

Analysis of production costs, market opportunities and competitiveness of Desi and Kabuli chickpeas in Ethiopia



This working paper series has been established to share knowledge generated through Improving Productivity and Market Success (IPMS) of Ethiopian Farmers project with members of the research and development community in Ethiopia and beyond.

IPMS is a five year Project funded by the Canadian International Development Agency (CIDA) and implemented by the International Livestock Research Institute (ILRI) on behalf of the Ethiopian Ministry of Agriculture and Rural Development (MoARD).

Following the Government of Ethiopia's rural development and food security strategy, the IPMS project aims at contributing to market-oriented agricultural progress, as a means for achieving improved and sustainable livelihoods for the rural population. The project will contribute to this long-term goal by strengthening the effectiveness of the Government's efforts to transform agricultural production and productivity, and rural development in Ethiopia.

IPMS employs an innovation system approach (ISA) as a guiding principle in its research and development activities. Within the context of a market oriented agricultural development, this means bringing together the various public and private actors in the agricultural sector including producers, research, extension, education, agri-businesses, and service providers such as input suppliers and credit institutions. The objective is to increase access to relevant knowledge from multiple sources and use it for socio-economic progress. To enable this, the project is building innovative capacity of public and private partners in the process of planning, implementing and monitoring commodity based research and development programs.

Most of the project's activities are taking place in selected Pilot Learning *Woredas* (PLWs). The smallholder farmers and pastoralists in the PLWs are expected to increase market oriented production and productivity through the project's interventions during the project life. The project staff and partners will study this process through action research and learning. Some complementary focused studies are also undertaken by the project and its partners, which help to understand the context and determine key factors influencing the adoption and impact of the interventions. The results of all these studies and some important concepts, tools, methods and approaches developed will be published in the working paper series and will also be disseminated through other appropriate channels.

The intended users of the research outputs are government, non-governmental and private sector and donor organizations that are involved in market oriented development. They may use these learnings in their efforts to scale out this development process to other *woredas* in the country. Some lessons learned are also expected to be relevant for possible use in market orientated agricultural development efforts in similar contexts outside Ethiopia.

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Bekele Shiferaw, Richard Jones, Said Silim, Hailemariam Teklewold and Eastonce Gwata*

* Corresponding author: e-mail: b.shiferaw@cgiar.org

Postal address: ICRISAT, P. O. Box 39063-00623, Nairobi, Kenya



Authors' affiliations

Bekele Shiferaw, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Regional Office for Eastern and Southern Africa, Nairobi, Kenya

Richard Jones, ICRISAT, Regional Office for Eastern and Southern Africa, Nairobi, Kenya

Said Silim, ICRISAT, Regional Office for Eastern and Southern Africa, Nairobi, Kenya

Hailemariam Tekelewold, Ethiopian Institute of Agricultural Research (EIAR), Addis Ababa, Ethiopia

Eastonce Gwata, ICRISAT, Regional Office for Eastern and Southern Africa, Nairobi, Kenya

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Acronyms

DZARC	Debre Zeit Agricultural Research Centre
EFU	Erer Farmers' Union
EIAR	Ethiopian Institute of Agricultural Research, formerly Ethiopian Agricultural Research Organization (EARO)
EPOSPEA	Ethiopian Pulses, Oilseeds and Spices Processors and Exporters Association
ESE	Ethiopian Seed Enterprise
ETB	Ethiopian birr
FAO	Food and Agriculture Organization of the United Nations
ICARDA	International Center for Agricultural Research in the Dry Areas
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
ILRI	International Livestock Research Institute
IPMS	Improving Productivity and Market Success of Ethiopian Farmers
PLW	Pilot Learning <i>Woreda</i>
QSAE	Quality and Standards Authority of Ethiopia
USD	United States dollar

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1 Introduction

Chickpea is a high-value crop that is adapted to deep black soils in the cool semi-arid areas of the tropics, sub-tropics as well as the temperate areas (e.g. Canada and Australia). Chickpea is the most important leguminous food grain in the diets of people in South and West Asia and northern Africa. It is grown on about 10.3 million hectares worldwide and its annual production averages 7.9 million tonnes. India alone accounts for 63% of the total chickpea growing area. The other major chickpea producing countries are Pakistan, Iran, Canada, Turkey, Ethiopia, Mexico and Syria (Annex 1). Because chickpea is generally grown in drought prone areas, and derives most of its water requirements from residual stored soil moisture rather than from rainfall, chickpea yields tend to trail those of cereals and other legumes cultivated in more favourable areas (Joshi et al. 2001; Shiferaw et al. 2004).

There are two types of chickpea; Desi, traditionally grown near the equator predominates in South Asia and East Africa, and Kabuli which is a large seeded type suited to the more temperate climates. The Desi types are predominantly consumed in the diets of South Asia. Hence, the surplus production of Desi types from East Africa commonly finds a market in India, Pakistan and Bangladesh. The Kabuli types are most preferred in high-value markets of the Middle East, Western Europe and North America. The Kabuli types usually fetch significantly higher prices in international export markets. The major producers of Kabuli types are Mexico, Canada, Syria, Iran and Spain. Australia has traditionally grown Desi types, but two Kabuli types resistant to *Ascochyta* blight, a disease that has been devastating the crop, have been recently released for production in South Australia, New South Wales, Victoria and West Australia.

The diverse biophysical and agro-climatic conditions in Ethiopia make it very suitable for growing a number of pulses and legume crops. Chickpea is one of the most important pulses grown widely across the highlands and semi-arid regions of the country (Bejiga et al. 1996; Dadi et al. 2005). Chickpea is rich in proteins and serves as an economical source of nutritious food for many poor households. Because of its ability to withstand drought stress, smallholder farmers in Ethiopia grow chickpea at the end of the main rainy season using residual soil moisture. This permits farmers to grow a second crop and secure an additional source of income and protein through efficient use of the residual moisture in black soils at the end of the rains. This improves food security for the household while the nitrogen fixed by the crop enriches soil nutrients for the subsequent cereal crops (*tef* and wheat) that follow in the rotation.

The crop is widely grown in over 24 districts (*woredas*) of the country that contain deep black soils and is highly preferred by cash-constrained farmers who cannot afford to buy

commercial fertilizers for cereals that are rotated with chickpeas. The major growing areas in the country include Eastern Showa (Ada'a-Liben, Akaki, Gimbichu, Lume, Minjar), Western Showa (Betcho, Tulubolo, Butajera and Wolkite), Gondar (Maksegnit, Dembia, Addis Zemen), Gojjam (Bichena, Mota, Birsheleko), and Welo (Dessie Zuria). This makes the crop highly integrated into the farming system, pro-poor and highly ecologically friendly for growing in many areas that suffer from soil nutrient depletion. Recent data from Ethiopian sources shows that about 185 thousand hectares of land were cultivated under chickpea and the total production reached about 180 thousand tonnes, making Ethiopia the largest producer of chickpea in Africa and the 6th largest worldwide (MoARD 2003).

Despite its high potential for improving the incomes of the rural poor, the crop has not been fully exploited. Several factors have contributed to this. First, the available high-yielding varieties with market-preferred traits have not reached farmers on a large scale and hence, the productivity of the crop has remained to be one of the lowest in the world. Second, the local landraces grown by farmers do not meet the quality and quantity requirements preferred to some extent by domestic but especially international markets. This means that chickpea produced by small-scale farmers is limited in volume and quality, making it less tradable in international and regional markets implying that it is largely consumed on the farm. In Ada'a-Liben *woreda*, where a number of primary co-operatives have emerged and farmers have been contracted to multiply seeds, less than 5% of the farmers in 2004/05 used improved and market-preferred chickpea varieties.¹

Insufficient seed production and marketing systems that limit availability of quality seeds of improved varieties to smallholder farmers is a major limiting factor for adopting new varieties, especially the Kabuli types. Farmers in Ada'a-Liben district also often cite widespread theft during the green stage and lack of credit for buying the improved seeds. The latter constraint is important particularly for poor households since chickpea seed requirements (for instance of Kabuli types) exceed 100 kg/ha and the prices are invariably higher than for grain. In order to create enabling and conducive conditions for the uptake of profitable varieties, there is a need to enhance farmers' access to essential input (including credit) and output markets and information about complementary chickpea technologies.

Ada'a-Liben *woreda* has good soils and agro-climatic conditions for expanding the production of chickpeas. The district was perhaps one of the first (along with Gimbichu and Akaki) to produce high-value Kabuli types. However, the production of Desi types

1. Owing to the intensive efforts of the farmer co-operatives in seed production and marketing, the proportion of farmers growing improved Kabuli and Desi varieties is expected to have grown significantly. This effort is supported and facilitated by research and development partners operating in the district.

that primarily constitute the domestic and export market for Ethiopian chickpeas, overshadowed the production of Kabuli varieties. Given the low yields, the marketed surplus is small and most of the Ethiopian chickpea is traded domestically. In recent years, Ethiopia's export of Desi chickpeas has been growing partly due to adverse growing conditions in Australia (*Ascochyta* blight) and droughts in South Asia. The market is characterized by small volumes, high transactions costs, lack of grading and quality control systems, and severe lack of market information, especially for export demand and prices. As a result Ethiopia is a price-taker vulnerable to over-supply in international markets where the Ethiopian crop has not developed full reputation for quality.

This study was conducted to examine the existing conditions in relation to production and marketing of chickpeas and outlines the major technological and institutional constraints for harnessing market opportunities in the chickpea sub-sector. The study determined variety introduction, market conditions and seed delivery systems in Ada'a-Liben *woreda*. This district is one of the major chickpea growing areas in which new market-preferred and high-value Kabuli types are being tested and promoted.

The paper is organized as follows. Section 2 presents the research process and methods. This is followed by discussion of production trends, available technologies, costs and opportunities for chickpeas. An overview of the structure and organization of the chickpea marketing system is given in Section 4. Section 5 presents market conditions with emphasis on opportunities for Kabuli exports, quality requirements, grading systems, competitiveness of smallholder producers, and existing potentials in domestic markets. The final section summarizes the key findings and highlights issues for policy and future research.

2 Research process and methods

This study is being undertaken as part of ICRISAT's collaboration with IPMS/ILRI in improving productivity and market access for chickpeas with a case study in one of the ten selected Pilot Learning *Woredas* (Ada'a-Liben *woreda*). In preparation for this study, ICRISAT has been involved in pre-project expert consultations, workshops and training programs. Subsequently, a collaborative project was developed in three areas: improving seed delivery systems, evaluation and promotion of new varieties, and improving market access and competitiveness of smallholder Kabuli growers. This is being implemented in Ada'a-Liben Pilot Learning *Woreda* (PLW) of the IPMS project.

In 2005 and 2006, ICRISAT in collaboration with the Ethiopian Institute of Agricultural Research (EIAR) and the IPMS–Ethiopian farmers project has completed diagnostic studies on the structure of the chickpea marketing system and production costs, the seed supply system and production conditions and technological opportunities for Kabuli chickpeas in Ada'a-Liben *woreda*. The study is being conducted in collaboration with Debre Zeit Agricultural Research Center (DZARC) of the EIAR. The study plans to accomplish the following outputs:

- analysing the chickpea marketing chain of Ada'a-Liben *woreda*, including possible improvements in light of emerging market opportunities and capacity building needs
- assessing the existing and emerging seed supply system, including recommendations for improvements and capacity building
- performance evaluation of the chickpea production system based on the newly introduced Kabuli types, including recommendations for improvements.

The study has adopted a number of alternative formal and informal approaches for generating qualitative and quantitative data. This includes extensive consultations with private and public sector enterprises and research and development (R&D) institutions as well as a survey of the market-chain for chickpeas. This is being complemented by farmer group discussions and key informant surveys in selected areas of the *woreda*. The ICRISAT team visited a number of public institutions and private enterprises including Ethiopian Pulses, Oilseeds and Spices Processors and Exporters Association (EPOSPEA), EIAR, Ethiopian Seed Enterprise (ESE) and others. The field visit to Debre Zeit included discussions with a group of chickpea farmers in Godino and Ude primary co-operatives. Some of the field visits coincided with the planting season for chickpeas where farmers were in the process of making variety choice and planting decisions. The IPMS field staff joined in most of the field visits, discussions and consultations with partners and key informants. The field visits carried out in Ethiopia and the different institutions consulted for this study are summarized in Annex 4.

