Structure and functioning of chickpea markets in Ethiopia: Evidence based on analyses of value chains linking smallholders and markets

Bekele Shiferaw and Hailemariam Teklewold*

Improving Productivity and Market Success (IPMS) of Ethiopian farmers project,
International Livestock Research Institute (ILRI), Addis Ababa, Ethiopia

* Corresponding author: b.shiferaw@cgiar.org
Postal address: ICRISAT, PO Box 39063-00623, Nairobi, Kenya

EIAR ICRISAT IPMS ETHIOPIA

Authors' affiliations

Bekele Shiferaw, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Nairobi, Kenya

Hailemariam Teklewold, Ethiopian Institute of Agricultural Research (EIAR), Debre Zeit, Ethiopia

Correct citation: Bekele Shiferaw and Hailemariam Teklewold. 2007. *Structure and functioning of chickpea markets in Ethiopia: Evidence based on analyses of value chains linking smallholders and markets.* Improving Productivity and Market Success (IPMS) of Ethiopian Farmers Project Working Paper 6. ILRI (International Livestock Research Institute), Nairobi, Kenya. 63 pp.

Table of Contents

List of Tables

List of Figures

Acronyms

DZARC	Debre Zeit Agricultural Research Centre
EFU	Erer Farmers Union
EIAR	Ethiopian Institute of Agricultural Research
EPOSPEA	Ethiopian Pulses, Oilseeds and Spices Processors and Exporters Association
ESE	Ethiopian Seed Enterprise
ICARDA	International Center for Agricultural Research in Dry Areas
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
ILRI	International Livestock Research Institute
IPMS	Improving Productivity and Market Success for Ethiopian Farmers
QSAE	Quality and Standards Authority of Ethiopia

Acknowledgements

This study is a product of a multi-institutional collaboration involving the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the Ethiopian Institute of Agricultural Research (EIAR) and the Improving Productivity and Market Success of Ethiopian Farmers (IPMS) project as the lead partners. We gratefully acknowledge the financial and logistical support provided by the IPMS project. ICRISAT provided additional financial support for completion of the study. We thank the IPMS team, especially Dirk Hoekstra, Berhanu Gebremedhin, Azage Tegegne and Nigatu Alemayehu, for their review and useful comments and suggestions that enhanced the quality of the study. We also thank Drs Solomon Assefa, Seid Ahmed, Kibebew Assefa, Dawit Alemu and other staff and scientists of EIAR for their support to this study and DZARC for providing logistical support during the survey. Several public and private agencies and partners provided valuable information that contributed to completion of this study. Undertaking a comprehensive value chain study for any commodity suffers from incomplete data as some respondents often refuse to provide the desired information. We thank all those traders who participated in the study and took their valuable time to give us the necessary data. The usual disclaimers apply.

1 Introduction

Ethiopia is one of the sub-Saharan countries of Africa which liberalized their economies and developed poverty reduction strategies that underpin market-led strategies for broad-based agricultural development and economic growth. The country has successively adopted economic reform programs that aimed to open up the agricultural marketing system for active participation of the private sector. The liberalization of the Ethiopian grain economy has undergone successive adjustments such as lifting of restriction on private trade, rejection of government trading monopolies, removing of official price setting (Dadi et al. 1992; Gabre-Madhin 2001). The centralized grain marketing activities of the 1980s where pan-territorial input and output prices were determined by the central government have given way to liberalized agricultural markets. Market liberalization means input and output prices are determined by market forces. It has substantially increased participation of the private sector in grain marketing. The current policy environment attempts to promote production and marketing of high value agricultural products with a view to increase competitiveness in domestic, regional and international markets. This is because markets for agricultural products are changing rapidly with different market participants expanding rapidly in controlling the emerging market opportunities. In addition markets are changing in response to changing consumption behaviour towards high value agricultural products induced by rising per capita income, migration, urbanization and globalization.

While the agricultural development policy of Ethiopia is designed to support market-led agricultural development, competitiveness of smallholder producers and commercialization of small-scale production depends on the development of viable and remunerative market linkages. Competitiveness in global markets is particularly important for exportable (tradable) high value crops and livestock products. Some of the major factors that limit competitiveness and lead to market imperfections are related to high marketing costs resulting from high transaction costs and poor market infrastructure, low marketable surplus and poor quality products that do not meet market preferences (de Janvry et al. 1991; Minten 1999; Fafchamps 2004; Fafchamps and Gabre-Madhin 2006). Global markets also demand consistent supply of higher quality products to meet new standards for food quality and safety that increase the comparative advantages for large-scale commercial farmers, processors and supermarket chains. Small- and medium-scale operators and smallholder farmers that supply them find it difficult to penetrate and exploit international markets which require value added products, in situations where local capacity and participation in the value addition process is limited by insufficient innovative product development and diversification to meet market requirements. The full exploitation of opportunities presented by these markets will require development of

innovative market linkages and addressing specific consumer needs and diversification of agricultural products.

This means that while the removal of trade barriers and increased competition has opened some flexibility for farmers to choose buyers for their products and suppliers of key inputs, the structure and performance of emerging rural markets remains to be a concern for accelerated commercialization of smallholder agriculture. High transaction costs and problems of asymmetric information continue to bedevil smallholder farmers, especially those with poor access to markets for products, inputs and services. Along the market and value chain, processors and traders are constrained by low quality grain, inadequate supply and high cleaning costs whereas market intermediaries in the supply chain face high assembly costs, high market risk and cash flow problems. These factors deprive farmers the underlying incentives to produce and supply quality and differentiated products with desirable market traits in addition to their inability to penetrate high value niche markets (Jones et al. 2002). This indicates that small-scale farmers growing low quality products are unlikely to exploit market opportunities as they cannot attain the required grades and standards and achieve the necessary economies of scale in competitive markets. This reduces their ability to compete with well established large scale producers and commercial farmers in more-favoured areas with better market infrastructure to harness available and emerging market opportunities (Kydd and Dorward 2004; Poulton et al. 2006; Shiferaw et al. 2006). Underdeveloped market linkages and problems of low economies of scale and high transactions costs often push smallholder farmers to sell their small marketed surplus at the farm-gate with lower prices (Fafchamps and Hill 2005; Shiferaw et al. 2006).

One of the key policy questions therefore is better understanding of how rural grain markets function in the context of market liberalization and how the emerging architecture of marketing channels determines the distribution of costs, margins and prices for different participants in the marketing chains. We explore these issues using the case of chickpeas, one of the newly emerging export commodities being promoted for expansion in Ethiopia (Shiferaw et al. 2007). Grain legumes like chickpea, lentils, peas and beans (of different types) are the third most important export crops in the country after coffee and oil crops. Pulse export increased from 66.2 thousand tonnes to 73 thousand tonnes from 2002/03 to 2003/04, making the sector an important alternative source of foreign exchange to the country (Table 1). In addition, income from the pulse products grew from USD 20 million to USD 22.6 million during the same period.

Table 1. *Major export products (2001–04)*

Commodity	2001/02	2002/03	2003/04
Pulses			
Value (USD × 10^6)	32.9	20.0	22.6
Volume (× 10^3 t)	109.2	66.2	73.0
Price (USD/kg)	0.3	0.3	0.3
Coffee			
Value (USD × 10^6)	163.2	165.2	223.6
Volume (× 10^3 t)	110.3	126.1	159.7
Price (USD/kg)	1.5	1.31	1.4
Oil crops			
Value (USD × 10^6)	32.6	46.1	82.7
Volume (× 10^3 t)	76.6	83.0	106.0
Price (USD/kg)	0.4	0.6	0.8

Source: Custom Authority and NBE (2007).

Despite its important role and good potentials, the chickpea production system is not adequately market-oriented and competitiveness of smallholders is limited by low productivity and poor quality of traditional varieties (Shiferaw et al. 2007). Despite the policy interest to expand chickpea production for exports, there is lack of empirical evidence on the structure, conduct and performance of the chickpea marketing systems in the country. This study attempts to narrow this gap by examining the chickpea marketing system in one of the major growing areas and provides new insights on how the performance of the marketing system may be enhanced to improve competitiveness. Using primary data collected from a survey of marketing channels in one of the major chickpea growing areas in the country (Ada'a-Liben), we map the marketing channels and value chains for chickpeas and estimate the distribution of costs, margins and prices for the different participants in the identified value chains.

The remainder of the paper is organized as follows. The next section presents the conceptual issues in the analyses of marketing channels, value chains and measurement of marketing costs. This is followed by description of the study area, the survey data and the empirical approach and methods used in the analysis. Section 5 presents the main result with emphasis on identification and mapping of chickpea marketing channels and the distribution of costs, margins and prices across different market participants. Section 6 presents a summary of the key findings and conclusions, highlighting implications for policy.

2 Conceptual framework

Value chain analysis examines the full range of activities required to bring a product or service from its conception to its end use, the firms that perform those activities in a vertically coordinated chain and the final consumers for the product or service. The activities include design, production, marketing and support to get the final product or service to the end consumer (Kaplinsky and Morris 2000). Value chain analysis is sometimes used interchangeably with subsector analysis. If a subsector analysis is conceived as examining all the firms, channels and markets related to a specific product or service, a value chain analysis is focusing on a single vertical chain of firms leading to a particular consumer market that could be considered to be complementary to subsector approach. However, a value chain analysis often includes additional analytical elements beyond subsector analysis such as inter-firm cooperation, governance and geographic coverage that extends to global markets. Some analysts also make useful distinctions between supply chains and value chains. Hence, a supply chain is defined as a set of linkages between actors where there are no binding market relationships while the concept of a value chain refers to a particular type of supply chain where actors actively seek to support each other to improve systemic efficiency and competitiveness (KIT, Faida, MaLi and IIRR 2006).

In this study we adopted a broader concept of a value chain to assess the constraints and opportunities that underpin the chickpea marketing systems in Ethiopia. We assess the structure and functioning of markets and trade to identify key constraints and weak linkages in the chickpea value chains. We deal with marketing arrangements under imperfect markets where linkages among actors are underdeveloped and asymmetric information and mistrust are pervasive. Therefore, the strict definition of value chains is not adopted and we use market chains interchangeably with value chains.

The total variable costs of producing and marketing chickpea entail standard production costs, marketing costs and transaction costs. According to the new institutional economics, transaction costs include the costs of identifying, negotiating and concluding an exchange (Nabli and Nugent 1989; Hubbard 1997). These costs may be decomposed into three types of transaction costs. First, information costs which are the costs encountered prior to the transaction and include costs related to searching for and screening potential trading partners. Second, negotiation costs which include the costs of arranging the trade, drawing the terms of exchange and reaching an agreement on exchange. Lastly, enforcement costs which include the costs of monitoring and enforcing compliance with the terms of exchange, as well as *ex post* mal-adaptation costs (Randolph and Ndung'u 2000).

Transactions costs could arise at the production level in the case of finding input suppliers, negotiating the terms of purchase and verifying the quality of input and the sale price. It can also arise from asymmetric information in the process of acquiring credit and hiring labour which requires monitoring and supervision of hired workers. At the marketing level, transaction costs arise in the process of finding a buyer, negotiating the sale price, verifying the quality of product and reliability of weights. These production and market level transaction costs are exacerbated by incomplete information, geographical spread of the farmers, frequency with which exchange takes place and the degree to which the assets needed to complete the exchange are specific to the transaction.

The marketing of commodities typically involves many intermediaries: assemblers, wholesalers, retailers, and the ultimate end users (i.e. consumers). The performance of the marketing system of any commodity depends on the organization of its marketing channels. In particular, the number of actors involved and the degree of coordination and information sharing within the channel will determine the marketing costs and margins.

3 Chickpea economy and study area

3.1 Chickpea production

Chickpea is one of the major pulses grown in Ethiopia, mainly by subsistence farmers usually under rain fed conditions. It is one of the main annual crops in Ethiopia both in terms of its share of the total cropped pulse area and its role in direct human consumption. It is grown widely across the highlands and semi-arid regions of the country (Bejiga et al. 1996). The total cultivated area of chickpeas increased from 140,244 ha to 167,569 ha between 2002/03 to 2004/05, but the national average yield remains less than 1 t/ha (CSA 2006), indicating limited adoption of new high-yielding and stress tolerant varieties. The crop provides an important source of food and nutritional security for the rural poor, especially those who cannot produce or cannot afford costly livestock products as source of essential proteins. The consumption of chickpea is also increasing among the urban population mainly because of the growing recognition of its health benefits and affordable source of proteins. In the export market, chickpea contributes a significant portion of the total value of pulse exports. For example, chickpea constituted about 48% of the pulse export volumes in 2002. During this period of time, the exported volume accounts about 27% of the total quantity of chickpea production while the balance remains for domestic market (Shiferaw et al. 2007).

Two types of chickpea, Kabuli and Desi, are currently produced in Ethiopia. Kabuli or garbanzo type is usually large seeded with seed size ranging from 6–8 mm and smooth cream white seed coat colour. The production of Kabuli types is currently limited to few pockets, primarily in Eastern Shewa region where access to improved varieties has been promoted through better linkages with the research and extension system. Desi type chickpea, traditionally widely grown in the country, is small seeded with seed size ranging from 3–6 mm, and hard and reddish-brown coloured seed coat. Research to improve the productivity of chickpea has been conducted for more than 30 years mainly at Debre Zeit Agricultural Research Center (DZARC), located in Ada'a-Liben *woreda*, some 50 km east of the capital, Addis Ababa. Several new Desi and Kabuli type chickpea varieties have been developed through collaborative research programs involving ICRISAT and ICARDA (Shiferaw et al. 2007). Most of the improved chickpea varieties with their appropriate agronomic practices have been demonstrated to farmers particularly in the neighbouring districts *(woredas)* such as Ada'a-Liben, Akaki and Gimbichu for further diffusion of the technologies. Although these *woredas* are well known for their production of Desi type chickpeas, they also constitute leader farmers in the production and marketing of high-value improved Kabuli type chickpeas. However, recent study

in these *woredas* indicated that on average only about 5% of farmers have adopted any of the improved chickpea varieties (Dadi et al. 2005). Taken together, this implies the available high yielding varieties with market preferred traits have not fully reached farmers.

3.2 Study area

The Ada'a-Liben *woreda* was selected for this study for two reasons:

(a) It represents one of the major chickpea growing areas in the country where new varieties (especially Kabuli types) are beginning to be adopted by farmers and market linkages with other chickpea neighbouring districts (Akaki, Gimbichu and Lume) and other areas are relatively well developed;

(b) The *woreda* represents one of the 10 pilot *woredas* selected under the IPMS project for piloting institutional innovations to enhance commercialization of smallholder agriculture in Ethiopia.

Farmers in the *woreda* are largely organized under farmer cooperatives, which facilitate access to market information, fertilizer and improved seeds and provide marketing services for chickpea and other marketable crops. The primary cooperatives from adjoining *woredas* joined together and formed the Erer Farmers Union (EFU). Hence, Ada'a-Liben is one of the three *woredas* (Ada'a-Liben, Akaki and Gimbichu) that constitute EFU, located in Debre Zeit town.

The EFU has received breeder and pre-basic seeds from DZARC and Ethiopian Seed Enterprise (ESE) for several Kabuli type chickpeas (e.g. Shasho, Arerti and Chefe) for further multiplication using a selected group of contracted farmers. The improved seed is then marketed back to member farmers. While alternative seed production and marketing systems are still being investigated, this linkage with the research systems and ESE has facilitated the uptake of new varieties and increased the marketed surplus of chickpeas. The international market prices for Kabuli chickpeas is directly correlated with the size of the grain, with a high preference for chickpeas with more than 8 mm in size. Competitiveness of Kabuli exports would therefore depend on the available Kabuli varieties. Despite the increased availability of improved Kabuli varieties in the last few years, the size of the varieties that reached farmers is still quite small (6–8 mm) (Shiferaw et al. 2007).

