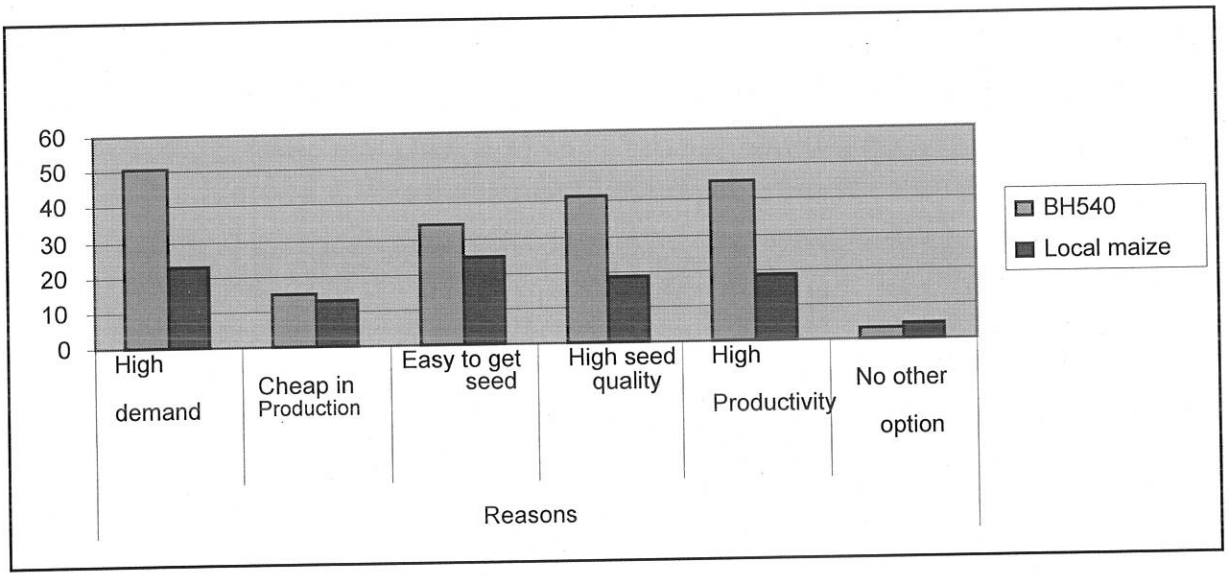
Source: Field Survey, July – August, 2008

Broadly speaking, high demand, high productivity and seed quality, as indicated in the above table, are the major concerns of farmers to select one maize variety over the others. When asked why they prefer BH540 modern maize to the local maize type, most respondents noted that the former, unlike the local maize type, is characterized by high demand, high productivity and high

quality. This was also confirmed during the focus group discussion with maize farmers. In addition to the aforementioned reasons for selecting BH540 maize variety, focus group discussion participants have noted that BH540 is preferred to other maize varieties mainly because it has: high price upon sell, high weight relatively to others, and high resistance to plant diseases and pests.

Local maize type was preferred next to BH540 mainly because it is easy to get the seed as well as it has relatively high demand by the poor who couldn't get access to modern varieties in the locality.

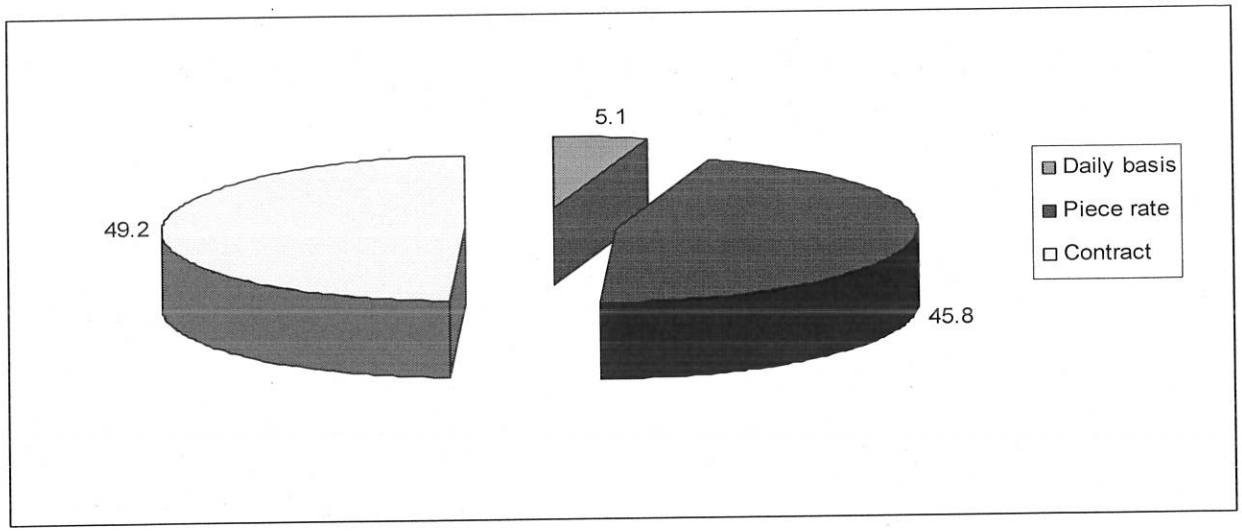
Figure 5.5 Reasons for selecting maize seeds (modern vs local), (%)



Source: Field Survey, July – August, 2008; Focus group discussion

Out of 103 maize farmers interviewed, only 58 of them hired labor during last harvest season, 2006/07 and they used different modes or ways to hire labor. These include contract, piece rate and on daily bases, being contract most important with (49.2%) followed by piece rate (45.8%) and daily basis (5.1%) (See figure 5.6).

Figure 5.6 Modes of labor hiring



Source: Field Survey, July – August, 2008

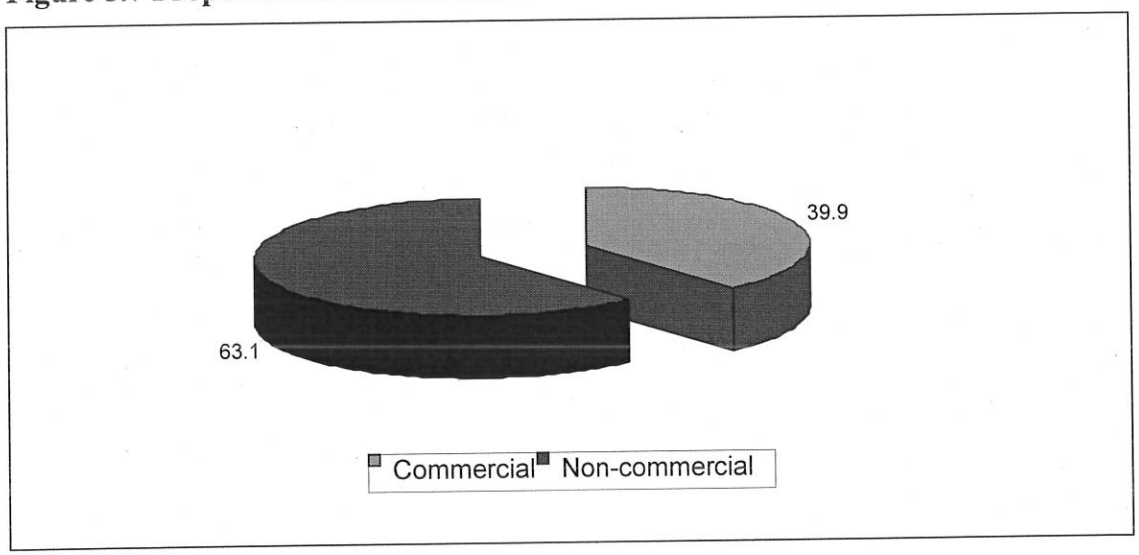
Among those households who hired labor, most (70.7%) of them noted that it was easy to hire labor. This is an indication of the existence of abundant labor in the rural areas which is consistent with the theory.

In addition to labor, respondents were also asked whether they used other inputs such as fertilizers, pesticides and herbicides in 2006/07. Most (43.5%) of the households used fertilizers followed by pesticides (37.0%) and very few (7.8%) of them used herbicides. Around 11.7% of them used compost as an alternative to modern fertilizers mainly because they are too poor to purchase the latter. Focus group discussion participants also noted this and underlined that though fertilizer is very essential for maize productivity, the price of fertilizer is untouchable for many of the farmers. The worst scenario, according to them, was absence of any support or credit facilities to farmers in this regard. Despite the fact that credit markets are very crucial for rural community, these markets are non-existence in the study area. The survey result shows that out of 103 farmers interviewed, 66(64.1%) of them were members to associations with farmers' cooperative accounted for the overwhelming majority (91.9%) of the farmers. The average year of membership was 5.1 years but no single farmer had been entitled to loan/credit access so far. This was also confirmed during the focus group discussion. In fact informants identified lack of access to credit as one major impediment in maize marketing and processing in the area.