The fieldwork and consultations with various stakeholders was instrumental in:

- a) understanding the structure of production and marketing of chickpeas in the country
- b) assessing the performance of input delivery and seed supply systems
- c) prioritizing planned interventions and developing collaborative work plans with initial emphasis on:
 - (i) analysing market opportunities and the supply chain for Kabuli
 - (ii) assessing the evolving seed supply system for chickpeas and
 - (iii) analysing production conditions, constraints, opportunities and technology diffusion strategies for Kabuli chickpeas.

Understanding the structure and performance of the chickpea marketing system would require data on volumes, transaction costs, and marketing margins along the supply chain and through alternative marketing channels. The supply chain survey was undertaken during the first half of 2006. The survey included a sample of value chain actors at three levels: nine primary rural markets in Ada'a-Liben district, secondary markets (Debre Zeit town and farmers' union) and tertiary markets (Nazareth and Addis Ababa). The survey included a total of 122 market actors along the supply chain, ranging from rural assemblers and retailers to urban wholesalers, retailers, processors and exporters. This included a total of 68 traders from 9 primary markets, 14 traders from secondary markets and 40 traders from tertiary markets. To capture the major primary markets in Ada'a-Liben, the survey was conducted in nine major rural markets representing the major chickpea growing peasant associations and sub-units in the district.

To improve accuracy of data and for triangulation purposes, at least three traders were interviewed from each group of assemblers, retailers, wholesalers, processors, and exports in each market. Data were collected through semi-structured instruments and informal methods using trained enumerators. Given the skill requirements needed for understanding issues in secondary and tertiary markets, a trained economist and market survey specialist from EIAR were used to administer the survey. Data collected included information on trader assets and experience; market networks and use of agents; the origin and destinations for grain bought and sold; the season, quantity, quality and prices for the grain bought and sold; marketing and transaction costs; availability and access to various business services; and constraints and opportunities in chickpea marketing. Traders were reluctant to provide data on some important questions, making it difficult to understand and quantify certain aspects of the supply chain that affect the performance of the market systems.

On the seed systems development, additional surveys are planned to investigate the performance of alternative farmer-based seed multiplication systems in Ada'a-Liben

woreda. The variety introduction work is planning to evaluate the performance of new varieties *vis-à-vis* old varieties in terms of agronomic yields, tolerance to biotic stress, and costs of production. This report brings together some of our initial findings from all the three areas of collaboration along with some recommendations for action. Results from the ongoing market studies are expected to provide the necessary information to fill the remaining gaps in this report.

3 Production of Desi and Kabuli chickpeas

3.1 Production trends and opportunities

Ethiopia has suitable agro-climatic conditions for production of both Desi and Kabuli type chickpeas. But, the country has traditionally grown Desi chickpeas both for consumption and sale. Although the Food and Agriculture Organization of the United Nations (FAO) database indicated the recent total area cultivated under chickpeas in Ethiopia at about 170 thousand hectares (Annex 1), the actual figure is likely to be close to 200 thousand hectares (FAO 2005). MoARD (2003) estimated the total annual production to be around 180 thousand tonnes (Table 1). Chickpeas are grown with the residual end of season soil moisture in Vertisol areas where water-logging hinders agricultural practices at the height of the rainy season. The crop is traditionally grown with minimal external inputs and does not require thorough land preparation like for cereals. Given the high cost of fertilizers, cereal rotations with nitrogen-fixing chickpeas have traditionally been used for improving the productivity of the following cereal crop.

Table 1. *Production and marketing of chickpeas in Ethiopia*

Year	Production (t)	Traded in domestic markets (t)	Total production (%)	Exported (t)	Total production (%)	Value of exports (USD)	Value (USD/t)
1997	129,588	129,555	99.97	33	0.03	17,000	515.15
1998	137,133	137,073	99.96	60	0.04	31,000	516.67
1999	138,837	138,810	99.98	27	0.02	14,000	518.52
2000	164,627	164,525	99.94	102	0.06	59,000	578.43
2001	176,313	147,519	83.67	28794	16.33	4,147,813	144.05
2002	179,821	130,992	72.85	48829	27.15	14,771,412	302.51

Source: Enhanced based on data compiled by MoARD (2003).

Whereas some small-seeded Kabuli type varieties have been released for cultivation since the mid 1970s (Table 2), Kabuli types are just beginning to be grown in some areas and are new in domestic markets (Dadi et al. 2005). Along with the renewed focus on market-led agricultural development and the ongoing effort to increase export of tradable commodities, the better market opportunities and higher prices seem to have increased the much needed policy attention for Kabuli types. The traditional Desi varieties are small-seeded and are mainly traded locally because international markets favour larger-seeded Kabuli varieties. The average yields are low, but higher than those in the rest of Africa, perhaps due to the good soils and growing conditions for the crop in the highlands of Ethiopia (Shiferaw et al. 2004).

Table 2. Chickpea varieties released in Ethiopia

Variety	Year of release	ICRISAT/ICARDA code	On-farm yield potential (t/ha)	Type	Market traits			Agronomic traits (duration and pest, disease resistance)
					Colour	100 seed weight (g)	Size in mm	
DZ-10-04	1974	–	1.4	Kabuli	Cream white	10.2	2–3	Medium duration
DZ-10-11	1974	–	1.9	Desi	Light brown	13.0	3–4	Medium duration
Dubie	1978	–	1.7	Desi	Grey	22.0	5–6	Early maturing
Marye	1986	K850*F378	2.3	Desi	Brown	25.5	5–6	Early maturing, fusarium resistant
Worku (DZ-10-16-2)	1994	ICCL 82104	2.9	Desi	Golden	33.0	7–8	Medium duration, fusarium resistant
Akaki (DZ-10-9-2)	1995	ICCL82106	2.6	Desi	Brown	21.0	7–8	Short duration, fusarium resistant
Shasho	1999	ICCV 93512	2.0–3.2	Kabuli	Cream white	29.9	6–7	Short duration, fusarium resistant
Arerti	1999	FLIP 89-84C	1.8–3.7	Kabuli	Cream white	25.7	6	Short duration, fusarium resistant
Chefe	2002	ICCV 92318	1.8–3.6	Kabuli	Cream white	27.7–39.6	6	Short duration, fusarium resistant
Teji	2005	FLIP 97-266C	2.0–3.5	Kabuli	Cream white	38.1	8–9	Short duration, fusarium resistant
Ejeri	2005	FLIP 97-263C	1.5–3.5	Kabuli	Cream white	37.4	8–9	Short duration, fusarium resistant

Sources: Bejiga et al. (1996), ESE (2001) and Dadi et al. (2005). On-farm results not available for new varieties.

With increasing awareness of the structure and preferences in international markets (especially Europe and North America), and the agro-climatic suitability of the Ethiopian highlands for growing Kabuli types, Ethiopia is taking initial steps to increase the production of Kabuli chickpeas. However, large-seeded types that are more preferred in international markets have been released for cultivation in Ethiopia only recently and are relatively unknown amongst local farmers and the trading community. Given the high interest to promote the production and export of Kabuli varieties, it is very important to understand the agronomic and other factors that affect the production and marketing of Kabuli chickpeas and the competitiveness of smallholders in domestic and international markets. Obviously, farmers would only switch to Kabuli types if the new varieties are more profitable than Desi types and find a reliable market outlet for their produce.

The availability of improved Kabuli varieties from the international agricultural research centres (ICRISAT and ICARDA) has facilitated the release of four varieties since the late 1990s (Table 2). This includes Shasho (ICCV93512), Arerti (FLIP 89-84C), Chefe (ICCV-92318) and Habru (FLIP 88-42C). These varieties are largely white-cream coloured and have a 100 seed weight ranging from 25–34 g and a grain size of 6–8 mm. Colour and

size are important market traits for chickpeas. Although Shasho and Arerti (now widely grown in Ada'a-Liben and neighbouring *woredas*) are relatively small and may not fetch a premium in export markets, they have higher prices and better demand than Desi types, indicating a good potential for promoting export of these commodities. During 2005, the DZARC has released two new Kabuli varieties with larger seed sizes. These include Teji (FLIP97-266C) and Ejeri (FLIP97-263C) with an average 100 seed weight of 38.1 and 37.4 g and a grain size ranging from 8–9 mm. When the seeds for these varieties are multiplied and made available to growers, it would open new opportunities for Ethiopian chickpea farmers and exporters.² Both are resistant to Fusarium wilt. If the two varieties do well under farmers' growing conditions and under the incidence of diseases (root rot and blight) and pests (pod borer), these varieties would further enhance the competitiveness of Kabuli exports from Ethiopia. In collaboration with ICRISAT, DZARC has already initiated on-farm demonstrations and farmer participatory agronomic evaluation of all Kabuli varieties in Ada'a-Liben *woreda*.

Ada'a-Liben *woreda* not only has deep black soils that are suitable for growing chickpeas, but also serves as the base for the nationally co-ordinated chickpea improvement program led by the DZARC. The DZARC has its own extension department that is involved in training farmers in new management and agronomic practices and popularizing newly released varieties. Discussions with DZARC have shown that a number of farmers from Ada'a-Liben have been trained in best practices in Kabuli production, including pest and disease management. The Erer Union which is composed of Primary Co-operatives from the three *woredas* (Ada'a-Liben, Akaki and Gimbichu) has also received breeder and pre-basic seeds for Shasho, Arerti and Chefe from DZARC and multiplied them over a period of two seasons using a selected group of contracted farmers across Ada'a-Liben *woreda*. For the 2005–06 production year, the Union had procured 500 t of seed for Shasho and Arerti varieties. About half of this has already been distributed to Primary Co-operatives for distribution to member farmers.³ If all the seeds are planted, at the rate of 130 kg/ha seeding rate, some 3845 ha of land can be planted in the three *woredas* with Kabuli chickpeas. With an average yield of 2 t/ha this would mean about 7700 t of Kabuli grains produced in early 2006. The availability of a larger volume to the Union is attractive to potential exporters that require sizable quantities for their shipments. One should note that although Ada'a-Liben is the selected PLW for IPMS,

2. The Ethiopian Seed Enterprise (ESE) has recently started producing and marketing of improved chickpea varieties in Ethiopia. However, much more needs to be done to meet the growing demand. Addressing the seed problem requires participation of breeders, seed producers, seed enterprises and extension agencies. There is an increasing need for stronger partnerships between EIAR, ESE, farmer co-operatives, and rural agro-dealers for production, wider distribution and marketing of improved seeds.

3. Most of the remaining balance has been sold to a South African based grain export company. This was possible through linkages facilitated through action research by ICRISAT and IPMS. This would represent the first export of Ethiopian Kabuli chickpeas.

Erer Union that deals with Kabuli chickpeas works with two additional *woredas* (Akaki and Gimbichu) and the seeds are being distributed to all the three *woredas*.

Discussions with farmers and farmer groups have indicated that a number of factors could determine the adoption of the new varieties in Ada'a-Liben and the adjoining *woredas*. In addition to improving the market linkages and the availability of seed, it would be useful to determine the response of the varieties to pests and diseases prevalent in the area and phosphorous fertilizer. Crop management practices including row-planting, weed control, optimal seeding depth and rate would assist in improving the yield.

3.2 Production costs and profitability

The necessary condition for promotion and wider adoption of Kabuli chickpeas is to understand their production costs and potential relative profitability (with respect to other competing crops for end-of-season planting and Desi types). In an effort to understand farmer perceptions, production costs and disease and pest pressures under farmer conditions, discussions were held with a group of key-informant farmers in Godino and Ude areas who have been involved in producing Kabuli chickpeas during the past two seasons through contractual arrangements with the Union. The farmers were asked to estimate the labour, animal power, seed, pesticide and other costs needed for producing Kabuli chickpeas. They also provided information on realized yields for Shasho and Arerti varieties and the rental value of land in local factor markets. Table 3 shows these preliminary production costs per *kert* (about 0.25 ha) as estimated by the group of farmers. The estimated cost of production is 892.6 Ethiopian birr (ETB)⁴ per *kert* or about ETB 3570.4/ha. Assuming a yield level of 2.4 t/ha under good management, this implies a production cost of ETB 148.76 per quintal.