In terms of market access, Ada'a-Liben *woreda* is located along the main road linking Addis Ababa and Nazareth, making it generally well linked with the main markets in both cities. The capital of the *woreda*, Debre Zeit town, also lies on this major highway and offers good market opportunities to the farmers in the *woreda*. The *woreda* has also

a good marketing network with the surrounding *woredas* such as Gimbichu, Akaki and Lume. For Kabuli chickpeas, access to market is further facilitated through EFU, which provides joint marketing services for the grain collected from farmers through the primary cooperatives.

The elevation of the *woreda* ranges from 1900–2200 metres above sea level, and the area receives 870 mm annual average rainfall. The chickpea crop is mainly grown at the end of the rainy season (September to December), mainly using the residual moisture in black soils (Vertisols). About 90% of the *woreda* belongs to the subtropical agro-climatic zone, making it suitable for chickpea production including the Kabuli types. The single major soil type—Vertisol—covers about 60% of the *woreda*. The major crops in the farming system are wheat, teff and chickpeas. Chickpea is the third most important crop in the *woreda* (after teff and wheat) in terms of area grown both as source of cash and for household consumption. Chickpea is produced under small-scale production systems on small plots, largely ranging from 0.25 to 0.3 ha. As a Nitrogen fixing crop, chickpea improves soil fertility and farmers exploit these synergies through systematic crop rotations with cereals. Along with chickpeas, lentils are also becoming important pulses in Ada'a-Liben and the surrounding *woredas*.

Recent data from the *woreda* agricultural offices indicates that about 4% of the total cultivated area during 2005/06 in Ada'a-Liben is allocated to chickpeas. This is significantly higher than in the other surrounding *woredas* (e.g. Gimbichu). The estimated total production from the *woreda* is about 112 t. Despite the enhanced efforts in expanding the availability of improved cultivars, the data seems to show that much of the chickpea area is still under local (Desi type) chickpea varieties. The area under improved varieties is highest in Akaki *woreda* where farmers seem to have better access to seeds and output markets (Table 2).

Table 2. *Area and production of chickpea in Ada'a-Liben and surrounding* woredas

Area and production	Ada'a-Liben		Akaki		Gimbichu	
	2005/06	2006/07	2005/06	2006/07	2005/06	2006/07
Total cultivated area (ha)	79,981	79,981	44,558	44,558	40,304	40,320
Total chickpea area (ha)	4346	4938	6070	5963	2008	1984
Improved chickpea area (%)	4.2	2.8	85.0	85.0	73.7	67.5
Local chickpea area (%)	95.8	97.2	15.0	15.0	26.3	32.5
Total chickpea production (qt)	112,996	158,559	166,014	152,955	49,984	47,616
Improved chickpea production (%)	4.5	3.1	90.1	89.5	79.9	78.4
Local chickpea production (%)	95.5	96.9	9.9	10.5	20.1	21.6

The local prices for Desi and Kabuli chickpeas in the *woreda* have generally increased over time. This can be noted from the long-term (2001–07) weekly price monitoring data collected in Debre Zeit town by DZARC (Figure 1). Despite the high seasonal price variations, which is more pronounced for Kabuli than Desi chickpeas—the nominal prices have increased from less than Ethiopian birr (ETB)[1] 150/qt in 2002 to over ETB 450/qt for Kabuli and ETB 400/qt for Desi chickpeas in 2007. The price of Kabuli hit a historical maximum of about ETB 530/qt while the Desi price rose to ETB 450/qt in early 2007 and collapsed back to about ETB 400–420/qt in mid 2007. The dramatic rise in the chickpea price seems to have been largely driven by the increased export demand which started during 2005 and lately fuelled by unrealistic price expectations from farmers and traders. However, this seems to have induced high adoption of improved varieties as is evidenced by the increased demand for improved seeds.

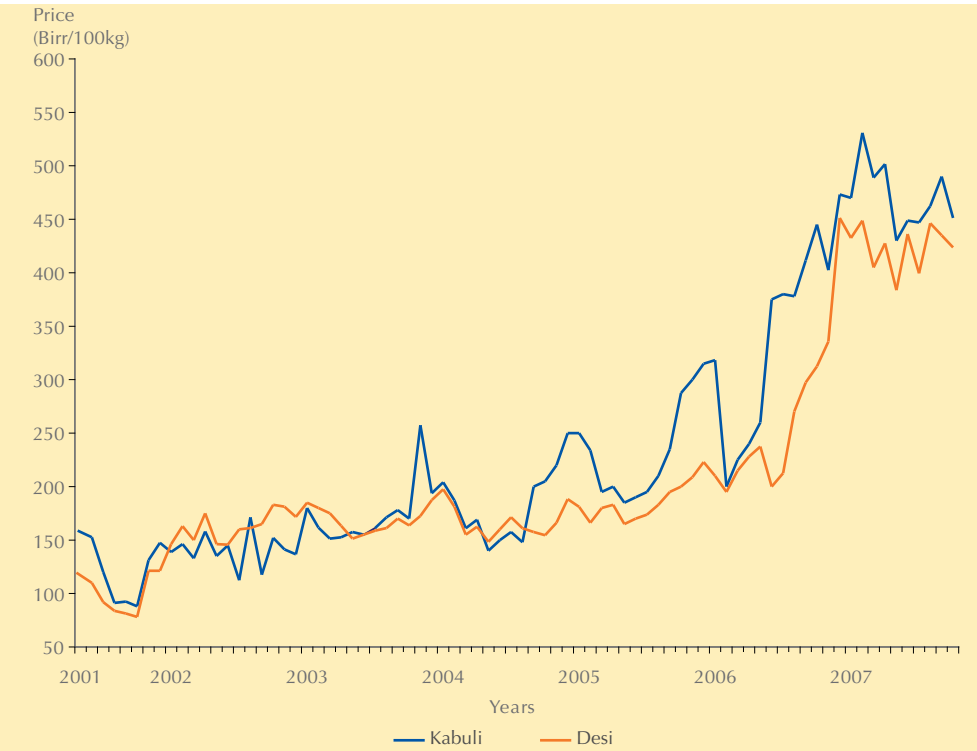


Figure 1. *Weekly Kabuli and Desi prices at Debre Zeit market (2001–07).*

1. In November 2007, USD 1 = Ethiopian birr (ETB) 9.0864.

4 Data and methods

This structure and functioning of chickpea markets was investigated using Ada'a-Liben *woreda* as the focal reference point in tracing the relevant marketing channels and actors involved, and prices and transaction costs in the chickpea marketing system. A survey was conducted along the value chain that links producers in the primary markets with domestic consumers and exporters in tertiary markets (Addis Ababa and Nazareth). As key marketing reference points, nine major rural markets in the *woreda* were identified and included in the survey. This included the following key markets dotted around the major chickpea growing areas of the *woreda*:

- Godino — Monday market
- Tulu Dimtu — Friday market
- Hidi — Tuesday market
- Dire — Monday market
- Bekejo — Tuesday market
- Adulala — Saturday market
- Wonber — Thursday market
- Denkaka-ude — Road side market
- Dukem — Thursday market

At the secondary market level, the survey included several wholesalers (including the EFU) and retailers in the *woreda* town (Debre Zeit). The survey extended to the major markets linked to the *woreda* and included Addis Ababa and Nazareth as tertiary chickpea markets. Table 3 shows the sample size, the number of traders and the relative market shares of chickpea traders (in each market) included in the survey. The survey included 68 traders in the primary markets, 13 traders in secondary markets and 41 traders in tertiary markets in Addis Ababa and Nazareth. As indicated in Table 3, the average number of assemblers operating in the nine primary markets surveyed in Ada'a-Liben is about 37; but the average share of the surveyed assembler in each of the surveyed markets is about 9%. All the 14 primary cooperatives dealing with chickpeas were included, but there was no information on the share of each cooperative in the primary market. The survey also included nine of the 27 wholesalers in Debre Zeit town and the average stated share of the surveyed trader is about 26%, showing that most of the larger traders were included in the survey. Similarly, the survey included 9 wholesalers in Nazareth and in Addis Ababa, but the total number of chickpea wholesalers operating in each of these markets was about 43 traders. The average share of the sample trader in the particular market was estimated at about 21%, again indicating the high relative size of the sample traders among the population of similar traders in this market.

Table 3. *Average number of market participants and their relative share in chickpea marketing*

Market type	Type of trader	No.	No. of chickpea traders of same type in the particular market	Share in total volume of chickpea traded in this market (%)
Primary (village)	Assembler	27	37	9.00
	Retailer	27	37	4.30
	Primary cooperatives	14	14	–
Secondary (Woreda level)	Wholesaler	9	27	26.11
	Retailer	3	16	15.00
	Union	1	1	100.00
Tertiary (urban level)	Wholesaler	9	43	21.61
	Retailer	8	16	12.20
	Supermarket	8	8	22.83
	Processor	7	10	16.88
	Whole grain exporter	7	14	25.17
	Processed grain exporter	2	6	7.00

In each of the identified markets along the marketing chain, information was collected using a formal survey instrument during March to June 2006. Trained enumerators administrated the survey of assemblers, retailers, and wholesalers in the primary and secondary markets in Ada'a-Liben *woreda*, while trained economists collected the information from exporters, processors, supermarkets and others in the tertiary markets. The survey instrument was specially designed to track the alternative channels used in chickpea transactions and to capture the associated prices, volumes, and transaction costs in the source and sink markets along the value chain. Data collected included information on chickpea marketing operations, the number and relative importance of various participants in terms of volume of flow; the profile of market participants and the level of their participation; the flow of information on production and market conditions; the degree of partnership and relationship between buyers and sellers; frequency of transactions; the points of transaction in grain buying and selling; quantity and quality of the traded grain or product; seasonality of transactions; the cost of grain handling, cleaning and processing; marketing costs and margins; and information on perceived strength and weakness of the chickpea business operation. In addition to this primary data, the study uses field visits and qualitative data collected from traders through informal discussions and secondary information gathered from alternative sources.

Marketing costs were taken to include both transaction costs and standard marketing costs (e.g. transport, assembly, grading/sorting). Measured transaction costs included the reported costs of finding a buyer/seller, costs of monitoring/inspecting the quality of

grain being traded, and the costs of negotiating prices and ensuring quality standards and agreed volumes. The standard marketing costs considered in this study included the costs of assembling the produce, grading/sorting, transportation, and storage, among others. Lack of detailed data prevented us from computing each of these costs separately.

The estimation of participants' net marketing margins was therefore stated as marketing margin less total costs (Mendoza 1995), i.e.:

$$\textit{Net marketing margins} = \textit{Marketing margin} - \textit{Total costs} \quad (1)$$

$$\textit{Gross marketing margin} = \textit{Selling price} - \textit{Buying price} \quad (2)$$

$$\textit{Total cost} = \textit{Standard marketing costs} + \textit{Transaction costs} \quad (3)$$

The direct marketing costs included costs paid for assemblers (agents), labour to clean the grain, and costs of storage, loading and offloading, processing, packaging, and custom clearing and bank charges (for exporters). Most of these costs have associated indirect or implicit costs in completing transactions. For instance, the cost of assembling produce in the rural areas is a standard marketing cost. However, it entails searching for a seller, negotiating the price and inspecting the quality of the produce offered for sale, which are all components of transaction costs. Likewise, transportation cost (which is standard marketing cost) often encompass costs of inspecting that the consignment received has same weight, volume and content as the one sent (which are transaction costs). Despite the difficulties in disentangling these costs, an attempt was made to elicit the direct cash outlays as well as the indirect costs in terms of time used and cost of phone calls made to acquire information, search buyers/sellers, negotiate and conclude transactions.

The identified marketing channels are mapped to show the complexity of the marketing structure and to determine the different actors involved and the strength of the linkages in the value chain. The distribution of costs, margins and prices across the different actors is calculated by tracking changes in prices and costs as the commodity moves along the value chain linking the producer with end users and consumers. It is generally hypothesized that any good is valued for its utility generating attributes where purchasers evaluate product quality attributes when making a purchase decision (Rosen 1974). Hence, the observed market price is the sum of the implicit prices paid for each quality attributes. However, in most empirical studies, the observed price may reflect not only consumer preferences but also attributes of buyers and sellers (Parker and Zilberman 1993; Shiferaw et al. 2006). Therefore, the market price of chickpea is the sum of the

prices purchasers are willing to pay for each characteristic that enhances utility and the characteristics of markets, sellers and buyers.

We use a hedonic type price determination model to identify the role of chickpea quality parameters and the characteristics of markets, sellers and buyers to the observed price of chickpeas along the market chain. The price function for chickpea can then be described as a function of qualitative and quantitative variables as:

$$P = f(X, Z) + e \quad (4)$$

where, P is the observed price of chickpea
X is a set of covariates (quantitative factors)
Z is the set of discrete (qualitative) factors
e is the error term

The search for alternative functional forms indicated that a logarithmic specification would be a better fit for the data in estimating the regression parameters:

$$\ell n P = \alpha + \beta \ell n X + \delta Z + e \quad (5)$$

In this format, the coefficient of the continuous variables represents the elasticities for the logarithmic variables. On the other hand, the estimated parameters of the qualitative characteristics measure the impact of the presence or absence of the discrete indicator variables. For these dummy variables the elasticities are computed as: $\varepsilon_i = 100[e^{(\delta_i - 0.5 \text{ var } \delta_i)} - 1]$. The interpretation of these elasticity values is the relative change (percentage change) in the dependent variable per unit change in the independent variable (Garderen and Shah 2002).

5 Results and discussion

5.1 Socio-economic profile of chickpea traders

The socioeconomic profile of the traders involved in chickpea trading is presented in Table 4. Information on asset ownership and experience in grain trading business are presented in Tables 5 and 6. A significant share of the chickpea businesses in the primary and secondary markets are run and managed by family workers; about 79% of the businesses in the primary and 86% of those in the secondary markets have at least one full time family worker, while 20 and 14% primarily rely on hired workers, respectively. This compares with about 42% having at least one full time family worker in the tertiary markets and about 17% who do not have any family workers. None of the businesses in the primary and secondary markets have more than one full time family worker. About 40% of the businesses in the tertiary markets have more than one full time family worker, but only 10% had more than three workers. This shows the small-scale nature of these grain trading businesses both in terms of the volume of trade and the amount of financial and human capital needed to run them.

Table 4. *Characteristics of chickpea traders (% of respondents)*

Variables	Units	Market type			Total (N = 122)
		Primary (N = 68)	Secondary (N = 14)	Tertiary (N = 40)	
Family workers in the business (full time equivalent)	0	20.6	14.3	17.5	18.9
	1.0	79.4	85.7	42.5	68.0
	2.0	0.0	0.0	15.0	4.9
	3.0	0.0	0.0	15.0	4.9
	4.0	0.0	0.0	2.5	0.8
	5.0	0.0	0.0	7.5	2.4
Non-family workers (permanent full time equivalent)	0	79.4	15.4	34.1	57.4
	1–5	20.6	76.9	17.1	25.4
	6–25	0.0	7.7	22.0	8.2
	26–250	0.0	0.0	22.0	7.4
	>250	0.0	0.0	4.9	1.6
Sex of the respondent (%)	Male	66.2	100.0	90.0	77.9
	Female	33.8	0.0	10.0	22.1
Education level of the respondent (%)	Illiterate	14.7	0.0	4.9	9.8
	Elementary (1–4)	25.0	7.7	9.8	18.0
	Junior secondary (5–8)	11.8	38.5	12.2	14.8
	Secondary (9–12)	47.1	46.2	34.2	42.6
	College/ university	1.5	7.7	39.0	14.8
Role in enterprise	Owner manager	79.4	85.7	55.0	72.1
	Hired manager/ employee	20.5	14.2	45	27.9

Table 5. *Ownership and access to communication and other assets (% of respondents)*

Items	Market type			Total
	Primary	Secondary	Tertiary	
Communications				
Radio	72	92	34	61
Telephone	29	100	100	60
TV	13	85	32	27
Computer	0	8	49	17
Internet	0	8	46	1
Fax	0	8	39	14
Warehouse				
None	71	8	34	52
Owned	26	31	27	27
Rented	3	54	22	15
Both	0	8	17	7
Weighing scale				
0.00	66	15	22	46
1.00	15	46	37	25
>1	19	38	41	29

Table 6. *Experience in grain business*

	Primary	Secondary	Tertiary	Total
Years of experience in chickpea trading	5.53 (3.44)	7.64 (4.33)	9.56 (12.28)	7.09 (7.79)
Years of experience in other crops trading	5.72 (3.28)	7.93 (4.10)	12.29 (11.79)	8.13 (7.85)

Figures in parenthesis represent standard deviation.