5.2 TRANSACTION COSTS AND MAIZE MARKETING CHANNELS

As mentioned earlier, to draw an understanding of the marketing practice of maize farmers in the study area only those farmers who sold maize during 2006/07 cropping year were considered. These farmers can be described as commercial and non-commercial depending on the volume of their sales, as mentioned earlier (see chapter 3). Accordingly, out of the 103 maize farmers interviewed, the majority of them 65(63.1%) fell in to non-commercial category as they provided for sell less than 50 percent of their total production. 38(36.9%) of them sold more than 50 percent of their maize product for sell and can be viewed as commercial farmers. This implies that maize farming is a smallholder phenomenon which is consistent to the earlier argument made in chapter two. Most farmers lack market-oriented approach in their production which holdback the transition from subsistent production towards market-oriented production. As a matter of comparison between commercial and non-commercial maize farmers in the study area, it is found that commercial farmers unlike the latter have had better access to modern maize variety, fertilizers, hire labor, most of them belong to an association and had better storage practice etc.

Figure 5.7 Proportion of commercial and non-commercial farmers in 2006/07

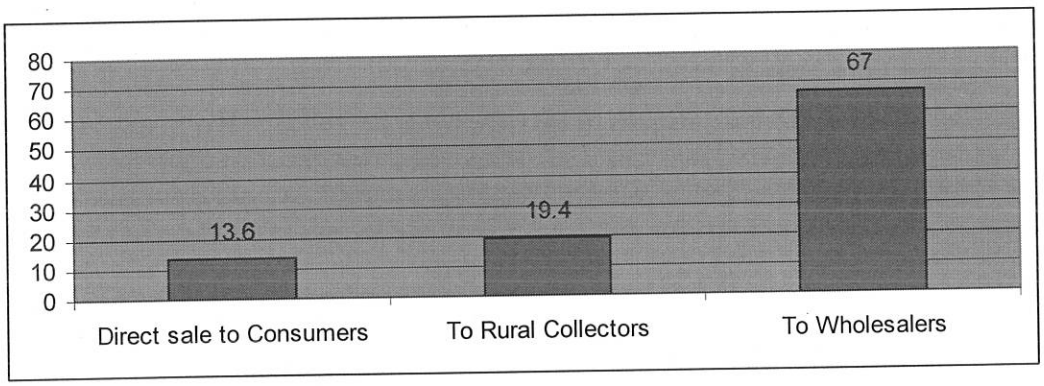


Source: Field Survey, July – August, 2008

The survey result indicates that the transactions of maize from producers to consumers were conducted through different marketing channels. These included direct sell to consumers or to intermediaries (e.g. assemblers, wholesalers, retailers). The study assumes that farmer's decision of market channel choice is discrete in the sense that farmers use only one outlet at one time sale. Farmers may sale to different channels at different time during one harvest time, hence to avoid this they were asked to indicate one market channel in which they sold the largest volume of maize at one time sales in 2006/07.

The overwhelming majority (97.1%) of farmers sold dry maize while only few (2.9%) of them sold "Green or fresh maize." This indicates that farmers sell maize unprocessed. Figure 5.8 shows the most preferred marketing channels by farmers in 2006/07.

Figure 5.8 Use of different marketing channels (%, n=103)



Source: Field Survey, July – August, 2008

As depicted in figure 5.8, the majority 69(67.0%) of farmers sold maize to the wholesalers or their agents along the highway market centers at the village town of Bura Borama. 19.4% of them sold to assemblers while only very few (13.6%) of them sold to consumers. Among 69 households who used the wholesale market, 39 of them were non-commercial farmers in the sense that they marketed less than 50% of their total maize production (Table 5.4). Out of 38 commercial farmers, most (30) of sold to the wholesale market presumably this market is more convenient to sell in large quantity.

Table 5.4 Number of farmers by category who sold to the wholesalers.

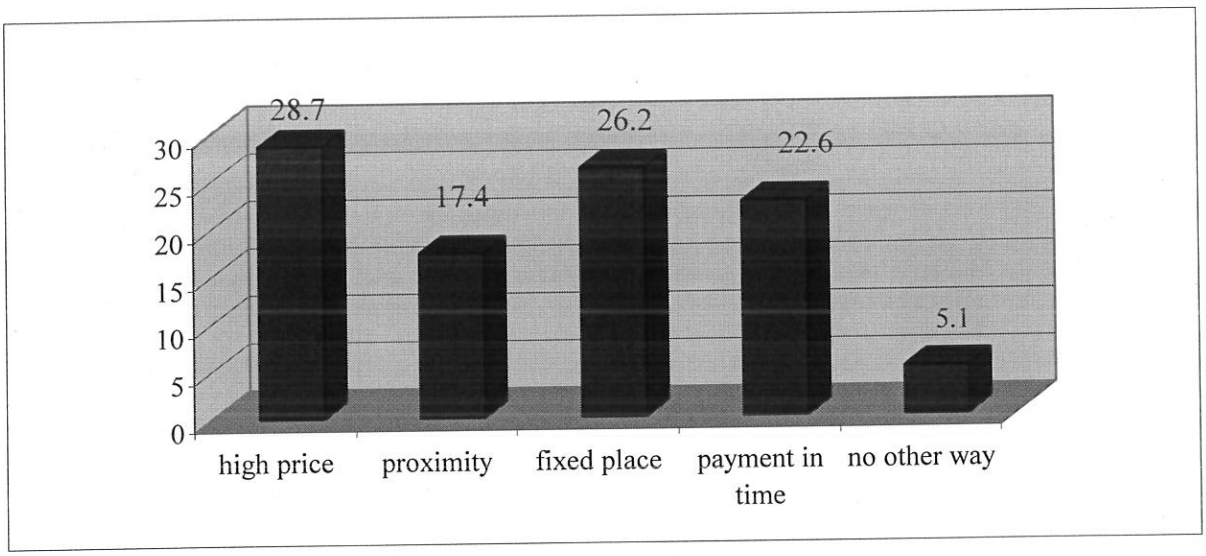
Type of farmers	Number of farmers used the wholesale market
Non-commercial farmers	39
Commercial farmers	30
Total	69

Source: Field Survey, July – August, 2008

The main regional wholesale market is located at the principal grain market (*ehile berenda*) of Arada market in the town of Shashemene. According to the survey result, the average distance to reach this market from the study area is 13 kms. On average it takes 2 hrs for farmers to access this market from their homesteads. More over, the average transportation cost for farmers to move their maize product from their homesteads to the main wholesale or grain market at Arada market is 30 Birr per quintal. Given this high cost, it is very rare that farmers in the study area take small quantities of maize product to the regional market at Arada. Put differently, it is much more costly for a farmer to transport small quantities over such distance than for a trader to transport large quantities over the same distance. This was also confirmed during the focus group discussion with farmers in the village town of Bura Borama. This implies that although previous studies (Eleni, 2001; RATES, 2003) noted that producers could access the main regional market up to 20 kms range, this is not necessarily the case in the study area. According to participants of the focus group discussion, the major reasons among other things, why farmers fail to participate in the regional market of Shashemene are poor road networks from the farm to the main asphalt, lack of appropriate transportation facilities and high transportation cost.

Figure 5.9 shows the main reasons for maize marketing channel choice in the study area. Those farmers who sold large volume of their maize product last year also shared the same reasons. They noted that a relatively high price, fixed selling place and payment in time were the main reasons for the selection of the wholesalers, ceteris paribus.

Figure 5.9 Farmer's reasons to select a marketing channel

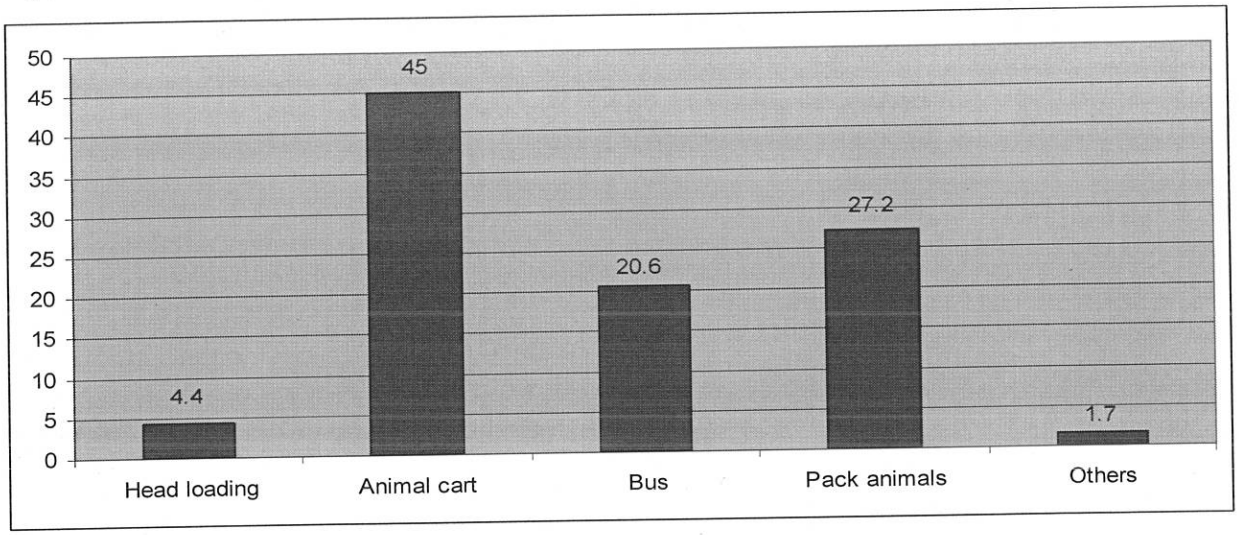


Source: Field survey, July-August 2008

Note: No other way refers to the case where farmers know the reason but not willing to explain.