Although the data need to be verified through household surveys and on-farm agronomic assessments, it shows high production costs in growing Kabuli chickpeas. The farmers also indicated a yield level for the new varieties ranging between 2 and 2.4 t/ha, the upper rate realized under good management. One of the important costs that may be avoided as more farmers grow the new varieties (and is not incurred when Desi types are grown) is the cost of protecting fields from thieves, especially at night, which now costs farmers ETB 150 per *kert* or ETB 25 per quintal produced. Given the rental value of land of ETB 400/*kert* for good quality land, the cut off rate of return per *kert* has to be about ETB 400/*kert* from growing any crop. Under the estimated cost of ETB 3570.4/ha, in order for the farmer to reach this level of return from growing Kabuli chickpeas and assuming an average yield level of 2.4 t/ha (under good management), the minimum

4. In January 2007, USD 1 = ETB 8.7757.

price needs to be about ETB 215 per quintal (qt). If the costs of protecting the fields are avoided, the cut off price can be lowered to ETB 190/qt. Assuming that no other crops can be grown during post-rainy season, any farm-gate prices higher than these minimum prices would be profitable to farmers. This may be relaxed further with the following assumptions that may nullify or reduce the rental value of land: (a) low opportunity cost of land due to poor land quality that makes it unsuitable for other crops during the main rains; (b) limited local land markets if no other crops other than chickpeas may be grown using the residual moisture, and (c) growing of chickpeas generates additional non-marketed benefits in terms of higher soil fertility for the next crop. The latter reduces the incentive for growing chickpeas on land rented for just one season and may contribute to thin rental markets. Under these assumptions, the breakeven price may be as low as ETB 150/qt (at the yield level of 6 qt/kert) or as high as ETB 180/qt (at a yield level of 5 qt/kert). However, the assumption of zero or low opportunity costs of land will not be valid if there is a good rental market for land during the season or if the farmer has the opportunity to grow other crops during the main rains but opted to reserve it for growing chickpea using the residual moisture.

Table 3. *Estimated Kabuli chickpea production costs in Ada'a-Liben (2005)*

Activity	ETB/kert	Remarks about costs
Ploughing and planting	$7 \times 35 = 245$	Land prepared 3 times, with the 1st, 2nd and 4th (planting) ploughings requiring two cultivation days per kert. This implies 7 working days with a pair of oxen. The local rental rate for a labourer with a pair of oxen is ETB 30/day. In addition food is provided.
Seed	$32.5 \times 3.31 = 107.6$	The seed price at the co-operatives for Shasho and Arerti is about ETB 331/quintal. The seed rate is 130 kg/ha.
Weeding	$6 \times 10 = 60$	One weeding using 6 person days per kert.
Pesticides	$0.5 \times 60 + 18 = 48$	0.5 litres per kert (ETB 60/litre) and ETB 18 per kert for sprayer. Transport costs for buying pesticide not included.
Harvesting	$8 \times 10 = 80$	Eight person days per kert.
Transporting harvest to threshing point	$4 \times 13 + 5 \times 4 = 72$	Four people with 4 donkeys. The rental rate for a donkey is ETB 5 per day. Lunch costs ETB 3/person.
Threshing and transporting produce	$4 \times 15 + 20 \times 3 + 2 \times 5 = 130$	Two workers for two days and 6 oxen for one day. A pair of oxen costs ETB 20/day in rental markets. Two donkeys for transporting produce.
Bird watching and security	$(15 \times 30) / 3 = 150$	One hired labour shared among three owners for 30 days.
Total costs	892.6	This is about ETB 3570.4/ha. Assuming a yield level of 2.4 t/ha under good management, this comes down to a production cost of ETB 148.76 per quintal.

The farmers also pointed to a disease that affects chickpeas after the flowering or pod setting stage. Farmers claim that losses are as high as 20% as plants wilt and dry out before filling the pods. The most common disease in Ethiopia with this type of symptom is wilt/root-rot complex and since the released varieties are resistant to the disease, wide scale demonstration would show their superiority and thus enhance their adoption. This is being evaluated through agronomic assessments and field demonstrations with the team from DZARC and the *Woreda* Office for Agricultural and Rural Development.

4 Structure of the marketing system

Chickpea marketing system in Ethiopia is highly underdeveloped and poorly organized. The domestic market accounts for over 80% of the total chickpea volume traded annually. The export market outlet is relatively new and highly variable depending on production conditions in the major importing countries in South Asia and competitiveness with other major exporters. For the moment, the growing demand in domestic markets and low incentives for exporters resulting from low volume, poor quality and poor price competitiveness in export markets seem to favour domestic markets. As Kabuli production is still at its infancy, most of what is traded in domestic as well as export markets so far has been the Desi type chickpea. As is shown in Section 5, the opportunities for exports are likely to improve as large-seeded Kabuli type high-yielding varieties are widely adopted by farmers and the marketed surplus of these market-preferred grains increases significantly.

The grain surplus from the major producing *woredas* reaches the final consumer or end-user through complex channels and long supply chains involving various actors. The supply chains for the domestic markets reach the final consumer in rural areas through rural retailers and farmers and in urban areas through urban retailers and supermarkets. In the export sector, the small volume is exported by several grain traders (who may often engage in both domestic wholesale and retail markets). Using the initial results from the market survey linking Ada'a-Liben *woreda* with secondary and tertiary markets, the major supply chains and marketing channels for chickpea are depicted in Figure 1. The major actors in the primary, secondary and tertiary markets and the major marketing channels and the associated supply chains are described below.⁵

4.1 Primary markets

Most smallholder farmers sell their produce in rural spot markets that convene once a week. Grain traders and rural consumers gather in these markets to procure grain as farmers bring them in small quantities, usually in donkey loads. While the prices may slightly vary among buyers, a weighing scale is commonly used in determining the actual value of the grain. Farmers often complain that the traders deceive them with defective and non-standardized scales. In Ada'a-Liben district these markets include:

- Godino—Monday market
- Tulu Dimtu—Friday market

5. The largely qualitative analyses provided here will need to be supported by a detailed quantitative analyses of the survey data for better understanding of the performance of chickpea marketing channels and value chains in domestic and export markets.

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

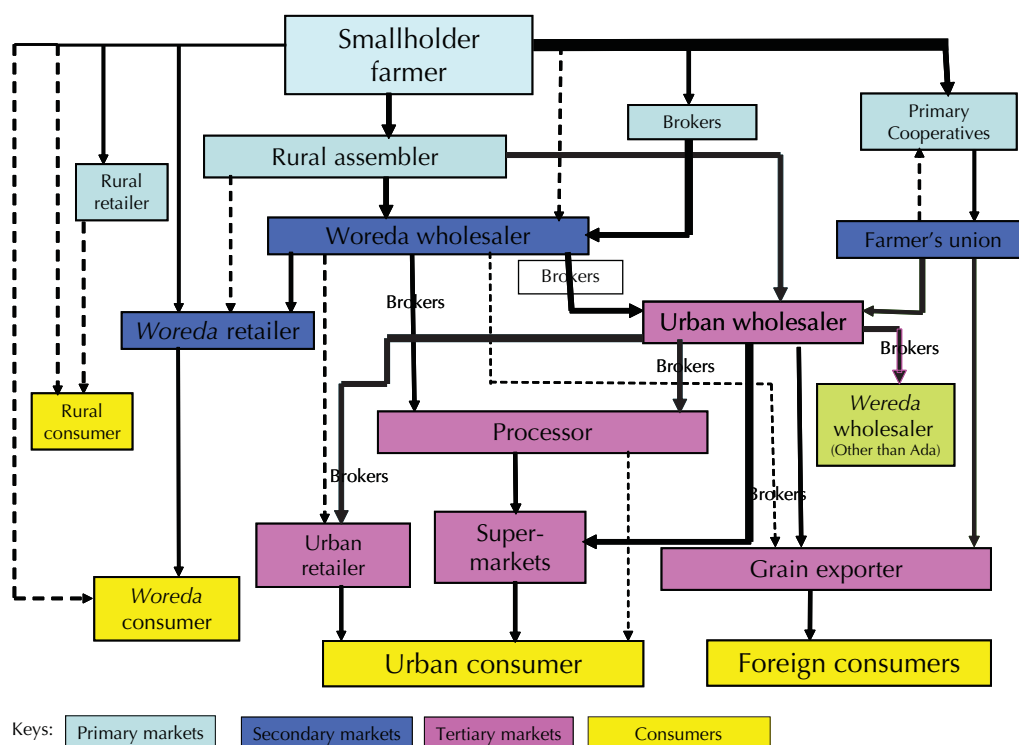


Figure 1. The stylized chickpea marketing channels and supply chains in Ethiopia.

In the primary markets, farmers have the option of selling the grain to several buyers: rural assemblers, brokers (middlemen), *woreda* wholesalers and retailers, and rural consumers. The middlemen include agents of larger wholesalers in secondary and tertiary markets who would operate on a commission basis according to the volume procured. Farmers may also sell smaller quantities directly to rural consumers (including farmer net-buyers), rural retailers running small shops or retailing in the open-air markets in rural areas. The rural assemblers and brokers are the major buyers of chickpeas in primary markets. Depending on the transport costs, expected price incentives and proximity to *woreda* markets, farmers may also bring the grain to *woreda* markets and sell directly to *woreda* wholesalers, retailers or consumers.

The primary markets in Ada'a-Liben are characterized by large number of buyers and sellers and the farmer has the choice of selling to several buyers while the agents of the

larger wholesalers often try to establish informal relationships to encourage the farmers to use their agents. The primary markets however operate only once a week and farmers wanting to sell their grain urgently may have to travel long distances to use any of the other markets. Despite the poor road networks (largely impassable for trucks during the wet season), the primary markets are well integrated with secondary markets in Debre Zeit town and tertiary markets (in Nazareth and Addis Ababa). Controlling for grain quality and season, the prices often increase as the grain moves from the rural spot markets to *woreda* retailers and wholesalers. The recent prices are higher for Kabuli chickpeas compared to Desi types for up to ETB 100/qt even in the primary markets. This represents a significant departure from conditions in 2004 and 2005 when the prices were almost similar. The actual premiums for varietal differences and quality parameters in these markets are not well known and the available data are being analysed to establish these relationships. The price incentives to farmers for supply of quality grains will have a significant effect on incentives for technology uptake, cleaning, grading and sorting of their grain to meet the requirements for alternative end-users at the upper end of the value chain. Lack of such incentives for farmers would inflate the marketing and transaction costs for buyers along the supply chain (for monitoring, cleaning, sorting, grading etc.) thereby increasing the consumer prices and lowering the competitiveness of exports.

In the last few years, the farmers have also had the option of selling Kabuli chickpea through several primary co-operatives of the Erer Farmers' Union (EFU) located in the rural areas. There are about 20 primary co-operatives buying from farmers. These co-operatives often procure *tef* and other crops as well but buy only Kabuli type chickpeas at prices centrally determined by EFU. The grain is then transported to the central warehouse within the premises of EFU in Debre Zeit town for cleaning, grading, packaging and labelling for sale as grain or seed (sold back to farmers through the co-operatives).

4.2 Secondary markets

The secondary markets in the case of Ada'a-Liben include several actors: *woreda* level wholesalers, retailers, consumers, processors and the Erer Farmers Union (EFU). The important channels in this case are the links between assemblers and wholesalers and the brokers and wholesalers. The wholesalers mainly use their own agents to procure the grain in rural primary markets or buy from assemblers who bring chickpeas in varying volumes depending on the amount procured. The wholesalers also buy from some farmers who directly transport the grain to the *woreda* markets. These traders, located in the centre of Debre Zeit town, are more established and trade many other crops (*tef* being

the main commodity). While all have mobile phones and trading premises, some also own warehouses and trucks. Most often the business is run using family labour and hiring is limited to payment (in the form of commission) of agents and workers for cleaning, mixing, grading, loading and off-loading the grain.

While Desi chickpeas still remain the most important, the *woreda* wholesalers have recently started procuring Kabuli chickpeas for supplying exporters based in tertiary markets (Nazareth and Addis Ababa). The major competitor for *woreda* level wholesalers is the EFU which also buys Kabuli chickpeas through its network of primary co-operatives. Both EFU and *woreda* wholesalers in Debre Zeit also procure chickpeas from other adjoining districts (Akaki and Gimbichu). The EFU has higher targets in terms of increasing its market share and becoming a major supplier of Kabuli chickpeas to exporters and larger wholesalers in tertiary markets. The price of chickpeas at this level depends on the competition with EFU and the delivery orders requested by actors in tertiary markets. So far, the major concern of EFU has been meeting the Kabuli seed demand for farmers and has only marginally entered the chickpea grain markets. For example, during the 2004–05 cropping season, the EFU procured 32.3 t of Kabuli chickpeas and distributed about 3 t of Kabuli seeds to farmers through the primary co-operatives. The balance was sold to an exporter at the price of ETB 320/qt. In the following season 2005–06, the EFU procured much less Kabuli chickpeas for seed partly because of the high prices that prevailed during this season and the increased competition from private traders and wholesalers. The peak period prices for Kabuli in the *woreda* market reached ETB 400/qt while the Desi chickpeas traded around ETB 230/qt. As Kabuli chickpeas become known in the market, there is going to be increased competition from larger and well-connected exporters and wholesalers, including one of the largest Kabuli chickpea exporters (Al-Entisar: Abdella and Saggy) located in Dukem town at the heart of the chickpea growing region.