The available data also shows that about 21% of the traders in the primary markets, 77% in the secondary markets, and 34% in the tertiary markets maintain up to five fulltime non-family employees to run the business. However, none of the surveyed traders in the primary markets had more than five hired employees. This compares with about 8% of the traders in the secondary markets and about 50% of those in the tertiary markets who had more than five permanent employees. Some of the larger traders and processors (e.g. East Africa and Fafa) have more than 250 permanent employees, while the Ethiopian Grain Trade Enterprise has more than 1500 employees.

In terms of the gender balance, about 66% of the businesses in the primary markets were either owned or managed by male workers, while female workers account for the remaining balance (34%). The share of the female managers/owners declines substantially as one moves from the primary to the secondary and tertiary markets. This may be a reflection of the capital and other entry barriers that may particularly affect

female traders as the volume of trade and degree of specialization increases. This seems to pick up slightly in the tertiary markets as some of the *baltinas* and mini-markets are managed or owned by females. As far as the educational level of the managers or owners is concerned, the survey results indicate that on average 10% of the traders were illiterate with this value ranging from 5% in tertiary markets to 15% in primary markets. Interestingly, all the traders in the secondary markets were found to be literate. The most educated traders were found in the tertiary markets where up to 15% had a university level education. In all the three markets, about 43% of traders were found to have secondary level of education (Table 4).

Ownership and use of essential assets and facilities for the trade enterprises vary across traders in the different markets along the value chain. For instance, radio seems to be most important for accessing market information in the primary and secondary markets than in the tertiary markets (Table 5). About 72% of the traders in the primary and 92% of those in the secondary markets own a radio. On the other hand, the use of high-tech communication (computer, internet and fax) is more important in the tertiary markets. While about 8% of the traders in the secondary markets have access to these assets, about 40–48% of traders in the tertiary markets own a computer and/or have access to internet resources. Interestingly, less than a third of the traders in the primary rural markets have access to the phone, indicating the difficulties in accessing mobile networks. This proportion is likely to fall significantly as the coverage and ownership of mobile phones increases in the rural areas.

When we look at ownership of warehouse facilities about 70% of the traders in the primary markets and 8% in the secondary and 34% in the tertiary markets do not own any storage facilities. The proportion of warehouse ownership seems to vary from 26 to 30% among the different markets. However, less than 3% of those in the primary markets had rented a warehouse, which compares with about 54% in the secondary markets and 22% in the tertiary markets. About 17% of the traders in the tertiary markets reported that they have access to a rented facility while they also have their own storage. The quality of warehousing facilities is generally poor except for few traders (exporters and processors and the farmers union) who own relatively well maintained and equipped warehouses. About two-thirds of the traders operating in the primary markets do not own a weighing scale. Most of these traders serve as agents of the wholesalers based in the secondary and tertiary markets, hence they use weighing scales provided by their contractors. About 15% of those in the secondary and 22% in the tertiary markets do not also own a weighing scale—indicating that rental of weighing scales is also not uncommon for these groups of traders (Table 5).

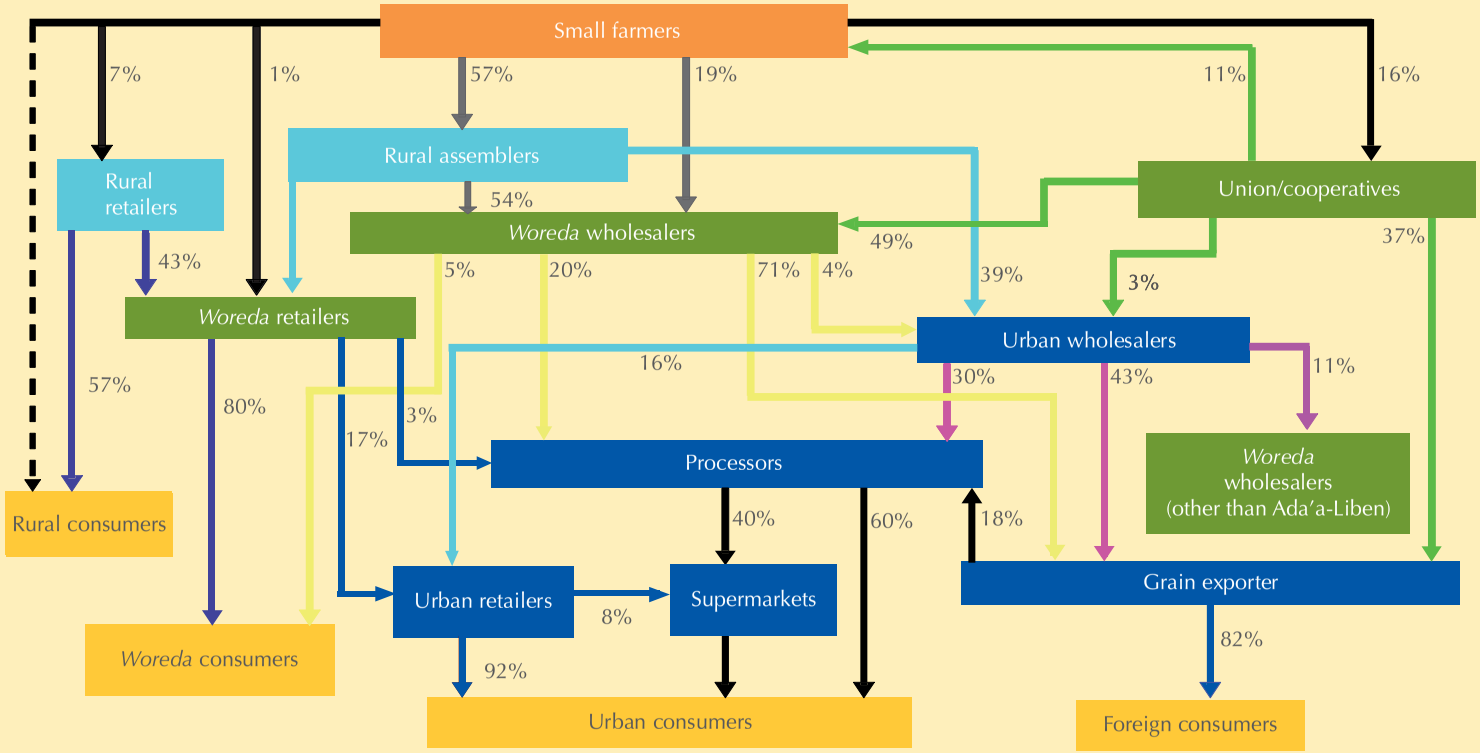
The study also found that among the sampled traders, none of the traders in any of the markets specialized on the chickpea business alone. In addition, traders in all markets expressed that they get into the chickpea marketing business after they have earned some experience in other grain marketing activities. As in the case of educational skills, the level of experience in chickpea marketing increases as the volume of trade and level of sophistication increases from the primary to tertiary markets. This shows that as traders accumulate capital and essential experience, they tend to climb the ladder—moving from the primary rural markets to tertiary urban markets. It was also observed that about 18% of traders in the tertiary markets had more than 20 years of experience in chickpea business (Table 6).

5.2 Market structure and functions of different participants

The analysis of marketing channels is intended to provide a systematic knowledge of the flow of goods and services from their origin (producer) to their final destination (Scott 1995). Marketing of chickpea generally starts with the collection of grains from the farm-gate and village markets (primary markets) moving on to the *woreda* towns (secondary markets) and then on to terminal markets in the cities. In the marketing chain the product passes successively through a number of market actors (representing the links in the value chain) before it reaches the end user (Figure 2). Shiferaw et al. (2007) described the market structure and the different market participants in the chickpea value chain and their primary operations. The main actors include a network of assemblers, retailers, wholesalers, farmers union, exporters, and processors operating at different levels in the value chain. The behaviour and functional role of the different participants in determining the structure and performance of the chickpea marketing system is described below.

Assemblers

In chickpea marketing activities, rural assemblers play an important role in collecting grain from smallholder producers at primary markets and deliver the grain to wholesalers at different levels. In most cases, these actors are independent operators who use their own financial resources and their local knowledge to bulk chickpea and other grains from the surrounding area and transport the grains using pack animal and trucks for sale in secondary and tertiary markets. To some extent, wholesalers often place orders with trusted assemblers. Once the desired or available quantity of chickpea has been collected, the assemblers deliver the product to their buyers, who invariably arrange their own transport. The assemblers often receive cash advances to fund their activities. Gebremeskel et al. (1998) noted that although the assemblers typically operate independently, they may also act as agents for wholesalers on a fixed-fee or commission basis.



*Numbers in the diagram represent proportion of chickpea flow to the next channel.
▬ ▬ ▶ We expect this channel but unable to find from this study.
Figure 2. *Marketing channels and value chains of chickpea grain.*

Wholesalers

Broadly, there are two types of wholesalers in chickpea marketing business. These are wholesalers at *woreda* level towns and wholesalers operating at the terminal markets including the parastatal, the Ethiopian Grain Trade Enterprise (EGTE). Previously, wholesale chickpea trade was largely controlled by the public enterprises, mainly by the Ethiopian Oilseeds and Pulses Exporting Corporation. However, following the liberalization of grain market system in the 1990s, the role of public enterprises significantly diminished and the role of private wholesalers increased (Negassa and Jayne 1997). Survey results indicated that wholesale markets both at the secondary and terminal levels are the main assembly centres for chickpea grains in their respective surrounding areas. These markets have better storage, transport and communication access than the rural markets. Almost every trader has a warehouse in the market either self owned or on a rental basis. There is also an easy access to transport, which makes it well-located both for producers and other traders to move chickpea grain from one market to the others. Almost all wholesalers have at least one cellular phone, highly beneficial in conducting their buying and selling activities through a range of contacts they have in different markets.

Usually, speculative storage to benefit from inter-seasonal price movements is rarely practised because of poor liquidity and high storage risks. Chickpea transaction from the *woreda* level wholesalers to urban wholesalers, processors and exporters is usually facilitated by arbitrage of brokers so as to coordinate inter-market chickpea flow usually based on trust. Similar to other grain marketing practices in Ethiopia, brokers identify chickpea buyers, sell chickpea on behalf of *woreda* level wholesalers and collect and send back money from the sale of chickpea. The market intermediaries communicate market information back to their clients on a regular basis.

Farmers Union

Erer Farmers Union is the only union involved in chickpea and other grain trading in Ada'a-Liben *woreda* and other adjacent *woredas*, Akaki and Gimbichu. Basically, so far EFU's intention in chickpea is to maintain adequate Kabuli chickpea needed to satisfy the seed requirement of farmers in these *woredas*. For this, the union provides Kabuli seed to the farmers and collected the harvested grain with premium price through its network of primary cooperatives in the three *woredas*. Recently, the union has started selling grain to wholesalers and exporters. For qualification purposes the union has classified Kabuli chickpea into three types, namely Philip (8–9 mm), Shasho (7–8 mm) and Arerti

(6–7 mm). This is a good strategy in terms of differentiating the product using the most important factors that affects international chickpea prices for Kabuli types.

Retailers

The majority of chickpea retailing both in urban and rural areas is characterized by non-specialized activities, which sell small quantities of diverse quality grains. In domestic consumption, retailers play an important role in chickpea marketing business by delivering the grain to the final consumers. As far as chickpea marketing outlet options is concerned, village level retailers operate only in local areas while *woreda* level retailers operate their business transactions mainly at the *woreda* market. Almost all of the retailers at tertiary markets sell chickpea only in the urban market, but about half of the sampled urban retailers collect chickpea grain from at least one market in Ada'a-Liben *woreda*.

Processors

In the tertiary market, there are few large scale and medium level mills that process chickpea. Two large scale processors, East Africa and Green Star are located in Ada'a-Liben *woreda*. Most of the large scale processors need Desi type chickpeas. However, the newly established canning factory, Green Star Food Company, also requires Kabuli chickpea for processing. This is expected to be a good market opportunity for farmers in the surrounding area to increase Kabuli production. Another processing plant located at the outskirts of Dukem town in Akaki *woreda* is Arba and Tryaki Grain and Pulse Industry currently using lentils, grass pea (*Lathyrus sativus*) and Desi chickpea for processing mainly for export to Turkey. The two processing plants located in the vicinity of Ada'a-Liben can strongly benefit from increased availability of both Desi and Kabuli chickpeas for processing. The Arba and Tryaki Grain and Pulse Industry is not currently using Kabuli chickpeas, suggesting the need to pilot such a program to stimulate local processing and value addition that may expand and diversify markets for Kabuli chickpea. Recently, lack of trust and collaboration between the farmers and the Green Star processing company has however affected the supply of Kabuli chickpeas to the factory. Given that the factory is based at the heart of the chickpea growing region, there is a need to develop mutually acceptable and flexible, but legally binding contracts to enhance business opportunities for both parties. Such arrangements can be worked out with EFU to ensure consistent supply of high quality Kabuli and Desi chickpeas at competitive prices. It should be in the interest of the processing factory to pay some premium to its local suppliers of high quality raw materials as this would directly compete with export markets for the union and other grain exporters. For imported ingredients, the important reference for the

processor should be the import parity prices, which is significantly higher than the export parity price for Ethiopian farmers.

On the other hand, almost all of the medium and small scale processors (locally known as *baltinas*) are found in the tertiary markets and their number is comparably higher than that of large scale processors. They require both Desi and Kabuli chickpeas, although their demand for Desi is relatively higher. However, almost all of them have more than one selling point in and outside Addis Ababa. In addition, most of their products are available in most supermarkets and directly sold to consumers through small outlets in urban areas.

Exporters

In Ethiopia there are a number of grain exporting private and government owned companies. None of the exporters included in this study specialized on chickpea trade only. Some of the exporters also engage in multiple businesses including wholesaling and retailing of grains in the domestic market. Almost all of them are engaged on Desi type chickpeas, while few (about three) also handle Kabuli type chickpea. This is mainly because of the limited availability of Kabuli chickpeas in the markets. Of the total exported chickpea volume by the sampled exporter, Desi type chickpea comprised about 82% and Kabuli types the remaining 18%. Almost all chickpea exporters complain about shortage of Kabuli supply for export market. Some of them were even unable to meet export orders from foreign customers, making it difficult to expand markets for Kabuli exports. This pattern is likely to change as the local availability of Kabuli increases, especially for large-seeded types with higher demand in export markets. The increased availability of small-seeded Kabuli chickpea is not however going to make Ethiopian exporters competitive as domestic prices are high while prices for small-seeded Kabuli in international markets are very different from Desi chickpeas. This is especially the case in south Asian markets which are very sensitive to prices than quality at this time.