They usually meet the wholesalers or their agents at the nearby village market station along the highway. The average price at this market was 151 Birr per quintal, ranging from a minimum price of 100Birr to 300 Birr per qt. To transport maize from their homestead to the nearby wholesaler's collection place along the highway, most (45.0%) of them used animal cart followed by pack animal (27.2%), bus (20.26) and head loading (4.4%) (Figure 5.10). Those farmers who settled along both sides of the highway used bus. Those farmers who live in remote areas of the kebele either used head loading, or pack animals or rent animal cart. Those farmers who couldn't move their product for various reasons sell to rural/farmer collectors at the farm gate and tolerate a relatively low price. Recently the role of rural collectors has been declining.

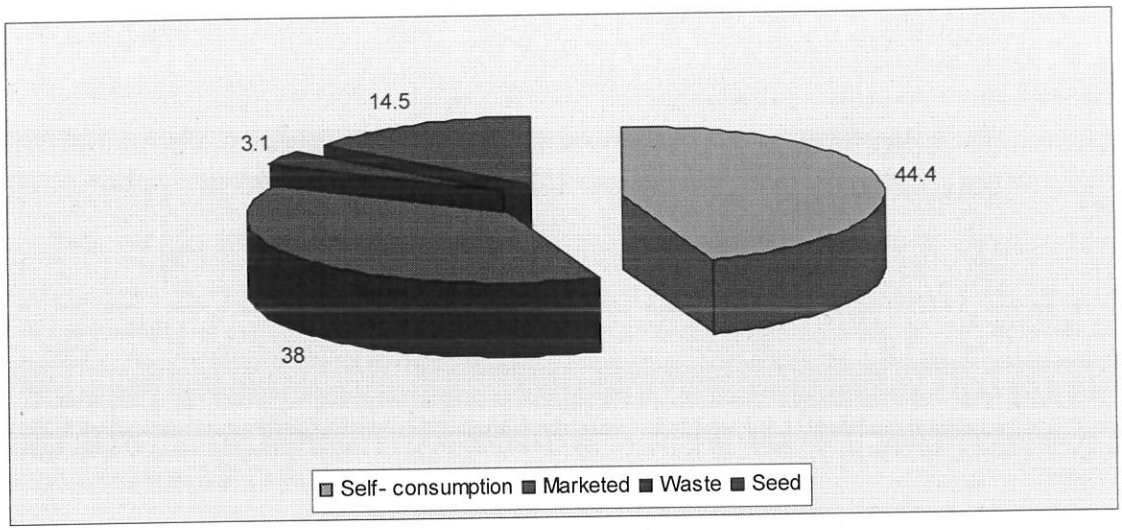
Figure 5.10 Means of transportation used by farmers during maize marketing



Source: Field survey, July-August 2008

According to the survey result, out of the total maize production during 2006/07 cropping year, 44.4% was used for self- consumption as depicted in Figure 5.11. 38 % of the total production was used for self-consumption. 38% was transacted through the different marketing outlets while 14.5 % was reserved for seed and 3.1% was lost due to pests and poor threshing conditions. To avoid losses during harvesting or threshing, according to participant's of focus group discussion, access to modern threshing tools is very helpful.

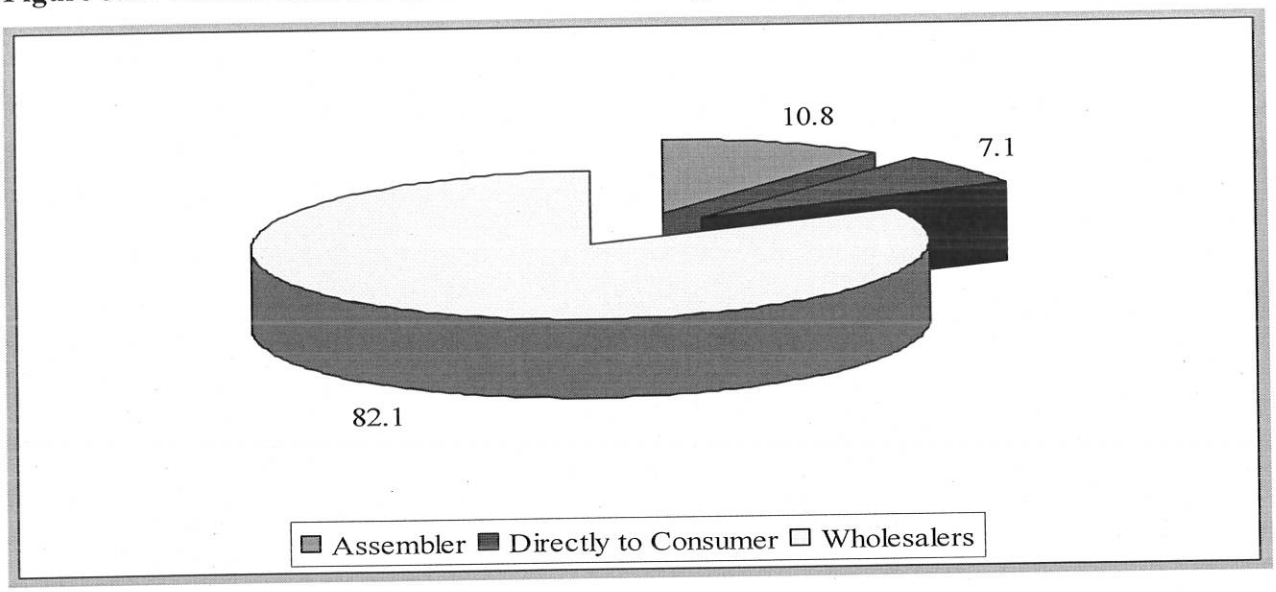
Figure 5.11 Proportion of maize traded to total maize production, 2006/07 (%)