4.3 Tertiary markets

The actors in the tertiary markets include urban wholesalers, exporters, processors, small retailers and supermarkets. Most of the wholesalers in Debre Zeit town sell their Kabuli to exporters and wholesalers based in Nazareth and Addis Ababa. The Desi chickpeas, however, are sold to the large domestic market in the southern part of the country (Awassa, Shashemene, Dilla, Yirgalem, Hageremariam, Chiko and Negelle). The wholesalers in Debre Zeit consider the southern market for Desi chickpeas and the Nazareth and Akaki area markets for Kabuli chickpeas as the most important supply channels. The wholesalers in Addis Ababa also realize the shift in the Kabuli marketing chain increasingly towards the Nazareth market where several exporters are based. This

is important as three districts of Eastern Shewa (Akaki, Ada'a-Liben and Gimbichu) so far remain the main producers of Kabuli chickpeas in the country. The relative proximity to Djibouti and the strategic location of Nazareth seems to have encouraged several exporters to establish their businesses in this town.

Urban wholesalers: This group represents a major gateway to exporters and urban retailers. Except the parastatal Ethiopian Grain Trade Enterprise (EGTE), most of the wholesalers in the Addis Ababa market are mainly based in the area traditionally known as Ehil Berenda and use a network of brokers to buy and sell their grain. In some cases, the wholesalers receive Desi chickpea shipments from the provinces as far as Gondar, Gojjam and Dessie. In other cases, they use a network of brokers and middlemen to buy the grain that arrives in the Addis Ababa market from wholesalers around the country. While most wholesalers know the origin of the chickpea they buy, they rarely keep any records that show such detail and often find it difficult to estimate the amount of grain reaching them from different locations. This means that one cannot determine accurately the quantity of chickpea from Ada'a-Liben or any other district that reaches the wholesale market in Addis Ababa. This requires a complete survey of wholesalers from a given district to determine the flows reaching various markets along the supply chain.

Nevertheless, the market seems to classify the quality grades for the Desi chickpeas based on its origin. Preliminary information from the wholesalers in Addis Ababa indicates that Gondar chickpea is the first quality having yellowish red colour and large size. The next quality grade seems to be associated with chickpea originating from Gojjam, Ada'a area, and Minjar. The lowest quality is associated with the chickpea from Betcho and Olonkomi areas due to its mixed colour and small size. The wholesalers use their agents to sell the grain to retailers, supermarkets, processors and exporters mainly based in Addis Ababa. They also sell to wholesalers outside of Addis Ababa that will further distribute the grain to all deficit areas across the country. For Kabuli chickpeas the quality grades are largely determined based on observation and subjective scales, they include size, colour, foreign matter and insect damage. It should be noted that only a handful of wholesalers in Addis Ababa had a chance to trade Kabuli chickpeas, mainly due to the limited supply and the shift in the Kabuli movement towards Nazareth.

Exporters: Most of the chickpea exporters have buying points both in Nazareth and Addis Ababa. Several exporters have organized themselves into Ethiopian Pulses, Oilseeds and Spices Processors and Exporters Association (EPOSPEA), which has a membership of over 20 companies.⁶ The group has established a good website and is making efforts to promote availability of market information and export opportunities for pulses, oilseeds

6. This seems to have increased recently to over 30 members. Details about the membership and activities of EPOSPEA can be found at their official website: www.epospea.com.

and spices. About half of the members of EPOSPEA are actively engaged in chickpea exports. For Kabuli chickpeas, the largest share of the grain from Ada'a-Liben seems to flow towards Mojo, Nazareth and Akaki. The Desi from Ada'a-Liben areas also seems to follow the same pattern, but also spreads to domestic markets in the southern region. All exporters buy Desi chickpeas but only few of them have traded Kabuli varieties. The exporter based in Akaki areas (outside of Dukem) Al-Entisar (Abdella and Saggy) bought the largest amount. The exporters are well organized and most of them have access to modern communication facilities. They also have good personalized connections with trusted suppliers (*woreda* and urban wholesalers). The chickpea is often exported through FOB prices (and rarely CIF) to several destinations, including India, Pakistan, Saudi, Turkey and USA. Despite the well-organized nature of this market, many of the exporters also do not seem to maintain good records about marketing and transaction costs involved in exporting chickpeas. They also lack information about the expected production levels and potential variability of chickpea supplies in the country, clearly indicating the need for concerned agencies in Ethiopia to make such information timely available to the business community. The lack of this information makes it very difficult for the exporters to tap market opportunities by entering into future contracts and hence forcing them to delay contractual commitments until the grain reaches their warehouses. This leads to significant economic loss and inefficiency that undermines the contribution of the chickpea economy and viability and competitiveness of Ethiopian exports. Perhaps in recognition of such risks, several exporters possess multiple licenses allowing them to diversify trading into wholesaling as well as retailing and processing activities in domestic markets.

Processors: There are two major types of processors of chickpeas in Ethiopia: large industrial food processing companies and small-scale enterprises processing traditional chickpea based consumer products. The first category includes processors like Fafa, Health Food, Green Star and East Africa who produce various value-added products using chickpeas. This group is well-organized and may have several outlets for their products. The larger processors have so far used only Desi type chickpeas mainly because of lower prices and availability of consistent supplies of sufficient quantities. This may change if availability of Kabuli chickpeas increases especially for processors targeting the high value markets within the country and abroad. They buy large amounts of chickpea from wholesalers and brokers mainly from the Addis Ababa and Debre Zeit markets.

The second category of small-scale food processors includes Selam Baltina, Hilina Food Processing and others, traditionally known as Baltinas. They are located in Addis Ababa, Nazareth and many smaller towns across the country and largely target local markets. This group buys small volumes of chickpeas mainly from wholesalers in the nearest markets. These processors prefer the high quality Desi chickpea (e.g. Gondar type) and

prepare various traditional products used in the preparation of vegetarian meals. Their products include various spiced and un-spiced products like Mitin Shiro, Shinbra Asa and Kolo. Most of these processors have local outlets (selling points), but some have grown up significantly (e.g. Selam Baltina which has 16 outlets outside of Addis Ababa). There is a good potential that these processors can grow in number and size, but the demand for their products suffers from stiff competition from other pulses (e.g. field peas, beans etc.). Due to high prices, the small processors are also generally reluctant to use Kabuli types for processing traditional products. Given that relative prices are higher for Kabuli chickpeas, the processors catering to local markets are less likely to use Kabuli unless the value of the processed product also increases. The latter is likely if the small processors target Kabuli products to high-value urban markets (e.g. hotels and supermarkets) while they may continue to cater the Desi types to their traditional buyers. The survey also showed that small processors are also reluctant to provide any information on processing costs, volume of production and selling prices. More information and education is needed to modernize this sector.

The large processors sell their products to the World Food Programme (WFP), World Vision, domestic wholesalers and distributors. Some are even exporting their products to other countries (e.g. canned foods from Green Star). The *baltinas* sell their products to several mini-markets, supermarkets and urban retailers. They also have their own outlets in some areas where the demand for their products is considered to be good. The demand for the products of the *baltinas* increases significantly during fasting seasons when only vegetarian diets are consumed.

Retailers and supermarkets: One of the last groups in the value chain for chickpeas is the retailers and supermarkets that sell the processed and unprocessed products to final consumers. The urban retailers collect chickpeas from wholesalers mainly in urban areas. Brokers of the wholesalers play an important function in linking buyers with the suppliers. The urban small retailers include the kiosks trading chickpeas and outlet shops for the small-scale processors and open air markets where chickpeas are retailed in small quantities. The supermarkets receive mainly packed and labelled products (processed and unprocessed) from processors and urban wholesalers. Supermarkets are generally at early stages of their development in Ethiopia. Except a few large 'supermarkets', many of them have single outlets mainly in Addis Ababa. The total volume of chickpea and chickpea-based products passing through the supermarket channels is currently limited. However, the supermarkets are already importing Kabuli chickpea packages from Greece, Turkey and Syria and there is a good potential to expand the use of Ethiopian Kabuli chickpeas for this high-value sector of the chickpea marketing chain.

5 Market opportunities and competitiveness

Consultations with a number of stakeholders and traders in the country have shown lack of an efficient and effective chickpea marketing system that is responsive to domestic and international market signals. The structure and functioning of the chickpea marketing system is constrained by several factors. First, the supply originates in small quantities from several highly dispersed small producers that supply non-homogenous Desi types to local markets. Given the low productivity of the crop at present, the marketed surplus by individual farmers and the overall traded volume are low, and hence per unit transaction costs of marketing for individual farmers and rural traders are high. Second, there is lack of a well-coordinated supply chain that links producers and buyers. The produce is channelled through complex channel of marketing chains that involve a number of intermediaries and marketing agents (Gabre-Madhin 2001; MoARD 2005). This increases the transaction costs and lowers the share of the consumer price that is received by the small producer.⁷

The high transaction costs underpin the imperfections in grain markets and contribute to the limited participation of smallholders in existing markets. Third, there is no efficient mechanism for delivering market information to the producers and traders at local markets on issues related to seasonal prices, demand, and quality requirements in different markets across the country. This makes prices to be determined mainly through local supply and demand patterns. This aggravates the seasonal price fluctuations in local markets. Fourth, there is lack of a well-established system of grades and standards in the chickpea marketing system. This is despite the three grades recognized by the Ethiopian Grades and Standards Authority (Table 4) and additional quality specifications and certification systems required for export markets (Table 5). Fifth, the Desi chickpea varieties currently grown by farmers in the country are not able to satisfy the quality attributes required by diverse markets. This is in contrast to the Ada'a-Liben *woreda* farmers who are increasingly moving towards the Kabuli types that fetch higher prices in international markets.

7. The literature distinguishes between the physical paid out costs (marketing costs) and the more indirect expenses incurred for concluding transactions (transaction costs) that would include such costs related to obtaining and processing market information, negotiating contracts, monitoring agents and enforcing contracts (e.g. Gabre-Madhin 2001 and references therein). To the extent that these implicit costs of marketing are recognized, many authors now use the two terms interchangeably. We use the term transaction costs in a broader sense to include all marketing costs.

Table 4. *Ethiopian grades and standards for chickpeas*

Quality traits	Maximum allowable limit (%)		
	Grade 1	Grade 2	Grade 3
Totally damaged seeds	0.3–1.0	1.0–1.5	1.5–2.0
Broken grains	0.5	1.0	1.5
Wrinkled grains	2.0	4.0	8.0
Cracked coat	3.0	5.0	7.0
Foreign matter	0.2	0.3	0.5

Source: Quality and Standards Authority of Ethiopia (QSAE).

Table 5. *Additional preferred chickpea traits and requirements in export markets*

Quality traits	Required standard	Remarks
Colour	Cream white	Kabuli's satisfy this requirement
Weight (100 seeds)	> 34 g	Markets also require size in mm
Pesticide residue (max mg/kg)	0.05–2	Depends on pesticide used
Moisture content (%)	< 14	Sufficient drying needed
Weeds, pests, and disease	Free	Phytosanitary certificate needed

Source: Quality and Standards Authority of Ethiopia (QSAE).

5.1 Opportunities for export

Much of the country's production is used in domestic markets and the share of produce that is exported has shown an increasing trend only in recent years (Table 1). Probably, this increase was motivated by exogenous factors such as adverse growing conditions in South Asia and Australia or other factors that increase local demand in South Asian markets. As Kabuli types are not yet well known in the country, the Ethiopian domestic markets and exports are dominated by the small-seeded and golden-to-brown coloured Desi types. There are a number of countries exporting Desi and Kabuli type chickpeas and Ethiopia's current share in the global markets is very limited. The two years (2001–2002) average share for Ethiopian exports was about 2% (Table 6, Annex 2). There is also wide variability in the export volume which may be perceived as unreliable supplies or lack of firm market shares in the global chickpea trade. Until 2001, the limited export of Desi chickpeas was often sold to a couple of countries, mainly Yemen, Djibouti and Israel. As the export volume increased, this was further diversified since 2001 to include South Asia (India, Pakistan and Bangladesh), Middle East and North Africa (UAE, Israel, Saudi Arabia, Morocco, Egypt etc.), North America (USA, Canada), Europe (UK and Greece), Southeast Asia (Singapore, China, Japan, Indonesia), and Latin America (Panama) (Table 6). Given the limited experience in exporting chickpeas, this diversification of markets is a welcome development that may have contributed to recognition of Ethiopia's role as a chickpea exporting country from sub-Saharan Africa. It would be useful to maintain this wider global market presence as the country aims to expand its export of both Kabuli and Desi chickpeas.