5.3 Selling patterns of different market participants

A number of grain assemblers and few wholesalers from the secondary markets operate in the collection of grain from smallholder farmers. About 57% of the marketed surplus of smallholders is sold to rural assemblers, and about 20% to *woreda* wholesalers, 16% to farmer cooperatives and the union, 7% to rural retailers and about 1% to *woreda* retailers. In Ada'a-Liben *woreda* there are about twelve primary (village) markets, of which about nine are active for chickpea marketing. The share of the total traded volume

procured from different marketing points for each trader is shown in Annex 1. Traders in the primary and secondary market have identified up to eight points of origin in Ada'a-Liben where chickpea is collected. The assemblers collect about 85% of the Desi and 80% of the Kabuli traded volumes from these village markets. Some of the assemblers also collect from the primary markets in the neighbouring *woredas* (Akaki and Gimbichu) as well as some farmers who directly bring their produce to Debre Zeit town. On the other hand the rural retailers in Ada'a-Liben purchase all their produce from the local village markets, showing more permanence and limited mobility for these buyers. On the other hand, *woreda* wholesalers collect about 55% of their volumes directly from the village markets, while 40% is collected from Debre Zeit town, where these traders are based. The *woreda* retailers collect about three-quarters of the traded volume in Debre Zeit town while the balance mainly comes from the village markets in the *woreda*. On the other hand, the urban wholesalers in Nazareth and Addis Ababa have the option of procuring produce from a wider set of suppliers across the country. The results show that these traders procure some 30% of their Desi and almost all of the Kabuli traded volumes from the secondary markets in Debre Zeit town. Some of the Desi volume is procured directly from village markets in Ada'a-Liben (6.5%), from Becho (16%), Mojo and Ejere (15%), Minjar (8%), and as far as Gojjam (11%), and Gondar (7%). Recently, there is a relative shift in chickpea flow to the Nazareth tertiary market, particularly for chickpea procured from Ada'a-Liben, Akaki, Gimbichu and the surrounding *woredas*. This is a reflection of the relatively lower transportation costs to the export outlet at the Djibouti seaport and the availability of larger warehouse facilities in the city of Nazareth.

Unlike the *woreda* wholesalers, the farmers union and cooperatives do not engage in marketing Desi chickpeas and specialize only in trading Kabuli types. About 56% of the volume is sourced from Ada'a-Liben through the primary cooperatives therein. About 26% is sourced from Akaki *woreda* and the remaining 18% from Gimbichu *woredas*. This confirms the relative dominance of Ada'a-Liben as a major supplier of both Kabuli and Desi chickpeas. When it comes to the surveyed supermarkets in Nazareth and Addis Ababa, 96% of the Desi and 92% of the Kabuli supply is sourced from Akaki town. About 8% of the Kabuli is sourced from wholesalers in Addis Ababa. In relation to the processors, almost 100% of the Desi supply is sourced from Addis Ababa, while all of the Kabuli is sourced from Akaki town. The grain exporters source their Desi supplies from different locations; Debre Zeit (25%), Addis Ababa (17%), Becho (14%), Akaki (11%), Nazareth (6%) and the balance from different markets including markets in Gojjam, Gondar and Dessie. For Kabulis, the exporters rely on Debre Zeit town (68%), Akaki (12%) and other markets in the surrounding areas where Kabuli production has taken off.

When we look at the selling patterns of different market participants, the rural assemblers supply about 54% of their purchase to *woreda* wholesalers, 39% to urban wholesalers, and about 7% to *woreda* retailers. The chickpea collected by *woreda* wholesalers in the secondary market has diverse market outlets in other parts of the country including Addis Ababa, Nazareth, Awassa, Mekele and Welayeta Sodo. The *woreda* wholesaler in Debre Zeit sells more than 70% of the volume to the grain exporter and 20% to the processors in Addis Ababa and Nazareth. On the other hand, the farmers union sells 37% of the volume to exporter while 39% is sold to *woreda* wholesalers who in turn supply exporters, processors and urban wholesalers. In the case of tertiary market, the urban wholesalers who source their supplies from assemblers, *woreda* wholesalers and from the farmers union, distribute their stocks to grain exporter (43%), processors (30%) and retailers (16%) in Addis Ababa and Nazareth, while 11% is marketed to wholesalers in other parts of the country that need chickpeas for domestic consumption. The grain exporters send about 82% of their stocks to foreign markets; Desi type chickpea was exported to Pakistan, India, Bangladesh and Dubai; while Kabuli types are exported to Pakistan, India, Saudi Arabia and Turkey. Exporters also supply the balance to domestic processors, which provides an alternative trade outlet to exporters especially when the grain fails to meet international quality standards or when export prices are too low to make Ethiopian exports competitive.

In the case of the processors, representing the small and medium scale *baltinas* and other commercial processors, their marketing channels involve selling to urban consumers (60%) and supermarkets (40%). Some of these processors may have their own outlets for retailing their value added produce (e.g. *shiro, kolo* etc.) directly to consumers. The small-scale urban retailers target consumers directly while some of their stocks may also be sold to supermarkets, which otherwise depend on processors for their supply of value added chickpea products. As expected, the urban consumers represent the only outlets for supermarkets (Figure 2).

5.4 Marketing channels and distribution of costs and margins

As discussed earlier, the chickpea marketing system in the country is very complex, linking a number of actors as the grain moves from the producer to the consumer or end-user. The number of links in the market chain reflects the services that are required to deliver chickpea to the different consumers and end-users. Despite the length of the marketing chain, the structure of the chickpea markets shows limited transformation or value addition that takes place as the grain moves within a given marketing chain. The bulk of the chickpea grain is transacted in unprocessed form.

This suggests that, beyond transport and limited storage, relatively few market services are provided by intermediaries, indicating a relatively unsophisticated market structure (Gabre-Madhin 2001). While the overall structure of the marketing system is quite complex, few major marketing channels (value chains) linking producers with different end-users may be identified:

- Channel 1: Rural retailers channel
- Channel 2: Assembler to *woreda* retailer channel
- Channel 3: Assembler to urban retailer channel
- Channel 4: Assembler to processor channel
- Channel 5: Assembler to supermarkets channel
- Channel 6: Assembler to exporter channel
- Channel 7: *Woreda* wholesaler to exporter channel
- Channel 8: Farmers union to exporter channel
- Channel 9: Farmers union to processor channel

These nine marketing channels represent the full range of available outlets through which the grain moves from the primary and secondary markets in Ada'a-Liben to domestic consumers and grain exporters to meet end-user needs in foreign markets. The rural retailers handle only a small volume of the total marketed surplus of mainly Desi types. They collect directly from farmers and retail it to rural consumers in village shops, making this channel to be the shortest chain in the marketing system. The rural consumers include those engaged in non-agricultural activities and farmer net buyers of chickpeas (mainly those who do not grow the crop). The rural assemblers, who collect the largest proportion of both Desi and Kabuli produce from farmers, are critical players in feeding alternative marketing channels. Most of the processed and packed chickpea sold in the supermarkets so far is prepared from Desi types. This seems to be showing changes as some supermarkets have already started selling unprocessed and processed Kabuli chickpeas to domestic consumers. The *woreda* wholesalers are also important as they procure some of the produce from farmers and channel this to processors and exporters. The farmers union is another player in the market with its own marketing chain extending from the primary cooperatives to processors and exporters. The length of the chain and the number of links in the value chain depend on the distance between the assemblers and the final outlet to the consumer or the exporters.

The marketing costs, margins and farmers' share in the final price in the value chain is depicted in Figure 3. When we look at the total marketing costs for the different channels, channel 5 linking assemblers with the supermarkets has the highest costs, followed by channel 4 linking assemblers with processors, then channel 7 linking wholesalers with supermarkets, and channel 9 linking the farmers' union with processors. The lowest marketing costs are in the shortest chains ending in the rural areas (channels 1 and 2)

where transport and handling costs are low. The size of the marketing costs therefore depends on the number of links in the chain and the costs incurred in handling, cleaning, processing, packaging and transporting the product. For example, channels 5 and 7 involve five linkages along the chain and require grain cleaning, processing and packaging to deliver the product to the consumer through supermarkets, hence high costs for these channels. On the other hand, channel 3 also involves five market linkages in moving the product from the producer to the urban consumer through local retail outlets which do not require processing and packaging. Hence, the costs remain low for this channel despite the extended linkages and transactions required.

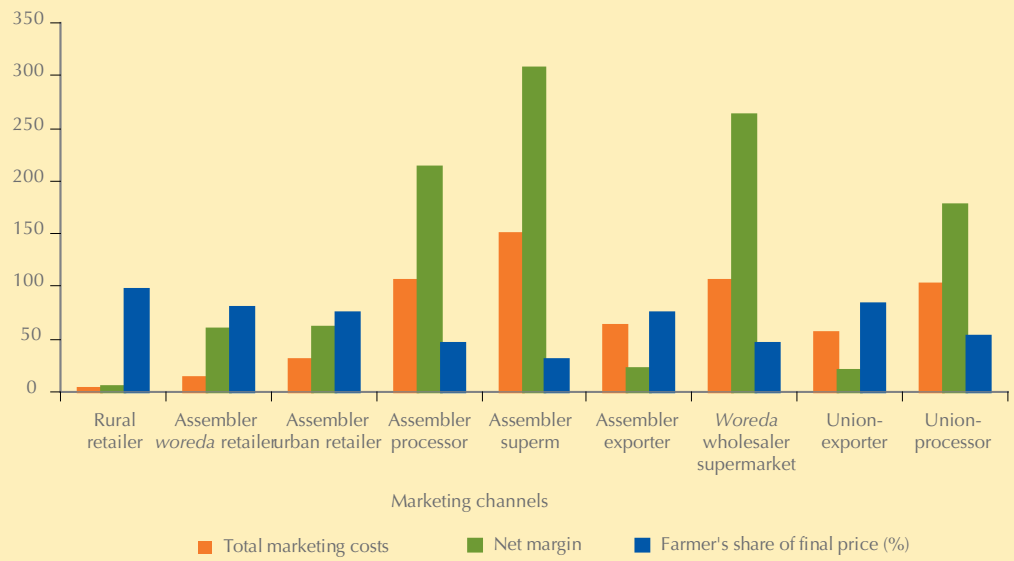


Figure 3. *Costs, margins and farmers' shares in chickpea marketing channels.*

As expected, the marketing margins are directly related to the size of the marketing costs in each channel (Table 7 and Figure 3). The channels with high marketing costs also have high gross marketing margins. Those with lowest costs have low margins, indicating that prices are directly related to the costs incurred in the value chain. What is interesting is that the total net margins in the channel also seem to be directly related to the total marketing costs. For example, the lowest net margin (ETB 5.30/qt) is observed at primary market level where grain is sold directly from producers to consumers only through rural retailers. The highest net margin of ETB 307/qt is realized in channel 5 where the total marketing costs are highest and the final consumer price is high. The distribution of the costs and net margins for different market participants involved in each channel will be discussed below.

The prices received by farmers vary depending on the outlet used and the type of buyer. The farmers' union pays the highest price, followed by *woreda* wholesalers, assemblers and retailers. The assemblers also seem to pay different prices to the farmer depending on the forward contracts they receive from their buyers. When we look at the farmers' share of the final consumer price in each channel, it shows that smallholder producers capture the largest share of the price for channels ending in the primary markets, followed by secondary and tertiary markets. For example, the farmers capture about 97% of the final price in channel 1 and 80% in channel 2. This compares with 31% in channel 5 and 45% in channels 4 and 7. An important point to note is the situation in channel 8 where the direct links between the farmers' union and the exporter significantly improve the farmers' share (83%) of the export price. This is significantly different from channel 9 where the chain is much longer and total marketing costs are almost twice that of channel 8; the grain from the farmers' union in this case is channelled through *woreda* wholesalers to processors operating mainly in tertiary markets. This clearly indicates that if EFU could strengthen its direct linkages with exporters, supermarkets and processors, the farmers would be in a position to capture a significant share of the value added in these channels.

The pattern of changes in prices within each of the identified value chains and the distribution of costs and margins across different market participants is also shown in Table 7. As discussed earlier, high transaction cost and marketing margins are found in channels starting from primary markets and ending in tertiary markets and where multiple actors are involved between the producers and the final consumers. The cost shares to assemblers are quite high in channels where value adding practices are limited as assembling often involves extensive travel to rural markets and transporting the produce to the secondary markets. The cost shares are highest for actors adding value or handling the bulk of activities (e.g. wholesalers and processors) within the value chain. In most cases the largest profit share is taken by actors in the tertiary markets. For example, highest transaction cost and net margin of ETB 150/qt and ETB 307/qt, respectively, is recorded in channel 5 where chickpea flows from producers to consumers passing successively through assemblers, *woreda* wholesalers, processors, and supermarkets. In this channel about 95% of the profit share goes to the supermarket and processor while the balance is shared among actors in the primary and secondary markets (assemblers and *woreda* wholesalers). While actors who pay the highest share of the marketing cost generally receive a proportionately higher share of the profits in each channel, this is not always the case in some channels.[1] The high consumer prices in the supermarket

1. While calculating the full costs of supermarkets and processors is difficult especially when chickpea is mixed with other foods, the available information indicates that the supermarkets capture about 78% of the profits in channel 5 while the processors account for about 16%. This is contrary to the distribution of costs where the processors account for about 59% and the supermarkets about 30%.

Table 7. *Selling prices (ETB/100 kg) and distribution of costs and profits in chickpea marketing channels*

	Channel 1			Channel 2			Channel 3			Channel 4			Channel 5		
	Rural retailer			Assembler–*woreda* retailer			Assembler–urban retailer			Assembler–processor			Assembler–supermarket		
Market actors	Selling price	Profit share	Cost share	Selling price	Profit share	Cost share	Selling price	Profit share	Cost share	Selling price	Profit share	Cost share	Selling price	Profit share	Cost share
Farmer	261.0	–	–	270.5	–	–	270.5	–	–	270.5	–	–	210.0	–	–
Assembler	–	–	–	285.0	10.1	56.0	286.0	31.4	23.1	286.0	4.5	6.8	229.0	3.8	4.9
Rural retailer	269.5	100.0	100.0	–	–	–	–	–	–	–	–	–	–	–	–
Cooperative union	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Woreda wholesaler	–	–	–	–	–	–	325.5	30.5	32.4	329.5	13.5	9.6	246.0	2.3	6.6
Woreda retailer	–	–	–	342.5	89.9	44.0	–	–	–	–	–	–	–	–	–
Urban wholesaler	–	–	–	–	–	–	339.5	8.7	20.0	–	–	–	–	–	–
Urban retailer	–	–	–	–	–	–	363.5	29.4	24.5	–	–	–	–	–	–
Processor	–	–	–	–	–	–	–	–	–	590.0	82.0	83.6	383.0	15.9	58.8
Grain exporter	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Supermarket	–	–	–	–	–	–	–	–	–	–	–	–	667.0	78.0	29.7
Total marketing costs	3.2	–	–	12.9	–	–	31.3	100.0	100.0	105.6	100.0	100.0	150.0	100.0	100.0
Total marketing margin	8.5	–	–	72.0	–	–	93.0	–	–	319.5	–	–	457.0	–	–
Net margin	5.3	–	–	59.1	–	–	61.7	–	–	213.9	–	–	307.0	–	–
Farmer's share of final price	96.6	–	–	79.8	–	–	75.8	–	–	45.5	–	–	31.5	–	–
Total profit/cost shares	–	100.0	100.0	–	100.0	100.0	–	100.0	100.0	–	100.0	100.0	–	100.0	100.0

Table 7. (cont.)