Source: Field Survey, July – August, 2008

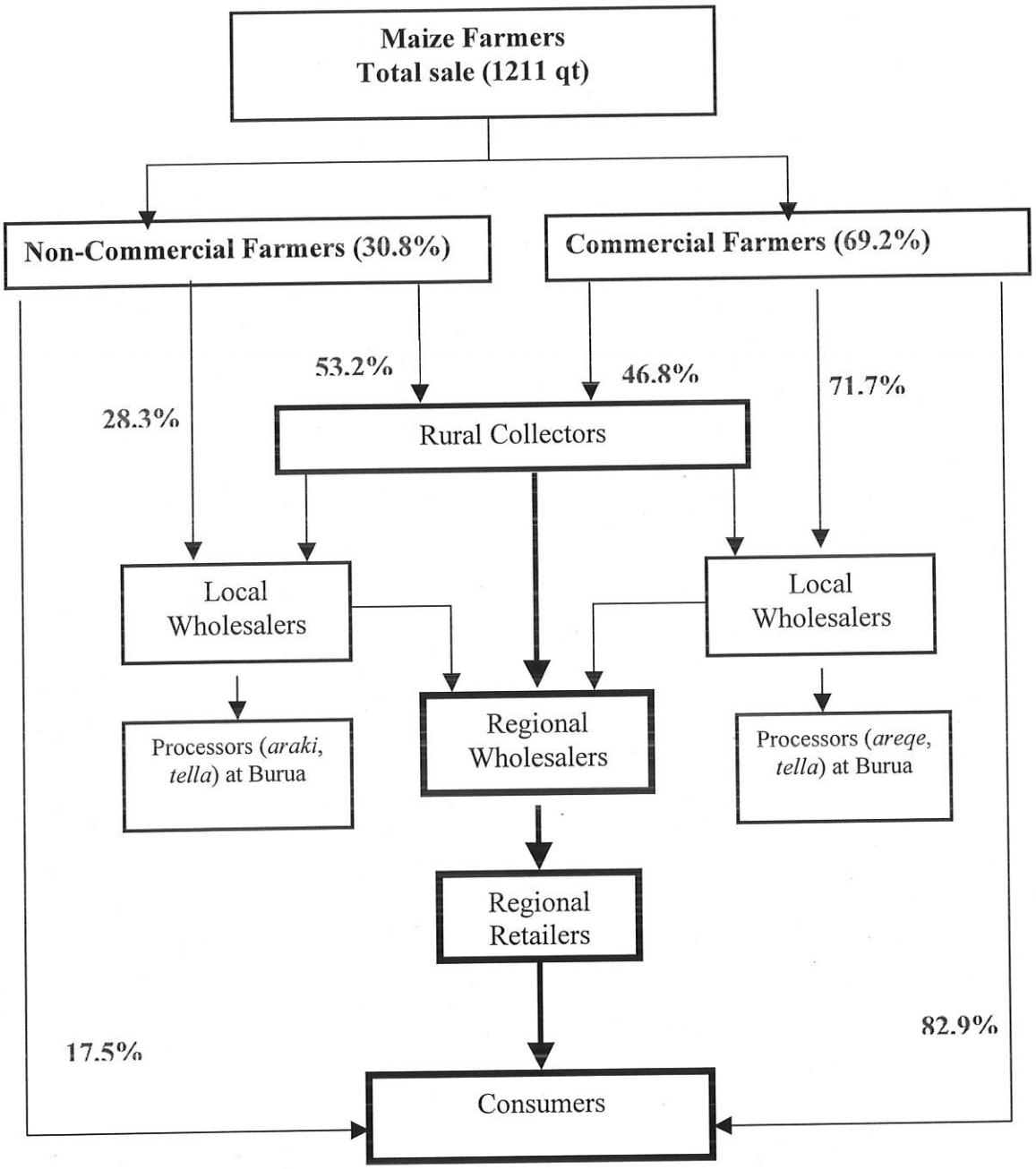
Figure 5.12 shows the proportion or volume of maize sales at the different marketing channels. Of the total volume of maize traded (1211qt), the larger proportions (68.2%) have come from those farmers who are described as commercial farmers and the remaining 30.8% from non-commercial farmers. Perhaps this may be considered as important insight that encouraging or promoting smallholder commercial-oriented production is vital to increase the volume of maize transaction. Despite some missing values as informants declined to indicate the volume of their sales, the following volume of maize sales is estimated at each market outlets with sales to the wholesalers assumed the loin share (82.2%), followed by sale to rural collectors (10.8%) and direct sales to consumers (7.1%). The wholesale market was chosen for large volume of sales, which is in fact consistent to the theory as this market usually accommodates large volume of purchase at a time. This is possible because the wholesalers usually own trucks and storage facilities.

Figure 5.12 Volume of maize sold at each marketing channel (% of total sales, 2006/07)



Source: Field Survey, July – August, 2008

Figure 5.13 Maize marketing channel in Bura Borama, 2006/07



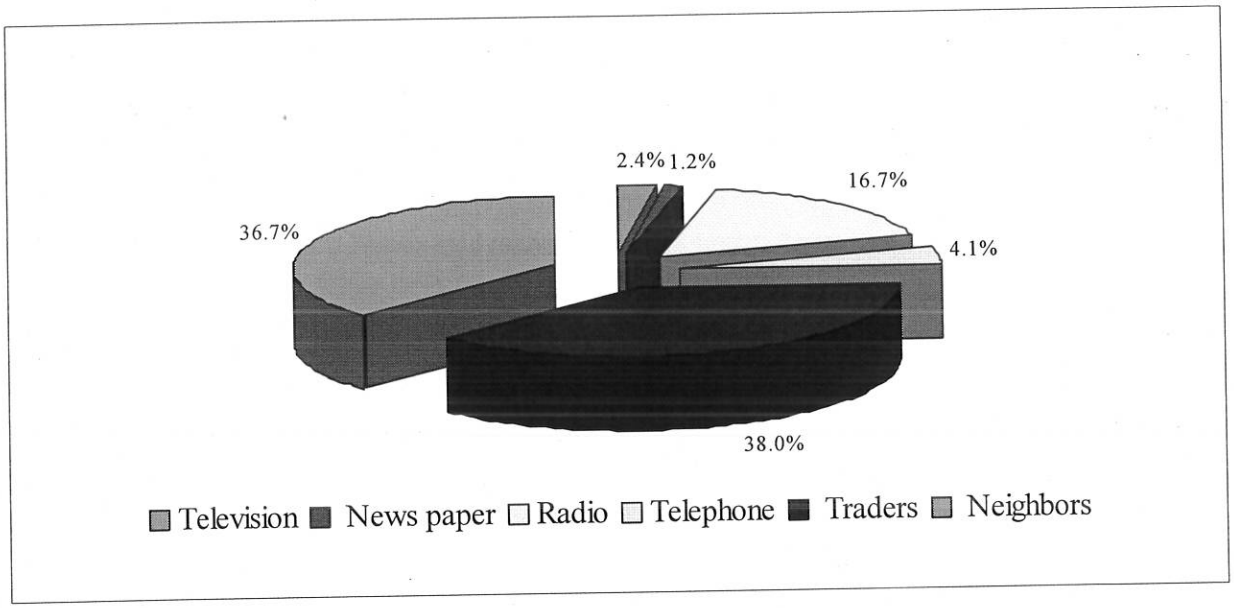
Source: Own compilation, Field Survey, July – August, 2008

Note: Numbers along the chains refers to the share of maize sales by commercial and non-commercial farmers at each marketing channel.

In the process of transfer from producers to consumers, a maize product passes through a channel involving a sequence of changes in their form and price. Farmers and other intermediaries such as assemblers, wholesalers and retailers play an important role in this transition of a product starting from the farm gate to consumers. The proportion of maize traded is different for different marketing channels as the form and type of transaction costs entailed along the marketing channels are different. As indicated earlier, the larger volume of maize sales accounted for commercial farmers. Farmers who have had commercial-oriented production contributed around 69.2 % of the total maize transactions in 2006/07 maize harvesting season. Maize farmers who lacked commercial orientation in their production contributed only 30.8 % to total volume of maize trading in the same cropping year. One very important finding of the study is that non-commercial smallholder farmers dominated maize transaction at the farm gate (i.e. farmer's sales to assemblers) with 53.2 % share in total maize sales at this marketing channel. This implies that for small quantities of maize sales farm gate markets are more convenient. Apart from the farm gate, however, the survey result shows that the share of maize sales is dominated by commercial farmers. For instance, commercial farmers as compared to non-commercial farmers contributed 71.7% and 82.9% of total maize transactions to the wholesalers and consumers respectively. This implies that the volume of maize transaction along the marketing channels is positively related to the degree of commercialization. This can be clearly observed from the chart where volumes of maize sales decrease along the channels for non-commercial farmers while it significantly increasing for commercial farmers.

A farmer choosing to sale his/her maize to a particular marketing channel such as the wholesale market is assumed to make that decision on the basis of information about the price on that outlet. The results from the survey show that the majority of respondents knew about market price from traders (38.0%) and their neighbors (36.7%). Sources of information are shown in figure 5.14. This result is consistent with earlier studies (Eleni, 2001). This is an indication of the extent to which farmers relied on traders and their neighbors to get market information where relationship and trust matter a lot. On the other hand, farmer's access to information through telephone (4.1%), television (2.4%), and newspaper were turned out to be insignificant. For some others (16.7%) radio was somewhat important sources of information. Thus, the ability of farm households to obtain useful market information from original sources is highly limited.