Table 6. *Chickpea exports from Ethiopia (2001 and 2002)*

Country	Quantity (t)		Calculated FOB prices (USD/t)	
	2001	2002	2001	2002
Pakistan	2620.87	35,746.00	282.87	300.76
India	19,837.87	3463.64	283.87	277.41
Panama	0.00	2693.99	0.00	351.87
United Arab Emirates	3113.93	3154.20	337.02	291.09
Bangladesh	1200.00	1250.00	270.05	270.12
Singapore	757.56	600.00	266.83	267.84
Israel	169.65	285.19	414.90	375.09
Djibouti	75.36	282.61	325.98	346.09
Saudi Arabia	559.50	332.70	283.25	281.49
Morocco	0.00	198.43	0.00	319.14
Indonesia	99.76	199.56	265.64	273.83
Egypt	0.00	110.00	0.00	316.79
Japan	0.00	104.79	0.00	309.37
China	0.00	104.79	0.00	277.23
Canada	918.72	105.00	290.46	267.13
Germany	0.00	62.87	0.00	362.86
USA	204.50	30.83	322.95	207.32
Yemen	578.95	23.01	290.71	271.51
UK	0.00	5.00	0.00	301.53
Greece	0.00	0.68	0.00	275.28
Switzerland	998.20	0.00	286.13	0.00
Algeria	400.00	0.00	270.42	0.00
Iceland	47.74	0.00	300.64	0.00
Total/average	31,582.61	48,753.29	299.45	297.19

FOB prices are calculated from the total value of exports.

Source: Data provided by Ethiopian Export Promotion Agency as compiled from various sources.

However, while the Indian market seems to prefer Desi types and is relatively less sensitive to quality, there is strong competition among various exporting countries (mainly Mexico, Canada, Syria, Iran and Spain) for Kabuli type chickpeas (Annex 2). Although global trade statistics does not differentiate imports and exports by the type of commodity traded, the worldwide volume of exports and imports and calculated export and import prices are given in Annexes 2 and 3. The quality requirements and standards for export markets are very stringent and need to be complied fully if Ethiopian farmers are going to benefit from and remain competitive in such markets (Tables 4 and 5). For example, the premium quality grades need to have less than 1% damaged seeds, broken grains, or foreign matter or less than 2–3% wrinkled grains or cracked coats. Exporters and other agents along the export supply channel need to realize that these standards and requirements are significantly higher than what is expected in the local markets, and need to be complied by all market participants, including the producers. In addition to quality standards on grain size, colour, pest attack, foreign matter, pesticide

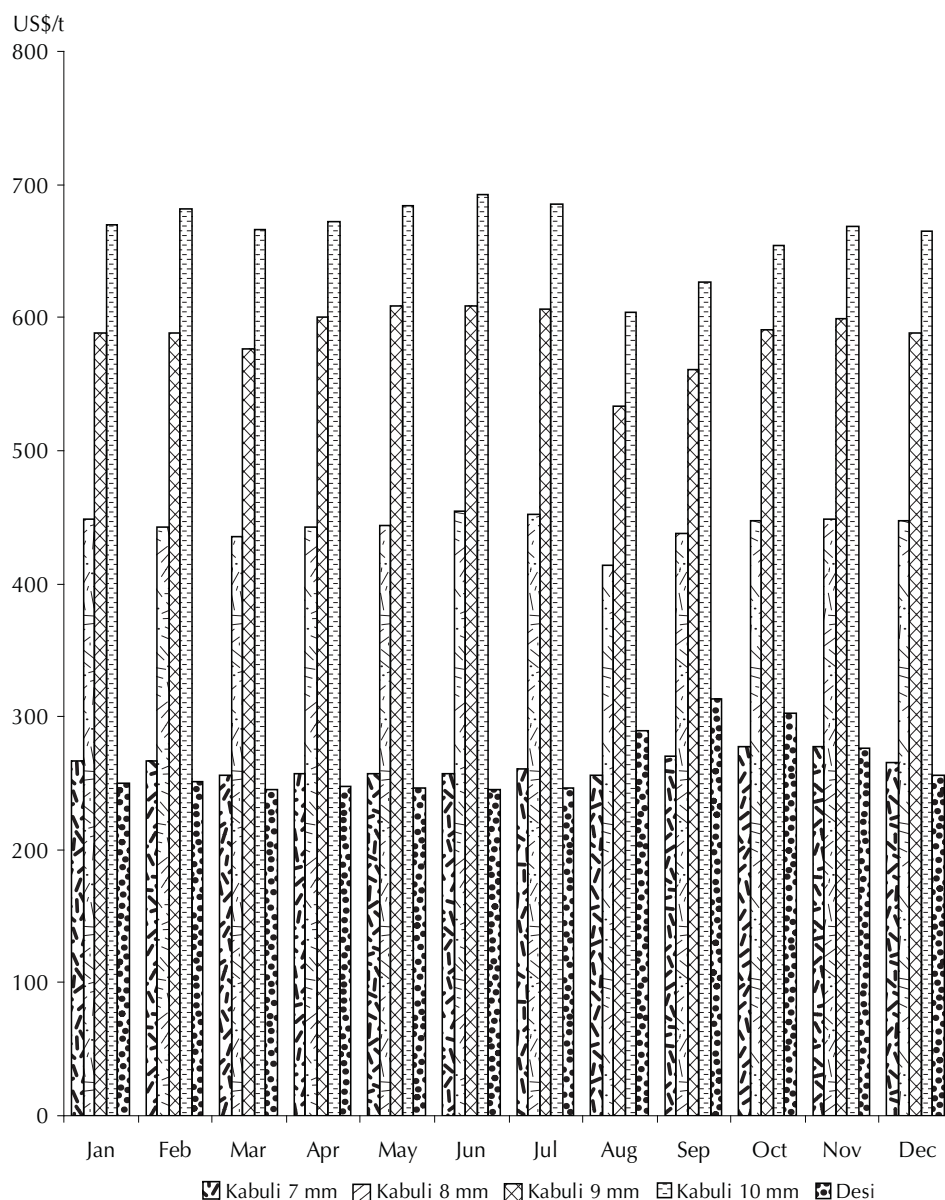
contamination etc., the exporters need to meet phytosanitary requirements (Table 5). In many cases, the product has to be free from any pests or diseases and satisfy very strict food safety requirements in terms of chemical and pesticide residues. The product also needs to be packed in a certain agreeable size (determined by importer requirements) using acceptable materials and properly labelled (showing name of the product, weight, grain size, origin and address of the exporter). Needless to say that packaging and labelling will involve additional costs which will need to be offset by the additional benefits. The exporter needs to undertake a cost–benefit analysis to weigh the gains in targeting the export or domestic markets, especially in situations where the domestic prices are high and demand is increasing.

If producers are unable to deliver consistent supplies of large-seeded Kabuli types, exporters and local processors will lack the incentive to promote the Ethiopian crop which has yet to establish a reputation in international markets. Producers also need to avoid use of certain pesticides that are not approved by FAO and the World Health Organization (WHO). MoARD (2003) provides a list of accepted pesticides for use. Producers also need to improve on threshing practices which are normally done by threshing with draught animals. As export opportunities and competitiveness improves, it is important to develop alternative threshing and processing methods that would reduce organic and other contamination of the grain.

Kabuli varieties generally fetch higher prices than the Desi types in international markets and larger-seeded varieties fetch a higher premium (Figure 2). The world market price for Kabuli chickpeas is generally determined by quality parameters that include grain colour and size as well as other factors that affect quality (e.g. pest attack, foreign matter etc.). The three year average CIF price (2003–2005) for 7 mm Kabuli chickpeas in Canadian markets was USD 264/t. The average price for Desi types was the same. However, the price for 8 mm averages USD 442.7/t, while that for 9 mm was USD 587.3/t. The prices tend to increase in years of poor global production and fall in years of bumper harvests. The 2004–05 prices are generally lower than the 3-year average for Desi and 7 mm Kabuli chickpeas, but higher for the other grain sizes, indicating the growing market preference for the large-seeded Kabuli.

It is important to consider these global price structures in determining whether it would be profitable to export and whether a given country would be competitive in such markets. Smallholder farmers in Ada'a-Liben generally lack information about global commodity markets and they have unrealistic expectations on the price of Kabuli chickpeas, expectations fuelled by the high prices paid to seed producing farmers. These high prices were introduced to ensure that the limited amounts of Kabuli seed distributed

to farmers would be available for purchase so as to rapidly increase seed stocks. In the 2006 season, the grain prices also increased significantly which create incentives for farmers to invest in the new Kabuli seeds.



Source: STAT Communications Agricultural Commodity Trends <http://www.statpub.com/>.

Figure 2. Seasonal chickpea prices by size and type (average, 2003–05, Canadian markets).

What should farmers realistically expect to earn from Kabuli chickpea production? This has to be determined by the export parity prices for Kabuli that should account for all marketing costs involved in cleaning, grading, packing, custom clearing and in-land

transport and sea freight of the commodity to the international destination market. The two released Kabuli chickpea varieties, Shasho and Arerti, that are being promoted by EFU are relatively small-seeded (compared to those from competing countries like Turkey, Greece, Canada, Spain and Mexico) and are unlikely to attract prices more than USD 450/t. The two newly released Kabuli varieties (Ejeri and Teji) with slightly larger seeds may have a better potential but it has not yet been established if these will attract a market-premium over the first two released varieties.

Until quality standards improve and export of Kabuli chickpeas from Ethiopia earns the required market reputation, a CIF price of USD 400/t seems to be reasonable. From this price Ethiopian exporters have to deduct the cost of transport, insurance and freight. Preliminary data collected through discussions with exporters indicate that transport and other export processing charges (customs clearance, freight handling, port charges etc.) from Debre Zeit to the seaport of Djibouti costs ETB 43/qt in 2004, which is equivalent to USD 50/t. Finally shipping charges from Djibouti to the port of delivery have to be paid and these vary on a number of factors including the volume of cargo and frequency of service, but USD 40/t seems a reasonable estimate for shipping.

After domestic transport, export processing, freight and other costs totalling USD 90/t have been deducted, EFU needs to cover the cost of transport from the primary co-operatives to Debre Zeit where the crop needs to be cleaned, bagged, packed into containers and fumigated ready for export. By providing these quality-enhancing (value-adding) services the Union can establish credibility as a reputable business organization with which exporters will want to do business. No formal costing of these steps has been undertaken but USD 20/t would not be unreasonable. Assuming a 5% margin for the Union,⁸ the cumulative deductible from the CIF price of USD 400/t for 8 mm chickpeas amounts to USD 130/t. This provides an export parity farm-gate price to the farmer of about USD 270/t (or ETB 233/qt). Table 7 summarizes the breakdown of all the transaction costs associated with export of chickpeas from Ada'a-Liben *woreda*.

Having established an indicative price that an Ethiopian farmer could expect, we need to determine whether Kabuli exports would be attractive to the smallholder farmer and the farmers union. Chickpea production costs estimated above amounted to about ETB 3570/ha. If one assumes a positive opportunity cost for land allocated to chickpeas (which presupposes that the farmer can either grow other crops or rent it out to other farmers during the season), the rental value of land needs to be included in the production costs to assess whether the chickpea enterprise would be competitive. In other words, for

8. Strictly speaking this is not a margin; it is intended to cover the more implicit and indirect costs (transaction costs) related to obtaining and processing market information and negotiating and concluding contracts with foreign buyers.

chickpea production to be attractive to the farmer, the returns should be higher than the rental value of land (i.e. about ETB 1600/ha). As estimated earlier, based on the estimated yield of 2.4 t/ha (600 kg/kert) and the estimated costs, the price that would make chickpea production attractive to the farmer would need to be higher than ETB 215/qt. This means that the export parity price of ETB 230/qt estimated above is likely to be attractive to farmers to continue production of Kabuli chickpeas. The minimum price of ETB 215/qt that would make the farmer indifferent between renting out the land or growing Kabuli chickpeas is equivalent to a farm-gate price of USD 250/t. As discussed earlier, the breakeven price can be much lower if one assumes that no other crops can be grown on such land at the end of the season. This would enhance the competitiveness of Ethiopian farmers. This needs to be established based on the perceptions of farmers and the performance of local land rental markets in the areas during the chickpea growing season.