	Channel 6			Channel 7			Channel 8			Channel 9		
	Assembler–exporter			*Woreda* wholesaler–supermarket			Union–exporter			Union–processor		
	Selling price	Profit share	Cost share	Selling price	Profit share	Cost share	Selling price	Profit share	Cost share	Selling price	Profit share	Cost share
	–	–	–	–	–	–	–	–	–	–	–	–
Farmer	270.5	–	–	310.5	–	–	373.0	–	–	309.0	–	–
Assembler	286.0	40.1	11.5	–	–	–	–	–	–	–	–	–
Rural retailer	–	–	–	–	–	–	–	–	–	–	–	–
Cooperative union	–	–	–	–	–	–	387.0	28.6	14.4	322.5	6.2	4.1
Woreda wholesaler	301.5	21.3	16.1	328.0	3.0	11.8	–	–	–	340.5	4.3	9.9
Woreda retailer	–	–	–	–	–	–	–	–	–	–	–	–
Urban wholesaler	–	–	–	396.5	25.7	7.1	–	–	–	–	–	–
Urban retailer	–	–	–	–	–	–	–	–	–	–	–	–
Processor	–	–	–	383.0	6.8	29.6	–	–	–	590.0	89.5	86.0
Grain exporter	356.0	38.7	72.4	–	–	–	450.0	71.4	85.6	–	–	–
Supermarket	–	–	–	679.0	64.6	51.5	–	–	–	–	–	–
Total marketing costs	62.9	100.0	100.0	105.0	100.0	100.0	56.7	100.0	100.0	102.7	100.0	100.0
Total marketing margin	85.5	–	–	368.5	–	–	77.0	–	–	281.0	–	–
Net margin	22.6	–	–	263.5	–	–	20.3	–	–	178.3	–	–
Farmer's share of final price	75.5	–	–	45.5	–	–	82.9	–	–	52.2	–	–
Total profit/cost shares	–	100.0	100.0	–	100.0	100.0	–	100.0	100.0	–	100.0	100.0

channels—an attribute of the high willingness and ability to pay for the selected consumers using this channel—do seem to allow these actors to capture a higher share of the channel profits.

5.5 Chickpea collection and distribution points

The survey results about the collection and distribution points for chickpea taking Ada'a-Liben as reference points indicated that number of chickpea buying and selling points vary across actors in the primary, secondary and tertiary markets. Traders in the primary markets in Ada'a-Liben have at least one (51%) buying and selling (62%) points within the *woreda*. About 41 and 16% have two buying and selling points respectively (Table 8). However, very few actors in the primary markets have buying and selling points outside of the *woredas*. More specifically, few traders in the primary markets who used markets outside of the *woredas* used Akaki and Gimbichu *woredas* as buying points of origin and Akaki, Nazareth and Addis Ababa as important selling points. For traders in the secondary market, about eight buying and two selling points in Ada'a-Liben were identified. About 50% of the traders in the secondary markets have more than three buying points, while some 78% seem to have at least one selling point (Table 8). Unlike the actors in the primary markets, the traders based in the secondary market (Debre Zeit town) had a much wider purchasing and selling network extending outside of the *woreda*. Still, Akaki and Gimbichu were important chickpea buying points of origin while Addis Ababa and Nazareth served as major chickpea selling points for these traders. Particularly, the results indicated that all traders in the secondary markets have selling links with traders in Addis Ababa market.

Table 8. *Chickpea buying and selling points in and outside Ada'a-Liben* woreda *(% of traders)*

	Number of markets	Market type						Total (N = 122)	
		Primary (N = 68)		Secondary (N = 14)		Tertiary (N = 40)		Buying	Selling
		Buying	Selling	Buying	Selling	Buying	Selling		
In Ada'a-Liben	0	0.0	10.3	0.0	14.3	55.0	95.0	18.0	38.5
	1	51.5	61.8	28.6	78.6	35.0	5.0	43.4	45.1
	2	41.2	16.2	21.4	7.1	10.0	0.0	28.7	9.8
	>3	7.4	11.8	50.0	0.0	0.0	0.0	9.8	6.6
Outside Ada'a-Liben	0	91.2	85.3	57.1	42.9	10.0	0.0	60.7	52.5
	1	8.8	11.8	21.4	21.4	47.5	87.5	23.0	37.7
	2	0.0	2.9	14.3	21.4	7.5	5.0	4.1	5.7
	>3	0.0	0.0	7.1	14.3	35.0	7.5	12.2	4.1

Unlike traders in the primary and secondary markets, only few traders in the tertiary markets directly buy from markets in Ada'a-Liben *woreda*. About 55 and 95% of these

traders have no buying or selling points within the *woreda*. However, these traders have a much wider collection and selling network outside of the *woreda*. About 47 and 87% of these traders have at least one buying and selling point outside of the *woreda* (Table 8). These traders access up to nine chickpea buying points outside Ada'a-Liben, namely Akaki, Minjar, Betcho, Mojo, Addis Ababa, Welonkomi, Gojjam, Gondar and Dessie. Similarly, the selling destinations included Addis Ababa, Nazareth, Awassa, Dilla and Yirgalem as major domestic markets and India, Turkey, Saudi Arabia, Pakistan, Bangladesh, and Dubai as important export markets.

5.6 Quality characteristics of traded chickpea

The survey found that traders at all market levels classify chickpeas into three informal grades, although the third chickpea grade was recognized by fewer respondents especially in the primary and secondary markets. About 75% of traders recognized Kabuli chickpeas as having two grades (Grades 1 and 2). There is uncertainty about the number of valid quality grades for Desi types. For Desi chickpea, majority of the sample traders in the primary markets (70%) recognized only one quality grade for the commodity. About 44% of the traders overall seem to recognize only one quality grade, while the same proportion of the traders also seemed to recognize two grades in the markets (Table 9).

Table 9. *Number of grades established in chickpea marketing (% of respondents)*

No. of grades	Kabuli chickpea				Desi chickpea			
	Market type				Market type			
	Primary	Secondary	Tertiary	**Total**	Primary	Secondary	Tertiary	**Total**
1	14	0	15	**12**	70	0	7	**44**
2	82	67	65	**75**	28	92	58	**44**
3	5	33	20	**13**	2	8	36	**12**

The study also looked at the market traits that are important in determining quality grades for chickpeas. The results are presented in Tables 10 and 11. The major quality traits used in markets to classify chickpea grades include grain colour, grain size, presence of foreign matter and broken and shrivelled seeds. For Kabuli chickpea, the highest quality grade requires about 98% white colour grain, 96% large seeded grain, and less than 4% foreign matter and 4% shrivelled and broken grain (Table 10). On the other hand, the second quality grade prescribes about 96% white coloured grain, 91% large seeded grains, and less than 5% foreign matter and 5% shrivelled and broken grains. This indicates that Kabuli grades fall when the proportion of white large seeded grain decreases and the proportion of foreign matter and shrivelled and broken grain increase.

Table 10. *Grade and grade requirements for Kabuli chickpea at different markets (%)*

Characteristics	Primary		Secondary		Tertiary		Total	
	Grade 1	Grade 2	Grade 1	Grade 2	Grade 1	Grade 2	Grade 1	Grade 2
White colour	97.54	96.50	98.00	95.33	98.00	96.00	97.68	96.21
	(2.73)	(3.44)	(0.50)	(0.82)	(0.00)	(1.41)	(2.27)	(2.96)
Large seeded	95.95	91.63	98.11	88.86	98.00	92.50	96.41	91.23
	(2.86)	(6.84)	(0.60)	(17.15)	(0.00)	(3.54)	(2.68)	(8.92)
Foreign matter	4.91	5.83	1.91	3.67	2.40	4.25	4.13	5.31
	(4.67)	(5.23)	(0.54)	(0.71)	(0.89)	(1.26)	(4.18)	(4.58)
Shrivelled seed	4.23	4.67	–	–			4.23	4.64
	(3.87)	(3.99)	–				(3.87)	(3.90)

* Figures in parenthesis are standard deviation.

Table 11. *Grade and grade requirements for Desi chickpea at different markets (%)*

Characteristics	Primary		Secondary		Tertiary		Total	
	Grade 1	Grade 2	Grade 1	Grade 2	Grade 1	Grade 2	Grade 1	Grade 2
Red colour	93.95	80.00	93.95	80.00	93.95	80.00	93.95	80.00
	(2.67)	(7.98)	(2.67)	(7.98)	(2.67)	(7.98)	(2.67)	(7.98)
Large seeded	95.64	90.00	95.64	90.00	95.64	90.00	95.64	90.00
	(3.18)	(0.00)	(3.18)	(0.00)	(3.18)	(0.00)	(3.18)	(0.00)
Foreign matter	6.34	7.50	6.34	7.50	6.34	7.50	6.34	7.50
	(5.69)	(3.71)	(5.69)	3.71)	(5.69)	(3.71)	(5.69)	(3.71)
Shrivelled seed	5.80	7.25	5.80	7.25	5.80	7.25	5.80	8.00
	(4.92)	(4.27)	(4.92)	(4.27)	(4.92)	4.27)	(4.92)	(7.98)

* Figures in parenthesis are standard deviation.

For Desi chickpea, the requirements for the first quality grade are about 94% red colour grain, 96% large seeded grain, and not more than 6% foreign matter and less than 6% shrivelled grain (Table 11). The second grade on the other hand requires about 80% red colour grain, 90% large seeded grains, and not more than 8% foreign matter and shrivelled and broken grains. There seems to be overall awareness about what matters for quality, but much less is known on how such grades relate to prices. This is unlike the case of major staple crops like teff where the consumers and traders alike generally know about the different grades and the associated prices.

This quality classification of chickpea is actually based on visual observation and it does not include any of the hedonic characteristics of the product. In many cases, visual inspection of the product is needed to determine the quality standards, which often requires the presence of the trader or his agent at the point of transactions (Gabre-Madhin 2001). The traders usually take random samples from a given consignment using a special sampling device which can be inserted into sacks and check for the major market preferred traits before they set their offer prices. While the Quality and Standards Authority of Ethiopia has established three quality grades for chickpea (Table 12), much less is known on how the informal classification of chickpea grades based on grain size and colour conforms to these standards. Where the formal standards focus primarily on Sanitary and Phytosanitary standards (SPS), it does not address the market traits that are

specific to Kabuli and Desi chickpeas. However, in order to compete effectively in the global trading system it is important to satisfy the food quality, SPS and other non-tariff barriers to trade.

Table 12. *Ethiopian grades and standards for chickpea*

Grade	Maximum allowable limits (%)					
	Damaged chickpeas		Splits	Shrivelled chickpeas	Chickpeas with cracked coat	Foreign matter
	Badly damaged	Total				
1	0.3	1.0	0.5	2.0	3.0	0.2
2	0.8	1.5	1.0	4.0	5.0	0.5
3	1.5	2.0	1.5	8.0	7.0	0.5

* Source: Quality and Standard Authority of Ethiopia.

Even though the quality characteristics of chickpea in the study areas do not always conform to the formal standards and requirements, the market still considers and gives weight for some of the quality parameters than the others. In order to evaluate traders' assessment of the different market quality characteristics of chickpea, traders were asked to rank certain quality traits according to their importance (1 = most important and 4 = least important). These grain attributes were identified by the key informants during the discussions held before the formal survey was conducted. In the results indicate that in general grain size, colour, presence of foreign matter and uniformity of the grain in terms of size and colour are the most important quality parameters used to characterize both Kabuli and Desi chickpeas (Table 13). We found that hedonic quality parameters such as moisture content and cooking ability and other quality parameters such as place of origin were not important factors in determining chickpea grades in the current marketing system. This may reflect the difficulties in gathering and ascertaining such information to enable quick and efficient transactions.

Table 13. *Average ranking of chickpea quality characteristics*

Characteristics	Kabuli				Desi			
	Primary	Secondary	Tertiary	**Total**	Primary	Secondary	Tertiary	**Total**
Colour	2.59	3.08	3.17	**2.84**	1.88	3.08	3.02	**2.39**
Size	2.62	2.00	3.00	**2.68**	2.09	2.31	2.95	**2.40**
Uniformity in size/colour	3.69	3.38	3.63	**3.64**	3.38	3.31	3.17	**3.30**
Insect damage	3.76	3.92	4.00	**3.86**	3.53	4.00	3.83	**3.68**
Foreign matter	3.50	2.00	3.78	**3.43**	3.25	1.92	3.49	**3.19**
Moisture content	3.97	4.00	3.98	**3.98**	3.99	4.00	3.90	**3.96**
Cooking ability	4.00	3.92	3.88	**3.95**	4.00	4.00	3.66	**3.89**
Place of origin	4.00	4.00	4.00	**4.00**	4.00	3.85	3.78	**3.91**

As far as quality composition of traded chickpea is concerned, compared to primary markets, secondary and tertiary markets had the highest proportion (about 80%) of

Kabuli chickpea rated to be grade one while primary markets had most of the chickpea in grade two categories (Table 14). This may indicate some divergence on how the same grain is rated into different quality grades in the different markets, where primary markets generally under value quality. For Desi types, the perception of quality grades seems to decline in the tertiary markets, indicating that traders in different markets may have different standards and market requirements. The proportion of Grade 1 Desi declined from 88 and 92% in the primary and secondary markets to 54% in the tertiary markets. This seems to dampen the price differential at the local level between the first and second quality grades.

Table 14. *Quality composition of chickpea sold at different markets (% of transactions)*

Market	Desi			Kabuli			Total		
	Quality of the grain			Quality of the grain			Quality of the grain		
	Grade 1	Grade 2	Grade 3	Grade 1	Grade 2	Grade 3	Grade 1	Grade 2	Grade 3
Primary	88.8	11.0	0.2	47.8	52.0	0.2	71.7	28.1	0.2
Secondary	92.8	7.2	0.0	80.1	19.9	0.0	88.4	11.6	0.0
Tertiary	54.7	38.7	6.7	80.9	19.1	0.0	61.7	33.3	5.0
Total	83.9	14.8	1.3	55.6	44.2	0.2	73.1	25.0	0.9

Quality grades will not have any relevance if market prices do not reflect such differentiation. The survey results indicate that at all market levels (except for Desi in primary markets) quality seems to attract a price premium. On average, there was a margin of about ETB 27/qt for Kabuli chickpea and ETB 15/qt for Desi chickpea (Table 15). Interestingly, the level of significance of quality increases substantially in the tertiary market than the other markets. The price differential between grades in this market for Kabuli chickpea reaches up to ETB 72/qt. As we show later, the effect of quality on prices is much lower in the primary markets than in the secondary and tertiary markets. This can be partly seen from the lack of significant difference in price–quality effects for Desi chickpea in the primary markets.

Table 15. *Price premium for chickpea due to quality difference (selling price, ETB/qt)*

Crops grade	Primary market		Secondary market		Tertiary market		Total	
	Mean	t-value	Mean	t-value	Mean	t-value	Mean	t-value
Kabuli: Grade 1	348.50 (68.09)	3.89***	411.80 (65.18	1.74*	602.27 (132.11)	4.93***	397.25 (117.48)	9.92***
Kabuli: Grade 2	331.03 (63.90)		393.18 (52.42)		477.62 (96.51)		341.15 (72.32)	
Desi: Grade 1	224.05 (53.24)	1.29	253.13 23.45)	6.90***	282.25 (73.50)	6.09***	235.82 55.24)	1.73*
Desi: Grade 2	216.69 (63.55)		236.30 (9.68)		241.80 (39.00)		229.79 (52.05)	

*** and * indicate significant difference at 1 and 10% respectively.
Figures in parenthesis are standard deviations.

5.7 Seasonal movements in prices

Different markets are characterized by differences in seasonal price patterns. For example, in chickpea marketing the highest price is during the low supply (off production) season, from July to August and lowest during the high supply season, January to May, following harvest (Figure 4). Additional details on seasonality of chickpea marketing for the different traders are shown in Annex 2. As far as Kabuli chickpea marketing is concerned, the largest amplitude could be detected in the primary market as prices during the peak price season were more than 40% higher than prices at the harvest season (Table 16). The smallest price difference was seen in the secondary market followed by the tertiary market, perhaps indicating that most of the transactions in these markets occur during the peak price period. This may be due to the fact that some time is lapsed as the grain moves from the primary to secondary and tertiary markets, often separated by geographical distances. However, prices during the peak price season were still higher than the prices in the off-peak season.