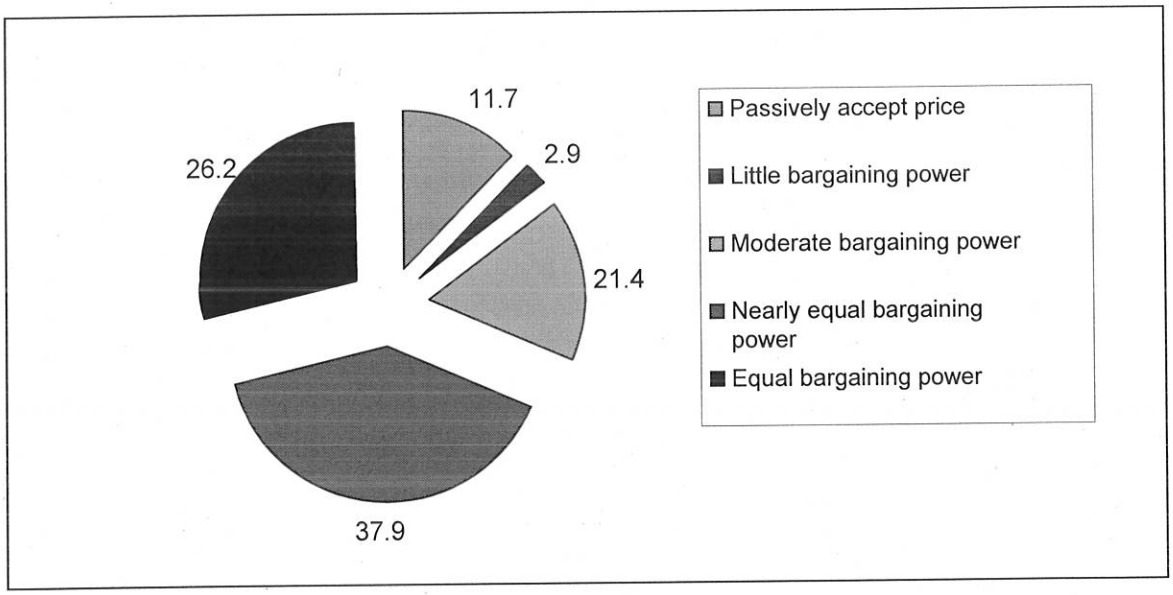
Figure 5.14 Farmer's sources of information related to market price



Source: Field Survey, July – August, 2008

On average farmers had to spend at least 2 days to gather information and decide their selling price. This together with poor road networks linking the farm to the market made accessing useful and relevant market information from original sources very difficult. When asked about their relative bargaining power on selling price, 39.3% of them indicated that they had nearly equal bargaining power over price with traders (Figure 5.15). This however, seems to be unrealistic because farmers are highly dependent on traders for price information where traders may not always offer them the right price information.

Figure 5.15 Farmer's bargaining power over selling price (%)



Source: Field Survey, July – August, 2008

Storage and Processing

Adequate storage facility enables producers to reap the benefit higher price by restricting sales during high supply season. The majority (90.2%) of respondents indicated that they usually store their produce at home before sales for sometime mainly for food security reason. However, the methods of storage used were traditional one such as *Gottera* and sacks, with storage using sacks accounted for (74.2%) and *gottera* accounted for (25.8%). In order to protect stored maize, farmers used pesticides. The reasons why very few (9.8%) of them couldn't store their maize product before sale was partly because the volume of production was too small just suffices for own consumption and partly because they had to sale it immediately after production in order to pay their debt, schooling fee, taxes etc.

When asked about processing maize products, almost all of the respondents underlined that they had no possibility to do some processing before selling maize. They sold maize without adding much value to it. They also noted that they didn't get any kind of support in this regard from any concerned body, be government or private institutions. Focus group discussion participants' highly emphasized on the importance of processing maize rather than selling as it is. According

to them, maintaining maize quality has been a major problem because of poor harvesting or threshing methods. As a result maize producers would accept low price. Access to modern threshing tools would be imperative to maintain the quality of maize products, since high-quality seed ensures both greater yield and greater income for the growers.

5.3 MAJOR CONSTRAINTS TO MAIZE MARKETING AND PROCESSING

Respondents have identified the following as major impediments to maize marketing and processing in the area under study.

Table 5.5 Major constraints of Maize marketing and processing

Major constraints	Percentage (%)
Lack of access to credit	26.0
Lack of modern storage facility	14.9
Small size of land	22.1
Lack of information	13.6
Poor access to means of transportation	8.9
Failure of payment	4.3
Labor is unavailable	7.7
Shortage of ox	2.6

Source: Field Survey, July – August, 2008; Farmers' Focus-group discussion

According to the survey result, lack of access to credit (26%), small size of land possession (22.1%), lack of information related to market issues (13.6%) and lack of storage facility (14.9%) were the main impediments to maize marketing and processing in the area of study. Further more, focus group discussants emphasized that high costs of transportation and fertilizers were also major impediments.

CHAPTER SIX: EMPERICAL RESULTS AND DISCUSSIONS

The general model analysis was made using multinomial logit model. Where the total 103 maize farm households can choose three different maize marketing chains: direct sales to consumers at the wet market (14 samples); sales at the farm gate to collectors (20); sales to traders at the whole sale market (69) (see figure 6.1).

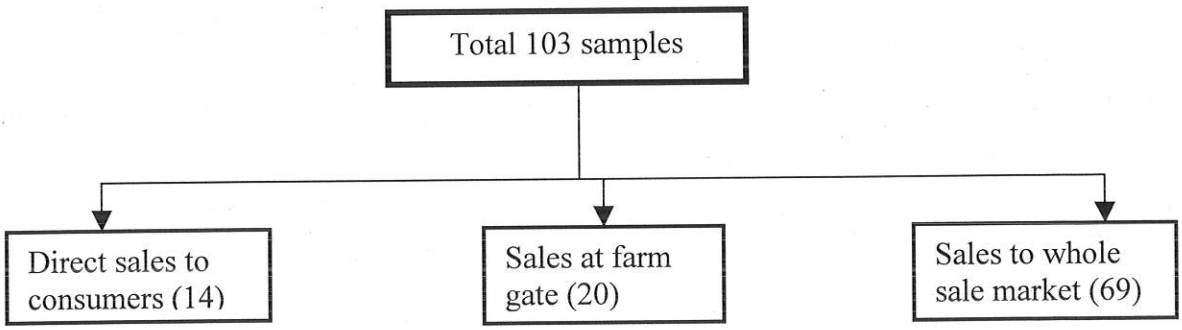


Figure 6.1 Marketing channel choice structure for multinomial logit analysis.

A multinomial logit models were estimated to analyze the use of market channels by maize farmers.

The model significance and goodness of fit values for the equation is reported in Table 6.1. The likelihood-ratio chi-squared had a value of 63.24. These models are statistically significant since the p-value for the chi-squared was equal to "0.0" for the equation. Pseudo-R^2 is a measurement of goodness of fit that indicates how well the model explains the variation in channel choice. Therefore, 42.3% of the variation of marketing channel choice was explained by the model. Although, the pseudo-R^2 is not equivalent to the R_2 that is found in the ordinary linear regression model, the values of our measurement of goodness of fit are considered high for qualitative variables models.

Table 6.1 – Measurements of goodness of fit from multinomial logit model

Log likelihood	-49.975756
Number of observations	103
LR chi2 (16)	63.24
Probability > chi2	0.0000
Pseudo R2	0.4237

Source: field survey, July – August 2008

The author also checked for potential multicollinearity problem. We use the correlation matrix (refer appendix E) and VIF (Variable Inflation Factor) (see table 6.3) methods to detect for multicollinearity. None of the correlation coefficients for the variables used in the model are greater than or equal to 0.80. The highest coefficient in Table 6.3 (Appendix E) for testing multicollinearity for variables used in the multinomial logit is 0.355, between AGE AND TFAMSZ2. Examining the VIF coefficients, all variables in both tables are 1.28 or smaller. It is found from both results (correlation coefficient less than 0.8 and VIF less than 10) that multicollinearity is not a problem.

Table 6.2 The results of multicollinearity test: Variance Inflation Factor (VIF)

Variables	VIF
AGE	1.28
KNOW	1.24
TFARSZ2	1.23
EDUCH	1.18
OWN_CART	1.14
DELAY	1.10
COORDTR	1.09
SPENT	1.07

Source: field survey, July – August 2008

The results from the multinomial logit model are in the form of log odds ratios that relate alternatives choices to a base or reference (wholesaler channel). The log odds ratio then shows

whether a change in the independent variable makes the choice of more or less likely. Where the total 103 farm households can choose three different maize marketing channels: direct sale to consumers at the wet market (14), sale to rural collectors at the farm gate (20) and sale to wholesalers (69) (see figure 6.3).

Table 6.3 Results of multinomial logit model for the choice of marketing channels[$]

Independent Variables	Direct sells to consumers Choice = 1	Sells to rural collectors Choice = 2
Constant	1.176561	1.092714
	(3.003139)[z]	(2.132656)
AGE	-3.619767	.5665547
	(.9809012)***	(.3008653)*
EDUCH	3.040763	-.028043
	(1.245441)**	(.4041048)
TFARSZ2	-.1417006	-.1520131
	(.1111817)	(.0776083)*
OWN_CART	2.535941	-.1679719
	(.9873945)**	(.7223707)
KNOW	1.965351	-.3351369
	(.9760877)**	(.728233)
DELAY	-6.042461	-.2955383
	(1.63115)***	(1.292759)
SPENT	-1.191946	-2.476289
	(.4271378)***	(.5976932)***
COORTRP	-3.544346	1.316733
	(1.523213)**	(.7465816)*

*= significant at 10%; **= significant at 5%; *** = significant at 1%

[$] (Choice==whol is the base outcome)

[z] Values in brackets are standard errors

At the top of the table, the different marketing channels are shown. The result shows that some of the variables are significant at both market outlets while some others are significant in one

marketing channel but not in the other channel. The results suggest that the probability that maize farmer's decision to sale directly to consumers at the wet market is significantly and positively influenced by access to market price information (KNOW), level of household education (EDUCH) and possession of means of transportation (OWN_CART) to transport maize to the market. The age of the household head (AGE), transport coordination problem (COORDTRP) and the occurrence of payment delay upon transaction (DELAY) and the time spent to reach market and accomplish a one time sell (SPENT) are significantly and negatively influenced farmer's decision to choose the wet market for direct sell to consumers as compared to sale to the wholesalers (reference group).