Table 7. Breakdown of estimated transaction costs for exporting Kabuli chickpeas

	USD/t	USD/qt	ETB/qt ^a
World market price	400	40	345
Transport, Djibouti to Mumbai	40	4	34
Transport, Debre Zeit to Djibouti (FOB) and clearing costs	50	5	43
Assembly, cleaning, bagging and fumigation in Debre Zeit	20	2	17
Total expenses	110	11	95
Margin to Union (5%)	20	2	17
Price to farmer	270	27	233

a. In 2006, exchange rate of USD 1 = ETB 8.6.

In addition to production costs, the profitability of Kabuli chickpea production would of course depend on several factors, including (a) the yield levels, (b) transaction costs, and (c) the world market prices. The effect of these factors on smallholder competitiveness and profitability of Kabuli production is demonstrated in Figures 3–6. These results depict how the farm-level profitability of Kabuli production would vary when the yield, transaction costs and international prices change, assuming a positive rental value of land (ETB 1600/ha). Generally, farm profits and farm-gate prices increase as transaction costs fall. Assuming a positive opportunity cost of land and with the estimated transaction cost of USD 130/t (about ETB 1200/t), we can see that when the international price (P_w) equals USD 400/t, Kabuli production will not be profitable at a farm-gate price of ETB 230/qt unless the yield levels are higher than 2.4 t/ha (600 kg/kert) (Figure 3).⁹

9. This would significantly change if one assumes zero opportunity cost or no rental markets for land, in which case even farmers producing about 1.6 t/ha (400 kg/kert) would find it profitable to grow and sell chickpeas at the price of ETB 230/qt.

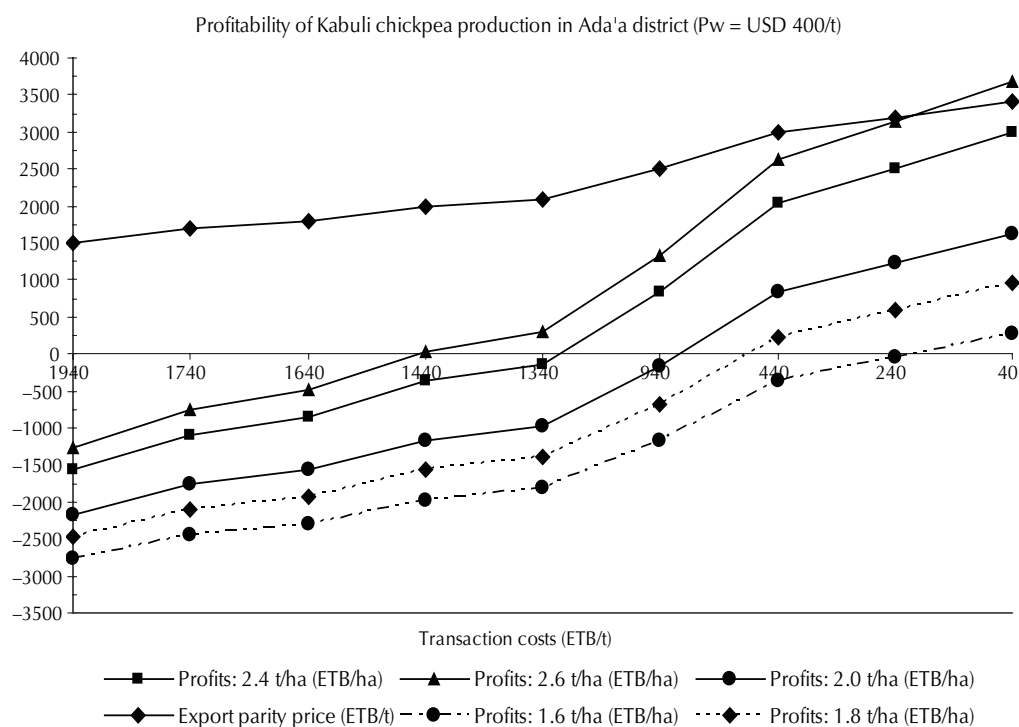


Figure 3. The effect of changes in crop yields and transaction costs on farm-gate prices and profitability of chickpeas (World market price Pw = USD 400/t).

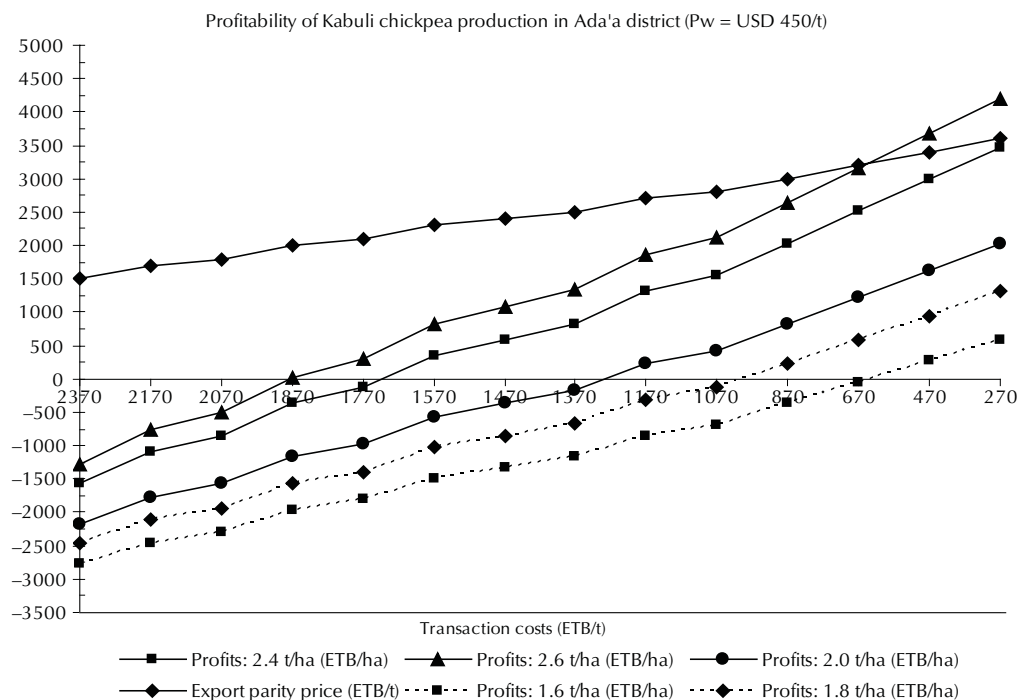


Figure 4. The effect of changes in crop yields and transaction costs on farm-gate prices and profitability of chickpeas (World market price Pw = USD 450/t)

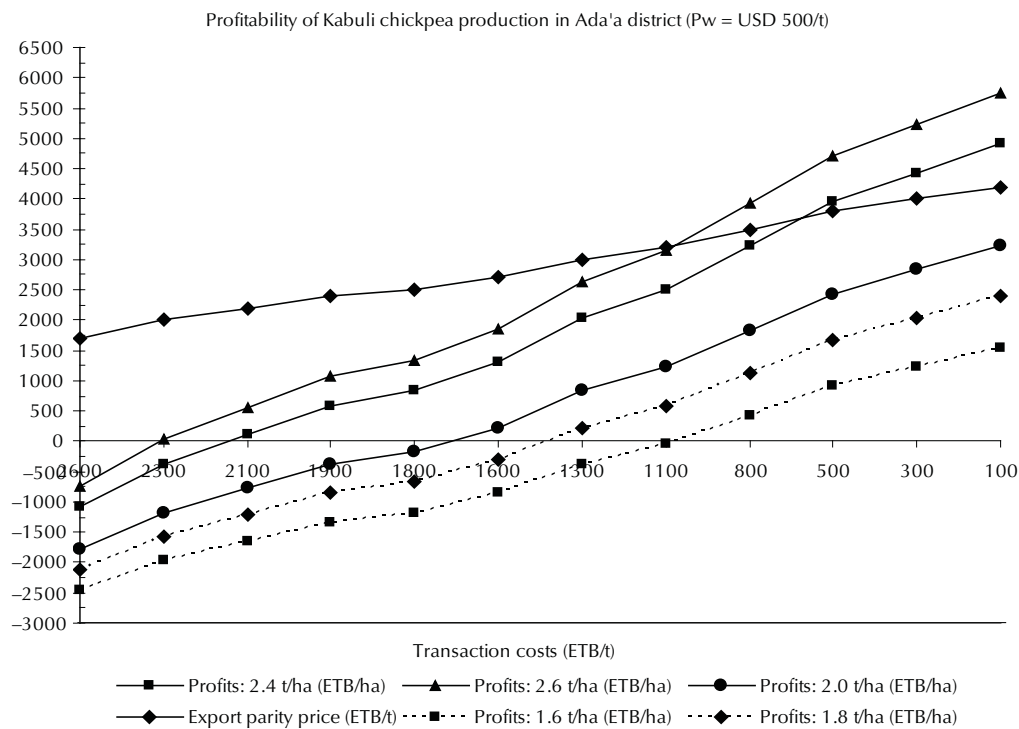


Figure 5. The effect of changes in crop yields and transaction costs on farm-gate prices and profitability of chickpeas (Pw = USD 500/t).

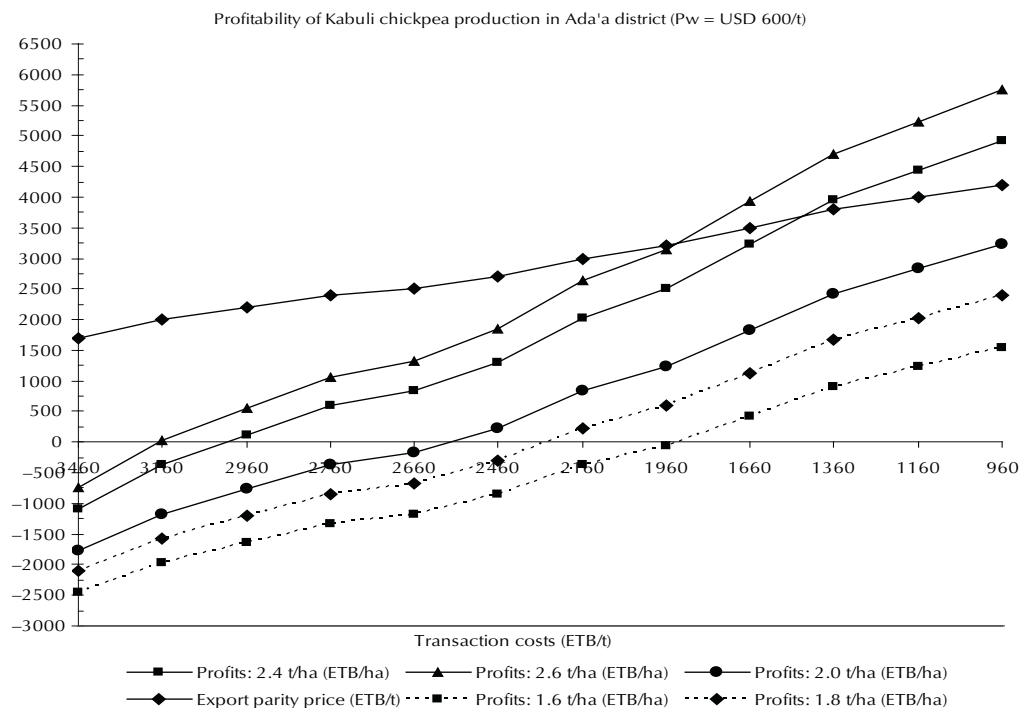


Figure 6. The effect of changes in crop yields and transaction costs on farm-gate prices and profitability of chickpeas (Pw = USD 600/t).

However, an increase in P_w ($P_w = 450$) would make farmers producing about 2 t/ha (500 kg/kert) profitable (with a positive opportunity cost for land) as the farm-gate price increases to about ETB 270/qt (Figure 4). Similar analysis is done for $P_w = 500$ and $P_w = 600$ in Figures 5 and 6, respectively. Obviously, this would increase the competitiveness of Ada'a-Liben smallholder farmers as local export parity prices would increase over ETB 300/qt and make even less efficient farmers producing 1.6 t/ha (400 kg/kert) profitable (Figures 5 and 6). However, these price levels are highly unrealistic for the current varieties grown, and may be plausible in the long term if new large-seeded (> 8 mm) cultivars are introduced.