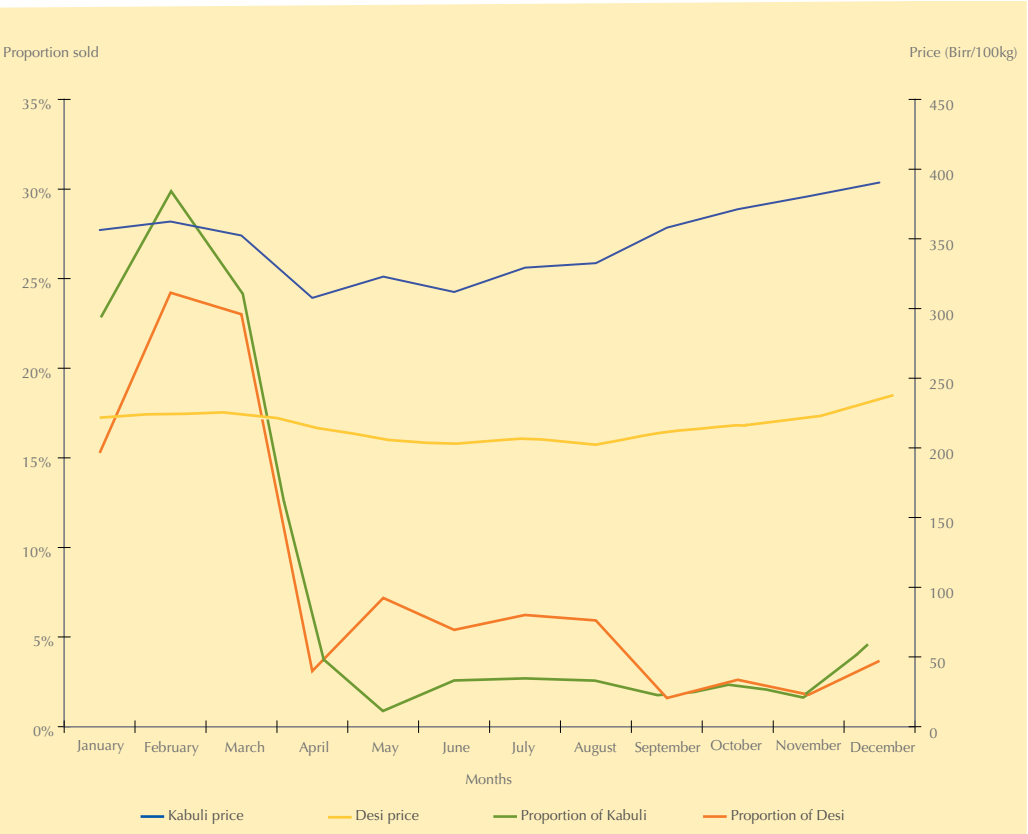


Figure 4. *Seasonal availability and price patterns for chickpea in Ada'a-Liben (2005–2006).*

Table 16. *Seasonal variations in prices (ETB/100 kg) of Kabuli and Desi chickpea at different market levels during peak and off-peak periods*

Crop	Peak price period		Off-peak price period		Absolute value of difference		
Market	Mean	CV (%)	Mean	CV (%)	Mean	CV (%)	t-value
Kabuli (All)	443	23.25	364	38.74	79	15	
Primary	414	7.97	294	23.47	120	16	9.987***
Secondary	403	7.94	398	7.04	5	1	1.778*
Tertiary	553	31.10	535	34.58	18	3	2.459**
Desi (All)	271	19.93	216	17.13	55	3	
Primary	265	12.08	192	16.15	73	4	12.768***
Secondary	233	15.02	225	44.44	8	29	1.418
Tertiary	313	28.75	297	22.90	16	6	2.768***

*, ** and *** indicate statistical difference at 10, 5 and 1% level respectively.

Table 16 also indicated that except for Desi chickpea in the secondary markets, prices were significantly higher during the peak price period than in the off-peak price period. Similar to Kabuli chickpea, the seasonal price differences are also highest for Desi chickpea in the primary markets, indicating that farmers could indeed earn higher prices if they could defer selling until the high supply season passes.

Price stability seems to be higher in the secondary market than in the primary and tertiary markets that seem to be affected more quickly in response to domestic and international price trends. Seasonality in chickpea prices is associated with seasonal nature of production mainly due to dependency on rain-fed agriculture. Under the assumptions of perfect competition, seasonality would reflect the cost of storage including a cost representing a risk premium for holding onto stocks plus normal profits of the storage agent (Minten 1999). In practice, higher seasonality could also be related to non-competitive market practices and uncertainty in seasonal price movements.

5.8 Determinants of chickpea prices

One of the key questions asked in chickpea markets is how prices vary along the value chain and the role that seasonality, quantity and quality factors affect commodity prices. We use a regression model to test the effect of these factors. Of the 2978 recorded chickpea transactions used in the model, 62% were Desi and 38% Kabuli. Three types of models are fitted: pooled model and commodity specific models (Desi and Kabuli). Plot of average monthly price data for Desi and Kabuli indicated that Kabuli price were higher than Desi throughout the year (Figure 4). Hence, initially the pooled model is estimated using the entire sample of chickpea transactions where commodity types were controlled using indicator (dummy) variables. However, because certain attributes (such as quality) of the two chickpeas are quite different, making it difficult to properly capture their effects in the pooled model, separate regressions were estimated for Desi and Kabuli

chickpeas. In addition to the type of chickpea, several other variables were hypothesized to determine the selling price of chickpeas. These include characteristics of the seller, access to market information, type of buyer, point of transaction within the value chain, amount sold, perceived quality of the grain, season and year, transaction costs incurred by the seller, and frequency of transactions between the buyer and seller. Table 17 provides summary statistics of the variables used in the price formation model.

Table 17. *Descriptive statistics for parameters in the price formation model for chickpea (aggregated) and individually for Kabuli and Desi*

Parameters	Values	Crop sold		
		Total (N = 2978)	Desi (N = 1835)	Kabuli (N = 1143)
Sex of the respondent (dummy)	1 = if male	79.62	79.89	79.18
Access to information (dummy)	1 = if owned telephone	60.28	58.37	63.34
Frequency of transactions (dummy)	1 = if long standing customer	38.89	42.29	33.42
Market type (dummy)	1 = if primary	69.98	66.32	75.85
	1 = if secondary	16.25	17.33	14.52
Quality (dummy)	1 = if grade 1	73.07	83.92	55.64
Time of sale (dummy)	1 = if 1997	72.90	72.15	74.10
Seasonality (months of transaction) /dummy/	1 = if sold in January, February, March	49.90	50.08	49.61
	1 = if sold in April, May, June	18.94	19.67	17.76
Buyer type dummy	1 = if rural consumers/ farmers	10.81	14.71	4.55
	1 = if woreda wholesalers	26.26	22.78	31.85
	1 = if woreda retailers/ consumers	26.76	24.25	30.80
	1 = if urban wholesalers	13.67	14.71	11.99
	1 = if exporter	9.20	9.59	8.57
Education level of the respondent		7.96 (4.52)	7.41 (4.63)	8.84 (4.20)
Years of experience in crops trading		7.85	7.96	7.67
		(4.75)	(5.18)	(3.95)
Amount sold (100 kg)		65.03 (298.19)	84.80 (362.47)	33.30 (138.44)
Transaction cost, ETB/100 kg		7.89 (8.87)	7.42 (8.35)	8.64 (9.61)

Figures in parenthesis are standard deviations.
N refers to number of transactions.

The estimated regression results for the price determination models (aggregate model and separate models for Desi and Kabuli) are presented in Table 18. The explanatory power of the model was relatively good for the pooled data (R-square = 0.72) compared to the

separate models for Desi (R-square = 0.4) and Kabuli (0.6). The pooled model shows that about 72% of chickpea price variation in the different markets is explained by the model variables. The estimated coefficients generally have the expected signs.

Table 18. *Determinants of Desi and Kabuli chickpea prices*

Variable names: Dependent variable is Ln (price of chickpea)	Overall			Desi			Kabuli		
	Parameter estimate	Robust standard errors	Elasticity at means[a]	Parameter estimate	Robust standard errors	Elasticity at means[a]	Parameter estimate	Robust standard errors	Elasticity at means[a]
Intercept	6.11	0.078***	–	5.61	0.090***	–	6.23	0.079***	–
Crop sold (Desi = 1)	–0.45	0.017***	–36.25	–	–	–	–	–	–
Sex (Male = 1)	–0.06	0.024***	–5.85	–0.08	0.025***	–7.72	0.04	0.034	4.02
Ln (Education of the trader)	0.003	0.003	0.003	0.004	0.002*	0.004	–0.01	0.004	0.01
Ln (Experience on grain trading, years)	–0.04	0.013***	0.04	–0.04	0.016***	0.04	–0.02	0.016	0.02
Access to information (Owned telephone = 1)	–0.02	0.023	–2.01	–0.03	0.024	–2.98	–0.01	0.028	–1.03
Ln (Amount sold, 100 kg)	–0.01	0.005***	–0.01	–0.003	0.006	0.003	–0.02	0.005***	0.02
Transaction frequency (Long standing customer = 1)	–0.02	0.019	–2.00	–0.03	0.019*	–2.97	–0.01	0.025	–1.03
Primary market dummy[a]	–0.11	0.044***	–10.50	–0.05	0.056	–5.03	–0.19	0.071***	–17.51
Secondary market dummy[a]	–0.08	0.031***	–7.73	–0.07	0.033**	–6.81	–0.16	0.044***	–14.87
Quality (1st grade = 1)	0.08	0.018***	8.31	0.07	0.019***	7.23	0.05	0.026**	5.09
1st grade × primary market dummy	–0.05	0.024**	–4.90	–0.14	0.039***	–13.13	–0.06	0.031**	–5.87
Time of sale (1997 Eth calendar = 1)	–0.21	0.029***	–18.98	–0.15	0.024***	–13.95	–0.14	0.022***	–13.09
Transaction in January, February and March dummy[b]	–0.08	0.017***	–7.70	–0.05	0.013***	–4.89	–0.09	0.023***	–8.63
Transaction in April, May and June dummy[b]	–0.09	0.012***	–8.61	–0.05	0.011***	–4.88	–0.14	0.012***	–13.07
Ln (Transaction cost, ETB/100 kg)	0.14	0.019***	0.14	0.13	0.028***	0.13	0.09	0.023***	0.09

Table 18. cont'd ...

Variable names: Dependent variable is Ln (price of chickpea)	Overall			Desi			Kabuli		
	Parameter estimate	Robust standard errors	Elasticity at means[a]	Parameter estimate	Robust standard errors	Elasticity at means[a]	Parameter estimate	Robust standard errors	Elasticity at means[a]
Rural consumer/farmers as buyers dummy[c]	–0.05	0.030*	–4.92	–0.002	0.030	–0.24	–0.09	0.065	–8.80
Woreda wholesalers as buyers dummy[c]	–0.06	0.024***	–5.85	–0.02	0.028	–2.02	–0.11	0.056**	–10.56
Woreda retailers/consumers as buyers dummy[c]	–0.08	0.022***	–7.71	–0.05	0.025**	–4.91	–0.12	0.049***	–11.41
Urban wholesalers as buyers dummy[c]	–0.09	0.026***	–8.64	–0.06	0.033**	–5.87	–0.13	0.057***	–12.33
Exporters as buyers dummy[c]	0.02	0.038	1.95	0.04	0.043	3.98	–0.02	0.038	–2.05
R^2	0.724			0.399			0.595		
F-statistic	182.59***			19.13***			58.82***		
Number of observations	2978			1835			1143		

Note: *, ** and *** indicate levels of significance at less than 10, 5 and 1% level respectively.
a. Tertiary markets are considered as reference category.
b. Grain selling during June–December is considered as reference category.
c. Other urban buyers (processors and supermarkets) considered as reference category.

The pooled model results show that, controlling for season, quality, market type and other factors, the price of Desi chickpea is 36% lower than Kabuli types ($P < 0.0001$). This is consistent with the observed historical pattern of chickpea prices in Ada'a-Liben (Figure 1). There was no significant difference between prices received by male and female traders for Kabuli chickpeas. Interestingly, male traders seem to receive significantly lower prices than female traders for Desi chickpeas, which could be partly because male traders with better bargaining or negotiation ability are able to set lower and highly competitive prices, which may lead to crowding out of female traders. Alternatively, the female traders (representing 20% of the sample) fetching higher prices may also earn higher net margins, which may enhance their competitiveness. Hence, the net effect depends on the price elasticity of demand for chickpea and does not lead to a conclusive result on its likely impacts on the overall competitiveness of male and female traders.

The educational level of the trader does not have a significant effect on the chickpea prices received by traders in the different markets, perhaps indicating the relatively unsophisticated nature of the marketing system. On the other hand, experienced traders seem to set relatively lower prices for their product, especially for Desi chickpea. This is probably due to the fact that through staying in business for long time, experienced

traders are likely to have identified low-cost marketing channels that would allow them sell at lower prices, hence making them more competitive in the grain trading business. Price competitiveness is particularly important to the export market targeting the South Asian market where export demand is more sensitive to price changes. We also found that traders receive relatively lower prices when they sell larger volumes at any particular time. This may show that buyer who order large volumes get relatively good price discounts, and this seems to be particularly the case for Kabuli types. A 10% increase in volume leads to a 0.1% price discount. About 42% of the Desi and 33% of Kabuli chickpea volume was transacted with traders having long standing relationship with the sellers. The balance was transacted with new customers, indicating the relatively good impersonal nature of the chickpea market. Other things being equal, sellers who made their Desi chickpea transaction with their long standing customers seem to offer reduced prices compared to transactions made with new customers. This may be due to the fact that, for those who develop trusted contacts, the cost of searching a trading partner could be lower. In fact, as indicated by Gabre-Madhin (2001), market search costs are a function of the opportunity cost of traders' time, the time spent for searching and the amount of search labour. In case of Kabuli, frequency of transactions did not significantly affect price, perhaps indicating the relatively new nature of the Kabuli market in Ethiopia.

As would be normally expected, differences in chickpea prices between markets largely followed the expected differences between primary, secondary and tertiary markets, indicating a fairly clear price progression along the primary to the terminal market chain. For instance, other things being equal, Kabuli prices in the primary and secondary markets were 17.5 and 14.8% lower than prices in the tertiary markets respectively. The same pattern holds true for Desi where prices in the secondary markets are about 7% lower than prices in the tertiary markets. The prices are also lower in the primary markets, but this difference was not significant.