The probability of choosing to sell to rural collectors is significantly and positively influenced by household head age (AGE) and lack of coordinated effort by farmers to organize transportation (COORDTRP), and negatively by time spent to reach to the mainstream market (SPENT) and total farm size (TFARSZ).

The result shows that household head age (p- value = 0.000) is significantly and negatively related to direct sale to consumers (DIRE) and significantly and positively (p- value = 0.060) related to sale to rural collectors. This implies that an older person being less mobile would go for the schemes that made marketing available at his doorsteps. This may give sense because as farmers getting older, they may be physically weak to travel to the distant market to sell and rather they would go for the relatively closer outlet that can be made possible by rural collectors. More over, most of the old farmers were uneducated and there fore they were found less likely to move to the market as they may be less active in understanding and processing the required market information. This result is consistent to earlier study by Musemwa et al (2007). Level of education was found significant (p- value = 0.015) to have a positive influence on the decision of farmers to participate in direct sells to consumers. All the farmers who were using the wet market were educated. This implies that as farmers' level of education increases there would be higher probability of choosing the marketing channel where they can directly sell to consumers, ceteris paribus. Total farm size seems to have more of a quadratic relationship with the probability of choosing rural collectors and to investigate its effect farm size squared (TFARSZ2) was calculated. Farm size squared is significantly (p- value = 0.050) and negatively correlated to the

decision to sell to rural collectors compared to wholesalers. This implies that as the land size increases, farmers are less likely decide to sell to rural collectors. Presumably this may be because larger farm size means larger cultivable land for maize and hence more productivity. As indicated earlier the wholesale market provides market for large volume of sells as compared to rural collectors (Eleni, 2001; Lu, 2007). The ability of the farmer to acquire useful information on market price (KNOW) is significantly (p- value, 0.044) and positively related with the decision of the farmer to got to the main market to sell. Put differently, there exists a negative relationship between selling to directly to consumers and information costs. This implies that as the search and information costs increase, rural households sell more of their maize to middlemen (i.e wholesalers) instead of selling to direct consumers.

One of the major components of transaction cost this paper claim to have stronger impact on the decision of farmers where to sell is transportation cost. This is consistent with earlier empirical findings (Prabhu et al, 2005) where higher transportation costs limited smallholders' access to market. Although distance to market is found to be more common proxy to estimate transport cost, this study couldn't used it as some of the households failed to provide accurate information on the distance to their preferred marketing channel. Transport cost can be estimated by using a proxy variable (COORDTRP) that indicates the prevailing problem to coordinate means of transportation with producers. The variable COORDTRP was significantly and negatively correlated to the decision to sale at the wet market (p- value = 0.020) while it is significantly and positively correlated to sell to assemblers at the farm gate (p –value = 0.078) in reference to the wholesale market (reference group). The result shows that lack of coordinated action by farmers lead to lower probability of market participation and higher probability of the decision to choose the out let at the farm gate. Further more, farmers' access to animal cart (OWN_CART) was significantly and positively (p- value = 0.010) influencing the decision to directly sell to consumers at the main market. This result is consistent to previous studies, Eleni (2001).

Another variable that influence maize farmer's decision to choose a marketing channel is the possibility of payment delay (DELAY). It significantly (p- value = 0.000) and negatively affected the probability of choosing direct sale to consumers over wholesalers (reference category). A payment delay while selling directly to consumers will induce farmers to switch to the

wholesalers. The time spent to reach the market and accomplish a one time sell (SPENT) is significantly and negatively correlated (p- value = 0.005) to the decision of the farmer to involve in direct sell to consumers. It is also found significantly (p – value = 0.000) and negatively influenced the probability that farmers may decide to choose the market outlet to sell to rural collectors. Keeping other things constant, this suggests that the longer the time required reaching the preferred market channel in relation to the reference out let choice, the higher the probability that farmers prefer wholesalers to the other market out lets. Presumably, the longer time spent to arrive at the market associated with poor coordinated means of transportation might have explained why only small number farmers had preferred the out let (DIRE) to the other out lets.

The relative risk ratios (Table 6.4) implies that for a unit change in the predictor variable, the relative risk ratio of the outcome relative to the base category[9] is expected to change by a factor of the respective parameter estimate given the variables in the model are held constant. Table 6.6 also reports the elasticities for the multinomial logit model.

Table 6.4 Relative Risk Ratio on Probability of Marketing out let Choices[$]

Independent Variables	Direct sells to consumers Choice = 1	Sells to rural collectors Choice = 2
AGE	0.0267889	1.762185
EDUCH	20.92119	0.9723466
TFARSZ2	0.8678811	0.8589771
OWN_CART	12.62831	0.8453776
KNOW	7.137415	0.7152401
DELAY	420.9276	0.7441309
SPENT	0.3036299	0.0840545
COORTRP	0.0288875	3.73121

[$] (Choice=3, whol is the base outcome)

[9] In the econometric estimation of the MNL model, the most frequent response is usually taken as the reference category (Long and Freese, 2001). However, the choice of which category is chosen as the reference category does not influence the estimation results, it only affects the way parameter estimates are to be interpreted.

Table 6.5 Elasticities of the multinomial logit model for choice of the different maize marketing channels

Independent Variables	DIRE Choice = 1	TRAD Choice = 2	WHOL Choice = 3
AGE	-9.211348	1.356065	-.0740729
	(2.48913)	(.70429)	(.07891)
EDUCH	7.484783	-.0829508	.0137963
	(3.07101)	(.93031)	(0.06895)
TFARSZ2	-.4874381	-.5257845	.039468
	(0.41006)	(.27112)	(.02652)
OWN_CART $^{\$}$	.9868113	-.0632521	.0019797
	(0.38024)	(0.26200)	(0.0189)
KNOW$^{\$}$	.5391065	-.0862687	.0048365
	(0.26257)	(0.18442)	(0.01403)
DELAY$^{\$}$	-0.035538	-.0253801	.0004436
	(0.14753)	(0.10453)	(0.00856)
SPENT	-2.424522	-5.472033	.4037449
	(1.0241)	(1.48051)	(0.14177)
COORDTR$^{\$}$	-4.257948	1.452641	-.0942016
	(1.78425)	(0 .83207)	(0.07036)

($) dy/dx is for discrete change of dummy variable from 0 to 1

CHAPTER SEVEN: CONCLUSIONS AND RECOMMENDATIONS

This chapter provides a brief summary of the results of the study based on the descriptive statistics and empirical estimations followed by discussion of conclusions drawn from the earlier chapters. Policy implications are suggested to give some insights to improve maize farmers marketing performance in the study area.

It has been determined that market exchanges do not occur in a frictionless environment. This implies that transaction costs are a fact of life in any business transaction such as maize marketing in the study area. These transaction costs can assume the forms of information, negotiation, monitoring as well as asset specificity or household characteristics. As hypothesized these costs do affect the decision of the household to select a marketing channel.

Results of the study show that maize farmers are less likely to participate in the marketing channel where they can reap the benefit of higher price by directly sale to consumers. The main reason for this is that farmers face high transaction costs particularly costs related to information on market price as well as transportation costs, which accounted to more than 45% of total marketing costs. The high information cost is due to lack of access to original and useful market information as most of the farmers reported that they obtained information from other sources such as neighbors and traders. High transportation costs was largely related to distance from the main market, bad road conditions linking the homestead to the market and absence of coordination effort among farmers to arrange means of transportation to take their produce to the market. The fact that most of the farmers are subsistence even more complicated the problem in the sense that it would be too cost to carry small quantity of maize independently and move to the market.

The study shows that age of household head negatively influenced the probability of farmers' to choose to sell directly to consumers at the mainstream market. It however, positively induce their decision in relation to their decision to choose sell to assemblers around their homestead of the farm gate. Education has been found significant to positively influence household decision to choose direct sells to consumers.

The empirical analysis reveal that better access to market price information and good road infrastructure associated with good transportation coordination by farmers will significantly increase the probability that farmers may decide to choose to participate at the main stream market where by enjoy a relatively higher price to their produce as they are able to directly sale to consumers. The study also shows that a potential payment delay in the chosen market outlet will decrease farmers' probability to select this market. The result fixes a positive relationship between the time required to reach the market and farmer's decision to sale at the farm gate. Perhaps this together with bad road networks and lack of coordinated efforts by farmers to arrange transportation of their product to the market might have explained why most of the farmers failed to sale directly to consumers at the wet market and secured better return.