5.2 Opportunities in domestic markets

As presented earlier, much of the chickpea produced is traded within the domestic markets. Currently the local markets mainly know the Desi types that consumers have been used to for a long time. Because Kabuli types are largely unknown in domestic markets, it is conceivable that Kabuli chickpeas might even fetch lower prices than the traditional Desi types until consumer resistance is overcome. But discussions with traders indicate that domestic consumers are likely to shift relatively easily to Kabuli types if the marketed surplus increases and prices remain competitive with Desi types. This is strengthened by the good taste for Kabuli chickpeas that is in fact causing problems for producers as passers by and other villagers as part of the tradition want to consume more of these tasty chickpeas at green stage. There is also a thriving market for green chickpeas in Debre Zeit town and along the roadsides for selling green chickpeas. There is a potential to develop this market further, including delivery of green shelled or processed (including packing) chickpeas to supermarkets in Addis Ababa and other urban centres.

Discussions with some stakeholders and processing plants have also indicated the potential to expand the domestic market for dry Kabuli chickpeas. Some supermarkets in Addis Ababa have already started stocking imported canned and shelled dry chickpeas (in small packs). The growing high-tech processing industry, including one based in Debre Zeit itself, requires some quantities of Kabuli chickpeas for processing. The establishment of a canning factory in Debre Zeit by Green Star Food Company that requires an estimated 2000 qt/year provides an alternative market opportunity for EFU. This factory would have to pay the world market price to secure good quality Kabuli chickpea for canning, and to import 8 mm Kabuli chickpea would cost the company an import parity price of USD 490/t based on the current world market price plus shipping and other charges (CIF). Procuring chickpea locally will obviously be much more attractive than importing raw materials for the processing factories like Green Star, and it should be possible to negotiate a relatively higher price than the estimated export parity prices

of ETB 230/qt. However, the demand from Green Star for now is small relative to the expected total production of Kabuli by the Union. The best strategy would be to select one or two well-positioned primary co-operatives or those farmers who had experience in seed production to produce good quality Kabuli to meet this local demand.

Given that quality is an important criterion for Green Star and other processing industries targeting high-value and quality-conscious markets, it is suggested that the Union finalize a long-term contract farming arrangement with agreeable forward prices and start supplying to this buyer. It is advisable that such contract is done through the Union but attractive prices should be offered to farmers to ensure good quality grains. The other option would be for the Union to clean the grain and sell it to the processor at a premium price so that all member co-operatives would benefit from the higher prices and proceeds from this local niche market. In the long-term, in order to meet quality requirements in such high-value niche markets (domestic and external); the Union should consider introducing mechanized threshing to avoid grain contamination by animals during threshing.

There are also other small-scale processing and enriched foods producing enterprises that require sizeable quantities of chickpeas. The food processors consulted during the fieldwork (Health Care Food Manufacturers and Helina Enriched Food Processing) suggested an annual demand of 8000–10,000 t. However, these plants produce for domestic markets and are currently using Desi types and less likely to buy Kabuli at a higher price. The Union may need to establish linkages with major processors in the country and explore opportunities for diversifying its market along both Kabuli and Desi types. This requires a clear and simple mechanism for establishing future contracts that will be honoured and respected in good faith by both parties.

5.3 Quality seeds for viable commercialization

Significant investments have been made by research, the Ethiopian Seed Enterprise and EFU in seed production of new Kabuli varieties. As more and more farmers get access to this seed, there is a real risk that farmers will start using own-saved seed, and this will potentially affect the quality of the grain being offered for sale by farmers. For example, there are two new Kabuli varieties (Teji and Ejeri) that have just been released and it will be important for farmers to maintain the varietal identity of the four released Kabuli varieties and not deliver mixed consignments.

It is suggested that farmers who want to be involved in contracted chickpea production for targeted markets are registered and required to regularly purchase fresh seed of the variety that is required by the buyer. During the season, follow-up visits need to be

made to determine the amount of land planted with improved seed, and an estimate of the expected production made which can be used to verify the final amount delivered. Obviously, farmers may have the incentive to plant cheaper seeds and severe sanctions need to be declared before the season and applied when cases of cheating occur.

6 Conclusion

Ethiopia did not benefit from export markets in the past mainly due to the predominance of low value Desi types and high transaction costs that make exports unattractive.

The varieties grown across Ethiopia so far are of the traditional Desi types with small seeds and reddish brown colour. In recent times, the Desi types have been exported to several markets (the largest volume going to South Asia). The white coloured and large seeded Kabuli types are, however, more preferred in European, North American, South African and Middle East markets. The agro-climatic conditions in the Ethiopian highlands are suitable for growing these temperate type chickpeas. The introduction of new large-seeded Kabuli types opens new opportunities for Ethiopian farmers to export these high-valued agricultural products. Harnessing this opportunity and tapping the potential, however, requires technical and institutional interventions that improve the competitiveness of chickpea exports from Ethiopia. One of the interventions required is establishment of a viable and market responsive seed supply and input delivery system that would enhance the availability and use of yield-enhancing technologies by small farmers. Given the fact that the country is landlocked (and hence high transport and freight charges), production costs need to be significantly lower for these exports to be competitive. Improving productivity, lowering direct costs of production and enhancing market linkages (reducing transaction costs) is the key for improving competitiveness of smallholder producers and the country at large.

The chickpea marketing system is generally characterized by low volumes, scattered and fragmented suppliers, complex supply chains, lack of reliable sources of market information, lack of quality control and grading systems, and high transaction costs. In a country that is landlocked and does not have cheaper means of transporting bulky commodities, this undermines the competitiveness of smallholder producers. Along with low yields and limited volume of production that also limit competitiveness, an overwhelming proportion of the national surplus is traded in domestic markets. In an effort to promote market-led agricultural development, Ethiopia has recently formulated an ambitious agricultural and input marketing strategy that aims to address each of these limitations in the marketing system (MoARD 2005). In the long-term, Ethiopia's competitiveness in chickpea exports would critically depend on improving productivity, grain quality and ability to consistently supply required volumes of market-preferred commodities at competitive prices and at the right time.

In Ada'a-Liben *woreda* and the surrounding areas, chickpea is grown mainly for markets and for soil fertility restoration. The crop is planted on deep black soils after mid August and is grown using the residual soil moisture. Along with suitable agro-climatic

conditions, the availability of new Kabuli varieties from Debre Zeit Agricultural Research Center (the national coordinator for chickpea improvement), with desired agronomic and market traits, has placed Ada'a-Liben in a competitive position to further improve productivity and commercialize chickpea production. During the 2005 season, the Erer Farmers' Union has made tremendous effort in multiplying about 5000 qt of the available Kabuli varieties. The challenge is to enter into future market contracts that would provide reliable market outlets and attractive prices to farmers. Without such outlets and profitable prices, farmers are reluctant to buy and plant the new seeds.

Proper pricing of grain and the seed requires better knowledge of farmers' costs of production. The farmers also need to be educated about the differences in the prices of grains and seeds. As the quality standards and costs are different, seed production and pricing needs to be separated from grain production and pricing. Seed production should be focused on fewer and well-trained farmers. In the long term, this should perhaps be handled by a commercial farmer with the required skills and area of land required to reach the desired volumes in a short time. The cost of production and the market price of grains can be the basis for proper pricing of seeds. There is a need to gather proper data on production costs and returns for chickpea and other primary commodities in the *woreda*. Farmers and the Union also need to know more about the international prices for chickpeas and the associated transactions costs. This preliminary assessment has looked into farmers' production costs as well as costs of exporters. The production costs for Kabuli are about 3570/ha (USD 415/ha), indicating a minimum price of ETB 215/qt (USD 250/t) to make Kabuli chickpea production attractive to farmers (compared to renting out land at ETB 400/kert). If such land has no rental value during the post-rainy season or has low opportunity cost, the breakeven price can be lowered up to ETB 150/qt (6 qt/kert yield) or ETB 180/qt (5 qt/kert yield). Under these cost structures, the production of 8 mm Kabuli varieties for export markets seems to be profitable to farmers as the export parity price would be about ETB 233/qt.

Better prices in export markets, would even make the chickpea export value chain more competitive in the country. Higher domestic wholesale prices would, however, make exports less attractive. During 2006, the domestic prices for both Kabuli and Desi types have increased significantly over the previous years. Most of the Kabuli demand so far is targeted for the export markets while the traditional Desi type is mainly traded in the domestic markets. Given the high prices for Kabuli types, and assuming similar production costs, there is a higher economic incentive for farmers to shift from Desi to Kabuli production. Therefore, the changing configuration of prices is likely to affect future land allocation and adoption decisions of chickpea growers. More work is needed to determine the extent to which domestic markets will absorb Kabuli chickpeas and the

optimal strategy for chickpea farmers. Along with improved market linkages that reduce transaction costs for small producers, better information on production conditions and market intelligence (both domestic and export) would play a crucial role in strengthening the chickpea value chain in Ethiopia.

To create enabling and conducive conditions for the uptake of profitable varieties, there is a need to enhance farmer access to inputs (including credit for the poorer households) and output markets and information about complementary chickpea technologies, including seed treatment, phosphorous fertilization, planting techniques, and pest and disease management practices.

The Union also needs to negotiate with all reliable exporters that are offering good prices. Once a contract is signed, the farmers need to be informed about the minimum expected price and encouraged to buy the new Kabuli seeds and grow them. Often these prices are not, however, known at the start of the planting season and traders are very unwilling to commit themselves to a price at that stage, indicating to the need for new and more flexible contracts. Moreover, most traders/exporters are wary of entering into contracts with farmers and/or the co-operatives. Similarly, farmers often consider price offers by traders as suspect and remain reluctant to enter into future contracts with traders. The reasons are related to lack of confidence in their ability to negotiate a business deal and deliver a reliable and good quality product and respect the terms of agreement. Availability of reliable and consistent suppliers is critical for any sustainable business relationship. In this regard, the Union needs to be informed and educated on how to negotiate and enter into viable business agreements that need to be honoured once agreed. It would be useful to bridge the gap of knowledge between the traders/exporters, the farmers and the Union. The traders/exporters would benefit from knowing the available Kabuli varieties, their traits, farmers' production conditions and costs and make market preferences known to farmers and researchers. The farmers would also learn about market potentials, transaction costs and what it takes to establish a brand for a good quality product in international markets. The exporters association (EPOSPEA) is keen to participate in this kind of partnerships.

To enhance farmer awareness and showcase best practices for improving productivity and control pests/diseases, and to help farmers choose suitable Kabuli varieties (including those released in 2005), on-farm demonstrations and agronomic performance (including yield and production cost assessments) need to be completed in each season at least in the first two years. DZARC has agreed to take the lead in planning and initiating these demonstrations in selected sites across the *woreda*. Perhaps this needs to be expanded to all the three *woredas* that constitute the Erer Farmers' Union using more innovative

outreach strategies. More innovative approaches that engage the farmers as well as some market actors are required to introduce farmer and market-preferred cultivars and the complimentary agronomic practices that increase net returns to farmers and enhance the competitiveness of Ethiopian chickpeas.

Policy and institutional interventions need to be designed to improve the efficiency of markets and enhance farm-gate prices to producers. In order to identify such interventions, a supply and value chain analysis for chickpeas is needed to identify the major marketing channels, the actors involved and the associated transaction costs and marketing margins along the supply chain. ICRISAT has already initiated this study together with DZARC and IPMS and the results are expected to shed some light and provide useful policy insights for enhancing commercialization of chickpeas.