In competitive markets, the quality of the grain is a decisive factor in determining the price of the grain. When markets are relatively free from the problem of asymmetric information and when buyers are able to differentiate products according to observable quality parameters, the market is likely to offer a price premium for superior quality (Akerlof 1970; Fafchamps 2004). As discussed earlier, quality in chickpea marketing is considered a composite of various grain attributes such as colour, grain size, grain shape (shrivelled or not), uniformity, and extent of foreign matter. High grade Kabuli chickpea for instance is defined by the presence of high proportion of cream coloured and large size grain and low or absence of foreign matter and shrivelled seeds. Of the total Desi and Kabuli chickpea transacted 84 and 56% respectively were considered as superior grade (Grade 1). Other things being equal, superior quality Desi and Kabuli chickpeas sold for significantly higher

prices than lower quality grades. The overall price premium between the two prevailing quality grades was about 8.3%; the average price difference ranged from 5% for Kabuli to 7.3% for Desi chickpea. This confirms the earlier inferences drawn from simple statistical summaries (Table 15). However, a closer analysis of the quality–price relationship shows that the effect of quality on prices is significantly lower in the primary markets. This is true for both Desi and Kabuli markets, but more significant in the case of the former than the latter. The econometric results show that the quality premium in the primary markets is about 13 and 6% lower than the secondary and tertiary markets. This can also be seen from the results discussed in Table 15. While more research is needed to better understand the reasons for this, it may be logical to attribute the lower value of quality in the primary markets to problems of asymmetric information that make it difficult for buyers to ascertain grain quality when the grain is procured from smallholder farmers. This may also be attributed to lack of full information and awareness by the farmer of the relative importance of grain quality in the chickpea market, which seems to favour traders to gain higher prices and capture the quality effect through deliberate product differentiation as the grain moves towards the upper end of the value chain.

One important market trend observed in chickpea is that both Desi and Kabuli prices have increased continuously during the last few years. This was captured using a dummy variable to compare the prevailing prices during the different years. Compared to the 2005/06 chickpea crop and controlling for other factors, the prices for Desi and Kabuli chickpeas were about 14% lower during 2004/05 cropping seasons. As discussed earlier, the seasonal patterns in supply of chickpea often affect local prices significantly. Such effects were captured by using season dummy variables. In the regression models, the harvest season (January–March) represents the peak in local grain supply; the dry season (April–June) and the remaining months (July–December) corresponds to the rainy season and the time where grain supply is at lowest level. The results show a clear pattern of increasing prices as one moves away from the harvest season; compared to the season from July–December, both Desi and Kabuli prices are significantly lower during the remaining seasons, January–June. This price difference ranges from 5 to 13% for Desi and Kabuli types, respectively, indicating the potential to benefit from higher prices through temporal arbitrage by both producers and traders.

Another important factor is how the traders relate their own transaction costs into the price of the commodity. As discussed earlier, marketing costs are important in determining the size of the marketing margin (differential between buying and selling prices). We find a significant effect of marketing costs on prices received by the traders, clearly indicating that one strategy to enhance competitiveness of Ethiopian chickpea

exports is to reduce these costs. We also tested how prices may vary depending on the type of buyer in each market. The results show that after controlling for markets, season and the quality of the grain, the results show that prices offered by rural retailers/consumers, *woreda* retailers/consumers, *woreda* wholesalers, and urban wholesalers are 5 to 8% significantly lower than prices offered by processors, supermarkets and other urban retailers. This price difference seems to be relatively larger for Kabuli chickpea, ranging from 8 to 12%. At the aggregate level, the prices offered by the exporters were not significantly different from those offered by processors and urban retailers.

5.9 Availability of business services in chickpea marketing

Financial services

The surveyed traders indicated that credit availability problems were a major hurdle in expanding of the chickpea marketing business. Provision of credit both from formal and informal sources for purpose of grain trading is not a very regular and well established practice. During the study period, sampled traders at all market levels had limited access to both formal and informal credits. The result indicated that about 25% of the sample traders had access to credit for their grain trading business. This is composed of about 25% of the sample traders in the primary markets, 15% in the secondary markets and 27% in the tertiary markets (Table 19). Among the traders in the primary markets, who had access to credit, farmers' cooperatives operated in grain trading had a better access to credit than individuals operating in the same market. These cooperatives have a direct credit access from commercial banks through their union.

Table 19. *Access to credit for grain trading (% of respondents)*

Year[a]	Market type			
	Primary (N = 68)	Secondary (N = 14)	Tertiary (N = 40)	Total (N = 122)
Credit during 2004/05 (1997)	28	23	27	27
Credit during 2005/06 (1998)	25	15	27	25

a. Year in Ethiopian calendar in parenthesis.

As compared to other credit sources, banks play a relatively important role in extending credits particularly for traders in the tertiary markets and farmers' cooperatives (Table 20). Likewise for the traders in the secondary markets the Commercial Bank of Ethiopia is the sole source of credit. A good proportion of traders who got credit from different sources use the funds for purchasing multiple crops including chickpea, teff, lentil and wheat. Many traders like engaging in chickpea trade as they consider quick turn over in this crop compared to other staple crops mainly used in the domestic market.

Table 20. *Source of credit for grain trading (% of respondents)*

	Credit in 2004/05				Credit in 2005/2006			
	Primary	Secondary	Tertiary	**Total**	Primary	Secondary	Tertiary	**Total**
Bank	26	100	80	**52**	18	100	80	**47**
Relative/friend	0	0	10	**3**	0	0	10	**3**
Private lender	16	0	10	**12**	18	0	10	**13**
Union	58	0	0	**33**	64	0	0	**37**

Among the three market types, the average outstanding loan extended to traders in the tertiary markets was comparably higher, about ETB 2.3 to 6.6 million, than primary and secondary markets. This was consistent with the level of investment needed in trading large volumes in this market. The size of outstanding loan varied according to market level, size of business and source of credit. Some traders, about 10%, most of them from the tertiary markets, had access to funds from their family or relatives with zero rate of interest (Table 20).

The stated constraints in accessing credit are summarized in Table 21. In addition to the unavailability of the credit, the high rate of interest and the lack of collateral (mainly to traders in primary and secondary markets) were the main constraints for accessing credit. Some traders showed risk-aversion to obtaining credit. Even those who had thought about maintaining or expanding their grain trading operations and even those who had identified possible sources of credit explained that they were concerned about the implications of not being able to pay back their loan, showing the high degree of uncertainty that many traders face in the traditional grain trading business in the country. One strategy to enhance access to credit is to organize these small traders into a legally recognized traders association which could facilitate access to formal credit and other business services. Another important area that needs to be considered is provision of some low-cost insurance coverage to traders for the loan credit received from the banks.

Table 21. *Constraints for credit (% of respondents)*

	Market type			
	Primary	Secondary	Tertiary	Total
High interest	38	60	0	30
Fear that unable to repay	2	90	38	24
Lack of collateral	29	20	10	22
Enough financial capacity	9	0	14	9
Get money from family	40	0	10	26
Unavailable	20	0	5	13
Unnecessary (sufficient own capital)	0	0	29	8

Market information services

Many of the service markets supporting the chickpea value chains are underdeveloped. In general access to market information is extremely limited in the Ethiopian grain market (Gabre-Madhin 2001). The study indicated that differences in accessing market information for chickpea were related to size and type of markets. Traders in the primary and secondary markets had better information on seasonal production and supply conditions and farmers' cost of production and storage practices than traders in the tertiary markets (Table 22). Contrary to this, access to information about food safety issues, export markets, export quality standards, grading, labelling and certification issues were relatively better for traders at the upper end of the chickpea value chain. However, still such information is largely unavailable to most of these traders. Traders also indicated that they have relatively good understanding of local markets in their vicinity but know much less about prices, quality requirements and demand conditions in distant domestic markets.

Table 22. *Access to services for grain trading (% of respondents)*

	Desi chickpea				Kabuli chickpea			
	Primary	Sec-ondary	Tertiary	Total	Primary	Sec-ondary	Tertiary	Total
	N = 68	N = 14	N = 40	N = 122	N = 68	N = 14	N = 40	N = 122
Cost of production	82	75	3	37	80	75	0	49
Storage practices	82	8	14	27	80	17	8	31
Food safety issues	0	0	17	10	0	8	0	3
Local market information	100	100	97	98	100	92	92	94
Export market information	0	25	34	25	0	25	54	29
Export quality standards	0	8	34	21	0	8	46	20
Grading and labelling	0	0	24	13	0	8	23	11
Certification	0	0	24	13	0	0	23	9

Traders indicate that available market information was obtained from different sources. Information about cost of production seems to be a rough estimate of what the trader in local markets know about chickpea production. Traders do not actively collect information on farmer chickpea production costs, and seemed to suspect the validity of information provided by farmers. The same is true about production levels and expected supply of Desi and Kabuli types in each season. The exporters and large processors do not have any information in advance that would help them make strategic decisions in finalizing business plans. Information on market prices and outlets is often obtained from other traders, brokers or exporters, and sometimes from different local organizations. There is no trusted service provider on market conditions and trends for any of the crop

commodities. Some traders in the tertiary markets (and to some extent in the secondary markets) received some information (e.g. good storage practices, food safety, export market, export quality standards, grade and certification) from the offices of the Ministry of Agriculture and Rural Development (MoARD), Ethiopian Chamber of Commerce, Export Promotion Agency and Quality and Standards Authority of Ethiopia, and Ethiopian Pulses, Oilseeds and Spices Processors and Exporters Association. However, in general, except information about cost of production, storage practices and domestic market information, the availability of other services leave much to be desired in terms of developing a more efficient and integrated marketing system for chickpeas in the country.

5.10 Other limiting factors and opportunities

A summary of the key constraints faced by chickpea traders is summarized in Table 23. Unreliable and deficient supply, liquidity problems, lack of market information, price volatility and supply of low quality chickpea especially Kabuli targeted for export markets are some of the major limiting factors in the chickpea business. As previously noted chickpea is produced at small scale level. Given the growing demand in domestic and international markets, traders at all levels complain about low quality as well as unreliable and inadequate supplies to the market. The limited supply is particularly the case for Kabuli types, but this has shown a significant growth in the past couple of years as farmers adopted new varieties, and will be expected to grow even further in the future as the crop expands across the chickpea growing areas of the country.

Table 23. *Weakness/constraints of traders in chickpea marketing (% of respondents)*

	Desi chickpea				Kabuli chickpea			
	Primary	Secondary	Tertiary	Total	Primary	Secondary	Tertiary	Total
	N = 68	N = 14	N = 40	N = 122	N = 68	N = 14	N = 40	N = 122
Unreliable/shortage supply	30	23	46	33	40	54	39	42
Shortage of operating capital	67	46	54	61	54	46	62	54
Lack of market information	47	39	19	39	32	31	8	28
Price instability	8	54	58	26	22	15	39	24
Low product quality	16	31	42	24	14	0	46	17

In general, information about chickpea marketing practices is unevenly distributed with those traders who operated at secondary and tertiary markets have better access to information than traders at primary market level. This on the other hand indicated that information dissemination among market players at different market level is limited. This inadequate access by market participants to timely and accurate information about prices, quality–price relations, and demand patterns in various markets, has recently lead to highly speculative behaviour and extreme uncertainty in chickpea markets. Poor flow

of information on market relevant quality traits from tertiary markets and end users to farmers and traders in the primary markets is also leading to undervaluation of quality at the farm-gate, which may gradually crowd out suppliers of superior quality grain.

Shortage of operating capital limits the scale of individual trading business, leading to significant cost inefficiencies at all market levels. This is particularly important given the high economies of scale in this business. Very few traders reported access to formal credit, although some traders particularly from primary and secondary markets borrow informally at low or no interest from friends and family. As discussed above high costs for borrowed capital also increase the risks faced by traders and discourage borrowing.

While these constraints remain important bottlenecks for development of the private chickpea marketing system, the policy interest on commercialization of chickpea production and competitiveness in export markets open new opportunities for expanding the participation of the private sector at each point in the production, value addition and marketing value chain. The traders also expressed interest for increased participation and outlined several issues that show their strength and comparative advantage. The growing effort of traders to supply quality products, ability to assess the structure and functioning of the market, identifying and targeting productive areas that supply quality chickpeas, availability of warehouses, and ability to sell at relatively stable prices were stated as indicators of strength for some of the traders (Table 24). However, the low responses for many of the indicators clearly indicate the overall deficiencies in the chickpea trading system in the country.

Table 24. *Strength/opportunities of traders in chickpea marketing (% of respondents)*

	Desi chickpea				Kabuli chickpea			
	Primary	Sec-ondary	Tertiary	Total	Primary	Sec-ondary	Terti-ary	Total
	N = 68	N = 14	N = 40	N = 122	N = 68	N = 14	N = 40	N = 122
Supply quality product	65	38	57	60	57	50	67	58
Customer handling (stable price)	0	25	95	17	0	38	33	6
Able to assess the market condition	2	13	26	9	5	13	25	11
Identify areas having quality chickpeas	35	88	52	45	37	63	50	46
Enough warehouses	4	0	9	5	5	0	0	4

The constraints reported by the respondents clearly identify the policy relevant issues that need to be addressed in developing viable value chains and enhance the competitiveness of Ethiopian chickpea exports. This is particularly relevant given the extreme fluctuation

in the domestic price of chickpeas observed during the 2007 season and the lack of objective market information that leads to extreme speculation and pricing patterns in chickpea markets. There is also strong interest to improve the contractual relationship between processors, exporters and the farmers' union. This would enhance the opportunities to strengthen the existing weak linkages characterized by scepticism and mistrust, preventing exchange of information and partnerships needed in establishing well coordinated value chains.

6 Conclusion

Improvement in productivity and subsequent effective marketing of chickpea produce in potential chickpea producing areas such as Ada'a-Liben *woreda* can be a major milestone in the fight against poverty in the rural areas. As is the case for other crops, there is no doubt that there are many challenges associated with developing market opportunities and profitable value chains for chickpea. First and foremost is the need to secure a consistent supply of chickpea grain that meets required quality standards and quantity requirements as well as price and cost structures that make chickpea production economically viable to smallholder producers. This is critical in establishing a recognizable brand of high quality for Ethiopian chickpeas trusted by buyers in domestic and international markets. Improved market linkages that increase the volume and value of traded chickpea produce between rural agricultural households and the rest of the domestic, regional and international economy would benefit both smallholder producers and consumers. Reduced marketing costs resulting from development of enhanced market linkages have the potential for increasing farm-gate prices while reducing consumer prices. This can also improve competitiveness of Ethiopian chickpea exports as exporters now facing high domestic prices could supply the product at low cost.

Addressing these issues along the supply chain requires interventions at different levels, ranging from improving productivity, quality, reliability of supply, and the direct and indirect costs of marketing. Production of chickpea can be boosted using existing technologies such as improved chickpea cultivars and associated cultural practices. But there is a need to improve the availability of large-seeded Kabuli types and seed and input supply systems to smallholder producers. This is important for meeting desired quality standards in international markets. However, this study has shown that existing marketing systems in the country do not always value quality properly, especially at the lower end of the value chain. This makes it difficult for farmers to appreciate and internalize quality issues as prices may not always reward good behaviour in maintaining quality. There is a need for a more efficient marketing system that helps reduce transaction costs and create incentives for smallholder producers to adopt new technology for improving productivity and enhancing quality and reliability of supply. The complex and extended nature of value chains in chickpea markets along with pervasive asymmetric information prevents attainment of efficiency and may even crowd out reliable suppliers of high quality produce at reasonable prices.

Addressing these concerns is paramount in harnessing the unexploited growth opportunities that lie in the chickpea subsector. In the global trade arena, marketing is guided by increasingly stringent and sophisticated quality grades and standards

that countries must prepare themselves to comply with to become competitive in international high value markets. While improving viable and efficient market linkages is important in both domestic and export markets, there is a lack of knowledge and transparency in seasonal price patterns, price–quality relationships and seasonal market demand in alternative export markets. Lack of such reliable information has often led to extreme speculation and unwarranted pricing patterns and volatility in chickpea markets. Unfounded expectations on the side of producers and traders have led to breakdown of trust and relationship. Forward market contracts signed between the farmer cooperatives and exporters and processors alike have remained unfulfilled. As the old adage goes 'trust is difficult to build but easy to destroy'. Lack of effective policies for price stabilization and inadequate flow of information among market participants regarding potential markets, product pricing, product specification and quality–price relations are important constraints in the marketing system. The study has also found that inadequate horizontal and vertical linkages among chickpea market participants, limited participation in valued addition and processing and limited access to information, credit and related business services continue to stifle the marketing system, making it vulnerable to manipulation by few rent-seeking intermediaries and actors.