Several policy recommendations can be drawn for the research are to minimize the prevailing high transaction costs involved in maize marketing so as to improve producers benefit from their trade transactions.

To start with, dissemination of market information to the small-scale maize farmers is very essential to increase the probability that farmers can receive higher price for their maize product. Access to available information that is user friendly and relevant remains a problem in the small-scale sector. Given markets are incomplete in rural areas; this state of affairs clearly needs strong government intervention. Not only does it require setting up an information gathering and analysis system, but a strong emphasis will have to be put on ways to disseminate such information to ensure optimal access. The main thrust for this would ideally be to train farmers on how to use information (e.g. price determination and market requirements and/or product specifications) and also to supply information to the small-scale cattle farmers. Therefore, provision of relevant information about production and markets should be seen as an integral part of an agricultural market development programme. Secondly, there should effort to be made to strengthen existing Farmers' Cooperative and encouraging the establishment of Producer Organizations (POs) towards a collective action to lower transaction costs. Although farmer cooperative has been in place in the study area, some of the poor farmers are excluded from membership. This implies that that generally farmers need to be encouraged to work

cooperatively in the procurement of production inputs, managing utilization of their land and infrastructure, obtaining marketing-related information and collectively marketing their maize produce. Collective action by producer organizations can reduce transaction costs in markets, achieve some market power. For smallholders, producer organizations are essential to achieve competitiveness and hence it is critical that they should be strengthened in terms of human and financial resources.

Thirdly, attempt should be made to improve the road infrastructure linking the farm to market. The quality of the road was found to be positively correlated to market participation while distance to market was negatively correlated. This implies that improving the quality of the road in the study area would reduce the time spent to reach the market and hence lower transportation costs. It could also facilitate efforts made by farmers to organize transport to move their product to market. There fore, improvement of rural road networks with the intention of linking smallholders to markets should be seen as an integral part of any development strategy of agricultural marketing in the study area. Fourth, enabling product and input markets work better for the poor to reduce transaction costs. Reducing transaction costs and risks in food staple markets such as maize can promote faster growth and benefit the poor. Encouraging commodity exchange and market information system can help smallholder farmers to reduce transaction costs.

Finally, the study makes the following recommendation for further research. Since this research includes only information regarding producers' marketing practices, the analysis of the existing relationship between main actors and marketing channels might be more accurate if information of the other participants in the market is included. Future research with data collected from both producers and buyers could improve the understanding of the marketing situation in the maize sector. Furthermore, this information might enhance the understanding of value chain analysis to investigate the major impediments within the value chain frame work.

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ANNEX

Annex A: A brief description on the unique characteristics of maize

Maize is known for its efficiency of absolving the energy of the sun and converting it to food and hence emerges as major sources of calories for peoples in many parts of the world, Garki et al (2004). Maize has wider climatic adaptability. Melinda and Jayne (2003) indicate that maize is the world's most widely cultivated cereal, grown across a range of agro-ecological zone, i.e. range of latitudes, altitudes, moisture regimes, slopes, and soil types. Maize offers higher yield per hectare as compared to other cereals. Returns to labor are likely to be higher for maize as compared to other cereals. As Melinda and Jayne (2003) note that "maize is protected from birds damage by its leafy covering, while the exposed grain of sorghum and millet requires labor time for scaring birds." Taking the global maize utilization in 1996, Garki et al (2004) have noted that out of the total production of 579 million tones, 387 million tons went as animal feed, and 100 million tons used for direct human consumption. They have indicated that maize is used for direct human consumption as roasted ears, breakfast cereal, pudding, soup, fermented paste, couscous and alcohol. It is an important source of carbohydrate and more complete in nutrients as compared to other cereals. Moreover, maize protein content is higher than paddy and polished rice and maize fat continent is higher than that of wheat, sorghum, and rice. It is also used as animal feed. Every part of the maize such as the grain, the leaves, the stalk the tassels and even the roots entails an economic value. According to this study, maize is an important stable food in Sub- Saharan Africa for around 50% of the population. Among these people, maize is used as a direct consumption as different varieties of starch base such as porridge, pastes, grits, and beer. In addition to this, "green maize (fresh on the cob) is parched, baked, roasted or boiled and plays an important role in filling the hunger gap after the dry season." Thus, as stated by Garki et al, maize more than any other crop, provides the promise of meeting African's food needs in the current millennium as no other cereal can be used in as many way as maize. Assisting small scale farmers to raise maize production and productivity through input provision (improved seed variety) and creating access to market information is therefore imperative.

Annex B Production and marketable surplus of grain in 1995/96

Type of grain	Annual production (**million quintals**)	% production that is marketed	Total marketed quantity (**million tones**)
Cereals	83	26	21.6
Teff	19	24	4.5
Wheat	12	25	3.0
Barley	7	31	2.2
Maize	**22**	**25**	**5.4**
Sorghum	20	12	2.4
Pulses	8	37	3.1
Oilseeds	2	71	1.3
Others	1	52	0.5
Total	94	28	26.4

Source: Amha, 2001:61 based on CSA data, 1995/96

Annex C Producer prices, wholesale prices, and retail prices around Shashemene, 1998-2001

Year	Producer price, Birr/qt	Wholesale price, Birr/qt	Retail price, Birr/qt	Marketing margin (the difference between producer and retail prices)	Ratio of producer price to retail price (%)
1998	77.6	83.4	90.6	13	85.6
1999	117.7	123.9	135.1	17.4	87.1
2000	113.7	120.3	127.3	13.6	89.3
2001	51.1	57.0	63.5	12.4	80.5

Source: Dender, 2002:95.

Annex D Pearson Correlation Coefficients of the Exogenous Variables for the Multinomial Logit Model.

	AGE	EDUC	TFARSZ	OWN_CART	KNOW	SPENT	DELAY	COORDTRP
AGE	1	-.315	-.355	-.062	-.016	-.139	-.010	-.039
		.000	.000	.533	.971	.162	.919	.699
	103	103	103	103	103	103	103	103
EDUC	-.315	1	-.010	.137	-.085	.176	-.098	-.013
	.000		.918	.166	.394	.075	.326	.898
	103	103	103	103	103	103	103	103
TFARSZ	-.355	-.010	1	-.093	-.164	-.071	-.094	.017
	.000	.918		.348	.098	.477	.346	.867
	103	103	103	103	103	103	103	103
OWN_CART	-.062	.137	-.093	1	-.248	-.061	-.036	.001
	.533	.166	.348		.011	.541	.721	.996
	103	103	103	103	103	103	103	103
KNOW	-.016	-.085	-.164	-.248	1	-.048	-.128	.179
	.971	.394	.098	.011		.629	.197	.054
	103	103	103	103	103	103	103	103
SPENT	-.139	.176	-.071	-.061	-.048	1	.040	-.173
	.162	.075	.477	.541	.629		.691	.080
	103	103	103	103	103	103	103	103
DELAY	-.010	-.098	-.094	-.036	-.128	.040	1	-.129
	.919	.326	.346	.721	.197	.691		.193
	103	103	103	103	103	103	103	103
COORDTRP	-.039	-.013	.017	.001	.179	-.173	-.129	1
	.699	.898	.867	.996	.054	.080	.193	
	103	103	103	103	103	103	103	103

Annex E-a List of Key Informants

No.	Name of informant	Sex	Position in the value chain
1	Etefa Ali	Male	Farmer
2	Jula Edamo	Male	Rural Collector
3	Desta Hamit	Male	Seed distributor
4	Chala Ali	Male	Retailer
5	Worke Erago	Female	Processor (trad. Areqe brewer & saler)
6	Takabe Asefa	Male	Wholesaler
7	Cooperative	Male	Input (fertilizer) provider

Annex E-b: Farmers' Focus Group Discussion

Annex E-c Farmers Focus Group Discussion Participants

No.	Name of participants	Sex	Age	Address	Category
1	Worke Erago	Female	40	Bura	Model farmer
2	Awol Sulito	Male	32	Ute	Medium Farmer
3	Shukure Argo	Male	46	Bura	Model Farmer
4	Mileso Gelato	Male	28	Bura	Medium Farmer
5	Feyisa Jeldo	Male	35	Borama	Lower farmer
6	Ahmed Sufa	Male	36	Bura	Lower farmer

Annex F: Animal cart (donkey-driven) is a popular means of transportation of commodities

Annex G A partial view of the village town of Bura Borama, August 2008

Annex H: Questionnaire for Maize Farmers

Part I: Location and Demography of Households

1. Location of the farmers/households

Region _____ Date of interview _____

Town _____ Starting time _____

Village _____ Ending time _____

Place of interview _____ Interviewer _____

Name of interviewee _____

2. Demography: - Household members and their characteristics

2.1. Relationship with head of household. ☐

1= husband 3= son

2= wife 4= daughter

2.2 Age (year) _____

2.3 Level of education: ☐

1= No education 3= Elementary education

2= High school 4= Junior education

5= Informal education 6= other, specify _____

2.4 Marital status: _____ ☐

1= single 3= married 5= other, specify _____

2= divorced 4= widow

2.5 Family Size _____

2.6 Total farming experience (years) _____

2.7 Total farming experience related to maize (years) _____

2.7 Off-farm work and place (if any) _____

2.8 Off- farm income (if any) _____ (Birr).

Part II: Maize Cultivation/Production)

1. Total land holding _____ ha/timad/gasha
2. Maize land _____ hectar/timad/gasha
3. Did you get access to modern maize variety seeds last year? 1= yes, 2= no.
4. If yes, where did you get it? _____
5. Which maize variety did you cultivate last year?