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Annex 1. Global trends in chickpea area and production

Region/country	Area (× 10 ³ ha)				Production (× 10 ³ t)			
	2002	2003	2004	Average	2002	2003	2004	Average
Developing countries	9882	9109	10776	9923	7830	6700	8243	7591
<i>Africa</i>	<i>598</i>	<i>559</i>	<i>589</i>	<i>582</i>	<i>414</i>	<i>342</i>	<i>361</i>	<i>372</i>
Ethiopia	195	140	168	168	187	114	136	146
Malawi	88	88	88	88	35	35	35	35
Morocco	72	71	72	72	51	43	42	45
Tanzania	70	70	70	70	30	32	25	29
Algeria	19	20	20	20	15	15	15	15
Sudan	13	13	13	13	30	30	30	30
Tunisia	8	24	25	19	6	15	15	12
Egypt	7	7	7	7	14	12	11	12
Uganda	6	6	6	6	3	3	3	3
Others	60	60	60	60	21	21	24	22
<i>Southeast Asia</i>	<i>197</i>	<i>209</i>	<i>210</i>	<i>205</i>	<i>219</i>	<i>236</i>	<i>240</i>	<i>232</i>
Myanmar	195	207	208	203	212	228	230	223
China	3	2	2	2	7	8	10	8
<i>South Asia</i>	<i>7379</i>	<i>6659</i>	<i>8299</i>	<i>7445</i>	<i>5857</i>	<i>4824</i>	<i>6336</i>	<i>5672</i>
India	6416	5671	7290	6459	5473	4130	5770	5124
Pakistan	934	963	986	961	362	675	548	528
Bangladesh	15	15	14	15	11	11	10	11
Nepal	13	10	10	11	11	8	8	9
<i>West Asia</i>	<i>1554</i>	<i>1526</i>	<i>1521</i>	<i>1534</i>	<i>1098</i>	<i>1052</i>	<i>1060</i>	<i>1070</i>
Iran	750	755	755	753	300	310	310	307
Turkey	660	630	630	640	650	600	650	633
Syria	102	100	95	99	89	87	45	74
Yemen	29	30	30	29	36	36	36	36
Israel	8	8	8	8	17	15	14	15
Lebanon	3	2	2	2	3	2	2	2
Jordan	2	2	2	2	3	2	2	2
<i>Latin America and the Caribbean</i>	<i>154</i>	<i>157</i>	<i>157</i>	<i>156</i>	<i>243</i>	<i>247</i>	<i>246</i>	<i>245</i>
Mexico	147	150	150	149	235	240	240	238
Chile	3	4	4	4	3	3	3	3
Peru	2	2	2	2	3	2	2	3
Argentina	1	1	1	1	1	1	1	1
Developed countries	456	307	245	336	376	325	235	312
Australia	201	152	113	155	136	178	114	143
Canada	154	63	39	85	157	68	51	92
Spain	89	78	80	83	70	65	57	64

Annex 1 (*cont'd.*)

	Area ($\times 10^3$ ha)				Production ($\times 10^3$ t)			
	2002	2003	2004	Average	2002	2003	2004	Average
Italy	5	6	5	5	6	6	6	6
Bulgaria	4	5	3	4	5	6	3	5
Greece	2	2	2	2	2	2	2	2
Portugal	2	3	3	2	1	1	1	1
World	10,338	9417	11,021	10,259	8206	7025	8478	7903

Source: Compiled from FAO (2005). FAO Agricultural Statistical Database (online: www.faostat.org).

Annex 2. Global chickpea exports and prices

Region/country	Exports: Quantity ($\times 10^3$ t)				Calculated FOB price (USD/t)			
	2001	2002	2003	Mean	2001	2002	2003	Mean
Developing countries	509.76	476.03	556.86	514.22	440	415	387	404
<i>Africa</i>	13.31	73.78	42.90	43.33	391	302	318	316
Tanzania, United Republic of	8.99	21.08	27.23	19.10	306	286	287	289
Ethiopia	0.09	48.55	2.33	16.99	553	302	333	304
Morocco	1.78	2.89	12.28	5.65	887	423	379	439
Tunisia	1.39	0.55	0.13	0.69	358	286	227	331
Others	1.07	0.72	0.93	0.91	310	260	408	330
<i>Southeast Asia</i>	2.68	6.95	73.95	27.86	327	289	272	275
Myanmar	0.00	0.00	73.25	24.42	0	0	271	271
China	2.68	6.95	0.70	3.44	327	289	350	303
<i>South Asia</i>	6.18	4.95	11.29	7.47	380	403	329	360
Pakistan	4.75	2.58	8.27	5.20	375	434	304	347
India	1.43	2.23	2.90	2.18	397	372	400	390
Nepal	0.00	0.11	0.00	0.04	0	263	750	280
Sri Lanka	0.00	0.00	0.12	0.04	2000	1667	345	403
Bangladesh	0.00	0.03	0.00	0.01	0	346	3000	444
<i>West Asia</i>	279.75	246.79	285.79	270.77	482	484	469	478
Turkey	153.95	104.67	189.60	149.41	489	460	435	459
Iran, Islamic Republic of	123.52	139.72	87.11	116.78	473	503	547	503
Syrian Arab Republic	0.98	0.36	8.49	3.27	715	900	423	469
Lebanon	1.03	1.65	0.20	0.96	323	320	541	336
Jordan	0.12	0.22	0.39	0.24	566	416	225	339
Israel	0.14	0.17	0.01	0.11	832	799	800	814
<i>Latin America and the Caribbean</i>	207.84	143.56	142.94	164.78	619	597	546	592
Mexico	207.09	142.68	141.38	163.72	619	598	548	592
Argentina	0.31	0.70	1.09	0.70	708	434	351	431
Others	0.75	0.88	1.56	1.06	661	464	426	492
Australia	266.52	94.23	144.07	168.27	305	343	304	312
Canada	149.21	111.57	94.06	118.28	359	353	326	348
Spain	5.70	3.75	4.20	4.55	760	617	713	706
Portugal	2.43	2.69	2.89	2.67	993	1041	1029	1022
Bulgaria	2.08	2.95	2.04	2.35	290	239	292	270
Italy	0.48	0.55	1.42	0.82	597	726	574	613
Greece	0.09	0.08	0.09	0.09	787	813	933	846
World	936.27	691.85	805.63	811.25	440	415	387	404

Source: Compiled from FAO (2005). FAO Agricultural Statistical Database (online: www.faostat.org).

Annex 3. Global chickpea imports and prices

Region/country	Imports: Quantity (×10 ³ t)				Calculated CIF price (USD/t)			
	2001	2002	2003	Mean	2001	2002	2003	Mean
Developing countries	1092.37	819.74	866.00	928.70	476	421	412	439
<i>Africa</i>	112.23	71.72	75.85	86.60	602	488	474	533
Algeria	70.50	34.40	45.93	50.28	717	644	586	660
Tunisia	19.97	18.71	18.87	19.18	221	188	156	189
Egypt	5.91	6.41	4.16	5.49	741	690	657	700
Libyan Arab Jamahiriya	2.46	2.86	4.15	3.15	835	493	459	567
Morocco	6.04	0.20	0.14	2.13	674	797	843	681
Eritrea	2.10	2.10	0.10	1.43	286	286	520	291
South Africa	1.11	1.17	0.99	1.09	510	462	458	477
Others	4.14	5.88	1.51	3.84	534	722	566	639
<i>Southeast Asia</i>	1.28	1.33	1.39	4.00	242	217	221	227
China	1.28	1.33	1.39	4.00	242	217	221	227
<i>South Asia</i>	673.96	477.81	477.34	543.04	370	327	333	347
India	516.82	217.55	259.24	331.20	371	325	336	352
Pakistan	106.12	182.06	123.26	137.15	352	335	337	340
Bangladesh	37.50	56.82	83.90	59.41	373	297	302	316
Sri Lanka	13.39	17.36	10.55	13.76	443	376	452	417
Nepal	0.13	4.00	0.38	1.50	400	330	286	328
Maldives	0.01	0.02	0.01	0.01	1000	941	917	951
<i>West Asia</i>	279.75	246.79	285.79	270.77	482	484	469	478
Turkey	153.95	104.67	189.60	149.41	489	460	435	459
Iran, Islamic Republic of	123.52	139.72	87.11	116.78	473	503	547	503
Syrian Arab Republic	0.98	0.36	8.49	3.27	715	900	423	469
Lebanon	1.03	1.65	0.20	0.96	323	320	541	336
Jordan	0.12	0.22	0.39	0.24	566	416	225	339
Israel	0.14	0.17	0.01	0.11	832	799	800	814
<i>Latin America and the Caribbean</i>	25.15	22.10	25.63	24.29	683	587	562	611
Colombia	10.28	10.14	11.65	10.69	650	530	509	561
Brazil	3.57	3.08	3.19	3.28	703	600	542	619
Venezuela	3.66	1.49	1.83	2.33	619	679	646	639
Trinidad and Tobago	2.26	2.26	2.36	2.29	791	705	687	727
Chile	0.76	1.35	2.42	1.51	697	444	515	524
Guyana	1.17	1.19	0.87	1.08	731	691	826	742
Costa Rica	0.72	0.95	0.69	0.79	654	597	592	613
Cuba	0.99	0.57	0.45	0.67	984	993	751	934
Others	1.74	1.07	2.17	1.66	633	553	563	585
Developed countries	162.72	153.46	140.14	152.10	655	610	633	633
Spain	68.73	58.06	53.95	60.25	705	691	711	703
Italy	22.74	22.33	20.69	21.92	650	580	559	598
UK	15.74	17.91	17.56	17.07	570	521	546	545

Annex 3 (cont'd.)

	Imports: Quantity (×10 ³ t)				Calculated CIF price (USD/t)			
	2002	2003	2004	Mean	2002	2003	2004	Mean
Portugal	12.17	11.86	11.61	11.88	709	636	627	658
France	13.35	11.22	10.99	11.86	635	566	539	583
USA	10.96	11.62	10.41	11.00	674	568	630	623
Canada	9.47	9.93	5.37	8.26	342	326	430	355
Greece	3.06	4.56	4.80	4.14	826	773	743	774
Germany	2.75	2.58	2.84	2.72	763	752	727	747
Belgium	2.36	2.01	1.03	1.80	541	590	869	622
Netherlands	1.39	1.38	0.88	1.22	579	557	610	578
World	1255.09	973.20	1006.13	1080.80	566	515	522	536

Source: Compiled from FAO (2005). FAO Agricultural Statistical Database (online: www.faostat.org).

Annex 4. Institutions visited and people consulted

Dr Tsedeke Abate, Director General, EIAR, Addis Ababa
Dr Solomon Assefa, Center Director, Debre Zeit Agricultural Research Center (DZARC)
Dr Seid Ahmed, Director, Crop Research, EIAR, Addis Ababa
Dr Million Eshete, Chickpea Breeder, DARC, Debre Zeit
Mr Getahun Alemu, General Manager, Ethiopian Seed Enterprise (ESE), Addis Ababa
Mr Getachew Desta, Head, Production Department, ESE, Addis Ababa
Mr Dirk Hoekstra, Project Manager, IPMS, Addis Ababa
Dr Berhanu Gebremedhin, Senior Economist, IPMS, Addis Ababa
Dr Azage Tegegne, Technology Specialist, IPMS, Addis Ababa
Mr Negatu Alemayehu, Research and Development Officer, IPMS, Debre Zeit
Dr Abera Debelo, Country Representative, SG2000-Ethiopia
Mr Sileshi Bogale, Marketing and Agribusiness Officer, VOCA-Ethiopia
Mr Negussie Belayneh, Secretary General, and Yilma K-Mariam, Marketing Expert,
Ethiopian Pulses, Oilseeds and Spices Processors and Exporters Association (EPOSPEA)
Dr Geletu Bejiga, Manager (Agriculture), Green Focus Ethiopia, PLC
Mr Dawit Bekele, General Manager, Green Star Food Company, Debre Zeit
Mr Nega Gebreyesus, Manager, Ropack International, Addis Ababa and South Africa
Mr Amha Woldemichael, Managing Director, Negadras General Trading Co.
Sas Mwine, President, Commerce Africa, LLC, USA
Mr Belete Beyene, General Manager, Health Care Food Manufacturers and Helina
Enriched Food Processing PLC
Mr Kassahun and Mekonnen, CEO and Deputy CEO, Erer Farmers' Union, Debre Zeit
Bekele Seboka, Extension Officer, Ada'a-Liben *Woreda* Agriculture Bureau, Debre Zeit
Dechasa Boye, Head, Ada'a-Liben *Woreda* Agriculture Bureau, Debre Zeit
Field visits and discussion with farmer groups in Godino and Ude Primary Co-operatives,
Ada'a-Liben *Woreda*

Improving Productivity and Market Success (IPMS) of Ethiopian farmers project Working Papers

1. Berhanu Gebremedhin, Hoekstra D and Azage Tegegne. 2006. *Commercialization of Ethiopian agriculture: Extension service from input supplier to knowledge broker and facilitator.*
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Federal Democratic Republic of Ethiopia
MINISTRY OF AGRICULTURE AND
RURAL DEVELOPMENT