Based on these findings, we propose the following recommendations and suggestions for policy:

- Collaborative efforts are required to introduce appropriate technologies and market information systems that improve productivity and help meet quality and quantity requirements of different end-users in both domestic and international markets. This may require expanding the existing extension systems on agronomic practices by integrating issues on market information, market preferred varieties, and grain quality parameters.
- Establishing quality-based marketing systems that create self-enforcing incentives for producers to supply high quality produce is not, however, possible in situations where asymmetric information prevents farmers from receiving better prices for their produce. There is a need to address the low price premium for quality at the farm-gate and in the primary markets. This may first require formalizing the existing quality grades and providing information to smallholder farmers on how prices relate to quality grades in different markets and along the value chain. The traders should also offer fair, competitive and differentiated prices for products that differ in observable quality parameters. Market actors who deliberately defraud other buyers or sellers and tamper with quality traits through various means should face a penalty for their corrupt behaviour that distorts the functioning of markets.
- There should be a clear understanding of the need to develop enabling policy and institutional mechanisms that foster efficient and equitable functioning of markets. The excessive speculation and unwarranted pricing patterns have introduced so

much uncertainty into chickpea markets. In some cases, wholesalers and traders have not been able to export the Kabuli chickpeas bought at highly inflated prices that cannot be competitive in international markets. The Ethiopian grain enterprise and cooperatives may consider providing price stabilization functions by managing the disequilibrium in supply and demand that leads to excessive price fluctuations.

- There is a need for increased participation of the private sectors (including cooperatives) in strengthening business support services to traders along the value chain. This should include enhancing to the availability and dissemination of market information to all stakeholders involved in production, processing and marketing activities. Such business services and information should also include good practices in labelling, storage, product certification, demand creation, and provision of credit, especially to actors in the primary markets.
- The strength of market linkages between farmers and traders operating at the upper end of the value chain needs to be enhanced through better market linkages and development of mutually beneficial contractual arrangements. Better farmer–trader linkages would ensure reliable supply of good quality products and enable farmers to cushion themselves against widely fluctuating prices while guarantying an outlet for their surplus production. Appropriate institutional and legal frameworks are needed to stimulate the development of out-grower schemes and self-enforcing and flexible contracts based on objective assessment of market conditions on both sides (farmers and traders). The farmers' cooperatives/unions are instrumental in cultivating trust and establishing the missing link between the farming and business communities.
- There is a need for institutional innovations to reduce transaction costs through better coordination of marketing activities of smallholder farmers and increased exchange of information along the value chain. The corollary to this would be enhanced availability of better farm–to–market road links and transport and storage facilities.

References

Akerlof GA. 1970. The market for 'lemons': Quality and uncertainty and the market mechanism. *Quarterly Journal of Economics* 84(3):488–500.

Bejiga G, Eshete M and Anbessa Y. 1996. *Improved cultivars and production technology of chickpea in Ethiopia*. Debre Zeit Agricultural Research Center (DZARC), Debre Zeit, Ethiopia.

CSA (Central Statistical Agency). 2006. Federal Democratic Republic of Ethiopia. Statistical Abstract. 2005. CSA, Addis Ababa, Ethiopia.

Dadi L, Negassa A and Franzel S. 1992. Marketing maize and teff in western Ethiopia: Implications for policies following market liberalization. *Food Policy* 17(3):201–213.

Dadi L, Regasssa S, Fikre A and Mitiku D. 2005. *Adoption of chickpea varieties in the central highlands of Ethiopia*. Research Report 62. EARO (Ethiopian Agricultural Research Organization), Addis Ababa, Ethiopia.

Fafchamps M. 2004. *Market institutions in sub-Saharan Africa: Theory and evidence*. MIT Press, Cambridge, Massachusetts, USA. 541 pp.

Fafchamps M and Gabre-Madhin E. 2006. Agricultural markets in Benin and Malawi. *African Journal of Agricultural Economics* 1:67–94.

Fafchamps M and Hill RV. 2005. Selling at the farm-gate or traveling to the market. *American Journal of Agricultural Economics* 87(3):717–734.

Gabre-Madhin EZ. 2001. *Market institutions, transaction costs, and social capital in the Ethiopian grain market*. IFPRI Research Report 124. IFPRI (International Food Policy Research Institute), Washington, DC, USA. 44 pp.

Garderen KJV and Shah C. 2002. Exact interpretation of dummy variables in semi-logarithmic equations. *Econometrics Journal* 5:149–159.

Gebremeskel D, Jayne TS and Shaffer JD. 1998. *Market structure, conduct, and performance: Constraints on performance of Ethiopian grain markets*. Working Paper 8. Grain Marketing Research Project, Addis Ababa, Ethiopia. 60 pp.

Hubbard M. 1997. The 'New Institutional Economics' in agricultural development: Insights and challenges. *Journal of Agricultural Economics* 48(2):239–249.

de Janvry A, Fafchamps M and Sadoulet E. 1991. Peasant household behaviour with missing markets: Some paradoxes explained. *Economic Journal* 101:1400–1417.

Jones R, Freeman HA and Monaco GL. 2002. *Improving the access of small farmers in eastern and southern Africa to global pigeonpea markets*. Agricultural Research and Extension Network Paper 120. Overseas Development Institute, London, UK. http:/www.odi.org.uk/agren/.

Kaplinsky R and Morris M. 2000. *A handbook for value chain research*. IDRC (International Development Research Centre), Ottawa, Canada. [http://www.ids.ac.uk/ids/global/pdfs/vchnov01.pdf]

KIT, Faida, MaLi and IIRR. 2006. *Chain empowerment: Supporting African farmers to develop markets*. Royal Tropical Institute, Amsterdam; Faida Market Link, Arusha; IIAR (International Institute of Rural Reconstruction), Nairobi, Kenya.

Kydd J and Dorward A. 2004. Implications of market and coordination failures for rural development in least developed countries. *Journal of International Development* 16:951–970.

Mendoza G. 1995. A primer on marketing channels and margins. In: Scott GJ (ed), *Prices, products and people: Analyzing agricultural markets in developing countries*. Lynne Reinner Publishers, Boulder, London, UK. pp. 257–276.

Minten B. 1999. *Infrastructure, market access and agricultural prices: Evidence from Madagascar.* MSSD Discussion Paper 26. IFPRI (International Food Policy Research Institute), Washington, DC, USA. 45 pp.

Nabli MK and Nugent JB. 1989. The Institutional Economics and its applicability to development. *World Development* 17(9):1333–1347.

Negassa A and Jayne TS. 1997. *The response of Ethiopian grain markets to liberalization.* Working Paper 6. Grain Marketing Research Project, Addis Ababa, Ethiopia.

Parker DD and Zilberman D. 1993. Hedonic estimation of quality factors affecting the farm-retail margin. *American Journal of Agricultural Economics* 75:458–466.

Poulton C, Kydd J and Doward A. 2006. Overcoming market constraints on pro-poor agricultural growth in sub-Saharan Africa. *Development Policy Review* 24(3):243–277.

Randolph T and Ndung'u L. 2000. Gender and transaction costs: A conjoint analysis of choice of livestock health services among smallholder dairy farmers in Kenya. Background paper for poster presentation at the XXIV Congress of the IAAE, Berlin, 18th–24th August 2000.

Rosen S. 1974. Hedonic prices and implicit markets: Product differentiation in pure competition. *Journal of Political Economy* 82:34–55.

Scott GJ. (ed). 1995. *Prices, products and people: Analyzing agricultural markets in developing countries*. Lynne Reinner Publishers, Boulder, London, UK. 517 pp.

Shiferaw B, Jones R, Silim S, Teklewold H and Gwata E. 2007. *Analysis of production costs, market opportunities and competitiveness of Desi and Kabuli chickpeas in Ethiopia.* IPMS Working Paper 3. ILRI, Addis Ababa, Ethiopia. 48 pp.

Shiferaw B, Obare G and Muricho G. 2006. *Rural institutions and producer organizations in imperfect markets: Experiences from producer marketing groups in semi-arid eastern Kenya.* ICRISAT Socio-economics and Policy Working Paper 23. ICRISAT (International Crops Research Institute for the Semi-Arid Tropics), Patancheru, India. 79 pp.

Annex 1. Proportion of chickpea bought by various traders in different markets (January 2005–April 2006).

Crop	Location crop bought	Type of trader (% bought)										
		Rural assembler	Rural retailer	*Woreda* wholesaler	*Woreda* retailer	Urban wholesaler	Urban retailer	Supermarket	Processor	Grain exporter	Processed exporter	Union/cooperatives
Total chickpea	Ada'a-Liben	83.8	100.0	55.4	27.6	5.7	0.0	0.0	0.0	0.7	0.0	77.3
	Akaki	6.2	0.0	0.0	0.0	0.2	0.0	94.0	0.0	11.4	0.0	13.4
	Gimbichu	8.3	0.0	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.2
	Debre Zeit	1.6	0.0	38.9	72.4	39.2	86.4	0.0	0.1	35.0	24.0	0.0
	Addis Ababa	0.0	0.0	0.0	0.0	0.1	7.5	4.5	99.8	13.1	10.0	0.0
	Nazareth	0.0	0.0	0.0	0.0	0.0	6.2	1.4	0.0	4.9	16.0	0.0
	Becho	0.0	0.0	0.0	0.0	14.2	0.0	0.0	0.0	10.7	40.0	0.0
	Mojo	0.0	0.0	0.0	0.0	7.4	0.0	0.0	0.0	1.4	0.0	0.0
	Ejere	0.0	0.0	0.0	0.0	4.8	0.0	0.0	0.0	0.0	0.0	0.0
	Welonkomi	0.0	0.0	0.0	0.0	4.9	0.0	0.0	0.0	6.1	0.0	0.0
	Gojjam	0.0	0.0	0.0	0.0	10.2	0.0	0.0	0.0	4.5	0.0	0.0
	Butajira	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0
	Dessie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0
	Gondar	0.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0	2.6	0.0	0.0
	Beke	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Minjar	0.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0	1.5	0.0	0.0
	Tsedele	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	10.0	0.0
	Woliso/Welkite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.0
	Ambo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
	Alemtenna	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total amount bought, (100 kg)		30,102	3763	26,173	563	78,163	795	1276	38,787	41,102	5000	8126

Crop	Location crop bought	Type of trader (% bought)										
		Rural assembler	Rural retailer	Woreda wholesaler	Woreda retailer	Urban wholesaler	Urban retailer	Supermarket	Processor	Grain exporter	Processed exporter	Union/ coopertives
Desi	Ada'a-Liben	85.8	100.0	55.7	25.4	6.5	0.0	0.0	0.0	1.0	0.0	0.0
	Akaki	3.8	0.0	0.0	0.0	0.2	0.0	96.2	0.0	11.2	0.0	0.0
	Gimbichu	9.1	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Debre Zeit	1.3	0.0	40.0	74.6	30.8	87.2	0.0	0.1	24.7	26.7	0.0
	Addis Ababa	0.0	0.0	0.0	0.0	0.1	6.6	1.3	99.8	17.3	11.1	0.0
	Nazareth	0.0	0.0	0.0	0.0	0.0	6.2	2.6	0.0	6.4	17.8	0.0
	Becho	0.0	0.0	0.0	0.0	15.9	0.0	0.0	0.0	14.1	44.4	0.0
	Mojo	0.0	0.0	0.0	0.0	8.4	0.0	0.0	0.0	1.9	0.0	0.0
	Ejere	0.0	0.0	0.0	0.0	5.4	0.0	0.0	0.0	0.0	0.0	0.0
	Welonkomi	0.0	0.0	0.0	0.0	5.6	0.0	0.0	0.0	8.0	0.0	0.0
	Gojjam	0.0	0.0	0.0	0.0	11.7	0.0	0.0	0.0	3.3	0.0	0.0
	Dessie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0
	Gondar	0.0	0.0	0.0	0.0	6.9	0.0	0.0	0.0	3.4	0.0	0.0
	Minjar	0.0	0.0	0.0	0.0	8.1	0.0	0.0	0.0	2.0	0.0	0.0
	Tsedele	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0
	Woliso/Welkite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	0.0	0.0
	Ambo	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
	Alemtenna	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Total amount bought, (100 kg)		21,136	2714	18,518	485	68,411	788	624	38,783	31,202	4500	3937

Crop	Location crop bought	Type of trader (% bought)										
		Rural assembler	Rural retailer	Woreda wholesaler	Woreda retailer	Urban wholesaler	Urban retailer	Supermarket	Processor	Grain exporter	Processed exporter	Union/ coopertives
Kabuli		79.2	100.0	54.8	41.3	0.0	0.0	0.0	0.0	0.0	0.0	56.0
	Akaki	11.9	0.0	0.0	0.0	0.0	0.0	92.0	100.0	12.1	0.0	26.1
	Gimbichu	6.5	0.0	8.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.9
	Debre Zeit	2.4	0.0	36.4	58.7	97.8	0.0	0.0	0.0	67.7	0.0	0.0
	Addis Ababa	0.0	0.0	0.0	0.0	0.0	100.0	7.6	0.0	0.0	0.0	0.0
	Nazareth	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0
	Becho	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0
	Gojjam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.5	0.0	0.0
	Butajira	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	0.0	0.0
	Bale	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	Tsedele	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0
	Woliso/Welkite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.7	0.0	0.0
Total amount bought, (100 kg)		8966	1048	7655	78	9752	7	652	4	9900	500	4190

Annex 2. Amount of chickpea bought by season (% of chickpea bought).

	Rural assemblers	Rural retailers	*Woreda* whole-saler	*Woreda* retailer	Urban whole-saler	Urban retailer	Super-market	Processor	Grain exporter	Processed exporter	Union/ cooperatives
January	18.4	17.4	35.4	33.8	14.2	32.3	30.1	13.0	5.7	4.0	32.9
February	17.2	16.3	30.3	23.1	29.8	17.9	2.4	7.4	43.2	16.0	34.9
March	16.0	15.5	15.8	11.8	28.1	13.7	1.0	11.6	39.6	50.0	24.2
April	12.0	12.7	1.2	0.7	0.3	0.9	15.5	0.1	0.0	0.0	0.6
May	2.4	3.1	0.2	0.2	10.1	2.6	0.5	1.2	11.6	20.0	0.2
June	6.5	6.3	5.5	3.1	0.7	1.1	0.9	17.0	0.0	0.0	0.1
July	6.2	5.9	3.2	2.6	8.4	6.4	15.8	9.0	0.0	0.0	0.0
August	6.0	5.8	1.7	0.0	3.5	0.7	0.9	18.3	0.0	0.0	0.1
September	3.9	4.2	0.1	0.0	0.0	0.0	15.5	3.9	0.0	0.0	0.0
October	3.8	4.1	0.0	0.0	0.4	0.2	0.9	9.4	0.0	10.0	0.0
November	3.7	4.3	0.0	0.0	0.0	0.0	0.9	5.6	0.0	0.0	0.0
December	3.8	4.4	6.6	24.8	4.6	24.1	15.5	3.4	0.0	0.0	6.8
Total bought, 100 kg	57,366	6224	26,134	578.5	67,548	816.5	1372	34,282	38,862	5000	14,869