   5.1 BH540 5.2 Poineur 5.3 local maize 5.4 others, _____

6. What were/was your reason/s to cultivate this variety?

   4.1 high demand 4.2 cheap in production

   4.3 easy to get seeds 4.4 high seed quality

   4.5 high yield 4.6 others reasons _____

7. How many years having produced this maize type? _____ years.
8. What was the price of this seed? _____ birr/kg/qt.
9. Did you hire labor last year? 1= yes, 2= no

   If yes,

How many labors did you hire? (number)	Modes of hiring 1= daily basis 2= piece rate 3=	Times worked for you (Hours/day)	Labor wage (Birr/hour)	Was it easy to hire labor? (1= yes, 2= no)

10. Please state which additional inputs you were using last season.

    9.1 Fertilizers 9.3 Pesticides

    9.2 Herbicides 9.4 Other, specify _____

11. Did you get credit service last year? 1= yes (answer 10.1 to 10.7) , 2= no ☐

    11.1. Indicate your source of credit. ☐

    1. Bank 4. Local money lender
    2. Cooperative 5. Friends or relatives
    3. Merchant 6. others, specify _____

    11.2 For what purpose did you use the money? ☐☐☐☐

    (more than one option is possible)

1= to purchase inputs (seeds, etc) 2= for farm implements

3 = to transport maize to the different markets

4= others, specify _____

11.3 How much was the total amount of credit obtained? _____ (birr)

11.4 What was the duration of the credit? _____ (month).

11.5 How was the frequency of the repayment condition? ☐

1= monthly 3= annually

2= quarterly 4= others, specify _____

11.6 What was the interest rate (%) _____? ☐

11.7 Have you completed the repayment? 1= Yes 2= No.

12. Do you belong to any association? ☐

1= yes (specify_____) 2= no

12.1 If yes, how long have you been an association member? _____(years).

12.2 If yes, what kind of benefits/services do you get from the association in which you are a member? (more than one option is possible).

1= market information 2= provision of farm equipments 3= loan/credit

4= financial support 5= other, specify _____

13. Which means of transportation do you possess? ☐☐☐

1= Motor car 3= animal cart

2= Truck 4= Donkey 5= other, specify _____.

14. How much did you pay for the amount of inputs you need in one harvest season?

Inputs	Paid Labor	**Seeds (Maize variety)**		**Fertilizers**	**herbicides**	**Pesticides**	**Other inputs** ___	**Transport**	**Storage**	**Fees/taxes**	Other costs, specify, _____
Over all Cost, Birr/season											

15. Could you give us an estimation of your total costs to produce maize in one season?

From _____ to _____ birr/season.

Part III. Maize Marketing

3.1 Sales of maize last year (1999 E.C.)

3.1.1. Did you sale maize last year (1999 E.C.)? (1=Yes (**go to 3.1.2 to 3.1.7**); 2= No

3.1.2. What kind of maize product did you sell? ☐

1. Green maize 2. Dry maize 3. Both 4. Others, _____

3.1.2 Please indicate the months of high and low supply of maize. ☐

1. High supply season _____ to _____
2. Low supply season _____ to _____

3.1.3. What is the proportion of your total maize sales comparing to your total maize production? ☐

1. less than 50% 2. larger than 50%

3.1.4. To whom did you sell large volume of your maize during last harvest season? ☐

1. Directly to consumer 4. To rural collectors
2. To the wholesalers 3. To Retailers
5. 5. Others, specify ----------

3.1.5. Where did you sale large volume of your maize last year? ☐

1. at the wet market (Arada market or Bura local market)
2. at the farm gate/near to the farm.
3. at the wholesale market
4. at the retail market
5. others, specify _____

3.1.6 What was/were your reason/s to select this market channel? ☐

3.1 high price 3.3 fixed place 3.5 payment in time

3.2 proximity 3.4 no other way 3.6.others,specify_____

3.1.7 What was the price received from the chosen market channel? ☐

1, High supply season _____ birr/qt

2. Low supply season _____ birr/qt

3.1.8 Indicate the amount of sales, last year (1999 E.C.).

Amount sold at the wholesale market	Amount sold at the retail market	Amount sold to consumer at the wet market	Amount sold to assembl ers at the wet market	Total volume of sales	volume of self-consumpt ion	Total volume of waste
Kg/qt	Kg/qt	Kg/qt	Kg/qt	Kg/qt	Kg/qt	Kg/qt

Total maize production during last year _____ kg/qt

Total value of sale during last year _____ birr/qt

Proportion of maize sold to total maize production _____ %.

Part IV. Transaction Costs

4.1. Transaction costs- Information costs

4.1.1 Where did you get information about price and other market related issues? ☐☐☐

1. Television 3. Radio 5. Trader 7. Others, _____
2. Newspaper 4. Telephone 6. Neighbor

4.1.2 Describe how easy it is for you to get information about market and related issues.☐

1. very difficult 2. difficult 3. medium 4. very easy 5. easy

4.1.3. How many traders did visit you during last year? _____ (number)

4.1.4 How many traders did you visit to sell last year? _____ (number)

4.1.5 To how many traders did you sell maize? _____ (number)

4.1.6 Do you go to the market to learn price? (1= Yes, 2= No) ☐

4.1.7 Do you know your neighbor's price? (1= Yes, 2= No)☐

4.1.8 Number of days' delay in knowing price? _____ (days)

4.2. Transaction costs- Negotiation Costs

4.2.1 Is there a payment delay? 1= yes 2= no ☐

4.2.2 How far do you exert influence on the selling price (or agreement)? ☐

1. passively accepting price 2. little bargaining power
3. moderate bargaining power 4. nearly equal bargaining power
5. equally negotiating the price

4.3. Transaction costs- Monitoring Costs

4.3.1 How many times trader went to pay farmers? _____(number)

4.3.2 When does trader make payment? ☐

1. advance 2. at sale 3. delayed 4. others, specify _____

4.3.3 Did traders recognize maize quality? _____ 1= always 2= never

4.3.4 Did you make agreement with trader by document or oral? ☐

1. document 2. oral 3. no

4.4. Transaction costs- Transportation costs

4.4.1 What is the distance to the market? _____ (km)

4.4.2 How long does it take you to reach the market? _____ (hours)

4.4.3 What is the average condition of the road? 1= good 0= bad ☐

4.4.4 What is the type of transportation used? ☐☐☐

1. head loading 3. animal cart 5. pack animals
2. motor 4. bus 6. others, specify _____

4.4.5 Who usually organizes transportation of your maize produce? ☐

1. yourself 2. dealer 3. buyer 4. others, _____

4.4.6 How much was the cost of transportation to the market? _____ (birr/km)

4.4.7 How long does it require finishing one day sale? _____ (hours)

4.4.8 Did you know the Arada market price before you sold your maize? (1= yes; 2= no) ☐

5. Storage and Processing

5.1 Do you store maize after harvest? 1= yes, 2= no (why? _____) ☐

5.2 If yes, how/where do you store it? _____

5.3 Do you protect stored maize? 1= yes (how _____) 2= no ☐

5.4 Do you have possibilities to invest in processing? ☐

1= yes, specify_____ 2= no

5.5 Do you get any kind of support? ☐

1= yes, specify_____ 2= no

6. Which circumstances do constraint your maize marketing and processing business? ☐

1. lack of access to credit
2. lack of storage facilities
3. small size of land
4. Lack of information
5. Poor access to means of transportation
6. Failure of payment
7. no labor available
8. Others, _____

7. Did you encounter any sudden serious shock last year?

_____

_____.

8. Do you have any other comment? _____

Declaration

I, the undersigned, declare that this thesis is my original work and has not been presented for a degree in any other university, and that all source of materials used for the thesis have been duly acknowledged.

The examiners' comments have been dully incorporated.

Declared by:

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Date: 30/01/09

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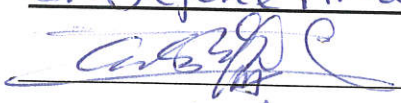
Signature: 

Date: 30/01/09

Place and date of submission: _____.