

Production and Marketing of Kabuli Chickpea Seeds in Ethiopia: Experiences from Ada District

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ACRONYMS

ABSPPC	Arsi Basic Seed Production and Processing Centre
CIMMYT	International Maize and Wheat Improvement Center
DZ	Debre Zeit
DZARC	Debre Zeit Agricultural Research Centre
EIAR	Ethiopian Institute of Agricultural Research
EFU	Erer Farmers Union
ESE	Ethiopian Seed Enterprise
FBSPMS	Farmer Based Seed Production and Marketing Scheme
FLIP	Food Legumes Improvement Program
ILRI	International Livestock Research Institute
IPM	Integrated Pest Management
IPMS	Improving Productivity and Market Success of Ethiopian Farmers
ICRISAT	International Crops Research Institute for Semi-Arid Tropics
Ha	Hectare
MoARD	Ministry of Agriculture and Rural Development
MRR	Marginal rate of return
NGO	Non-government organization
OPVs	Open pollinated varieties
PA	Peasant Association
Qt	Quintal

1. Introduction

Chickpea production using residual moisture at the end of August has become an integral part of the teff and wheat production systems in the vertisols of the Ethiopian highlands where it is rotated with the cereals for enhancement of soil fertility.

Chickpea generates cash income and improves food and nutritional security for smallholder farmers. In the past the food preparations were mainly by way of roasting or boiling but now this has increased to include the making of flour for preparation of sauce used in eating Injera, the most popular Ethiopian soft bread made from teff and other cereals.

Seed has two important functions, as a carrier of genetic information of a particular crop or variety and as a commodity whose physical qualities are often not immediately obvious at the point of exchange (Tripp, 2001). The genetic information determines the agronomic performance of the variety and qualities of harvested grain. The seed system involves the whole process of variety development and release, seed production and distribution and the strength of any seed system is as strong as its weakest individual components. Seed systems are generally divided into two types: the formal and the informal. Formal systems are externally regulated through the application of rules and regulations governing both the production and distribution of seed, which is increasingly undertaken by specialized companies operating along commercial lines although public seed companies also exist. These companies tend to market seed through appointed distribution and retail channels. Informal systems are not externally regulated and are particularly important in serving the needs of smallholder farmers who use own-saved seed from the previous harvest and/or seed accessed from friends, relatives and local markets. Other important sources of seed

are seed relief programs operated by governments and NGOs, and much of this seed is sourced from the formal sector and distributed free or at subsidized cost.

Furthermore for farmers to maximise on utility of seed acquired from any source, they seek information about positive attributes of the variety, seed purity and viability at the point of exchange or market. This makes markets and available information about variety choices integral components of seed systems

In Ethiopia, the seed system reforms show limitations of focussing on supply or regulation in isolation, and ignoring the social actors in local seed systems. The Farmer-Based Seed Production and Marketing Scheme (FBSPMS), which is the core subject of this report, sought to augment supply through more decentralized on-farm seed multiplication, but decisions on what to multiply remain largely top-down, and not responsive to demand with the exclusion of small scale seed merchants who possess great potential to meet seed demand in rural areas (Mcguire, 20005).

While Desi chickpea has been widely grown in Ethiopia for household food needs and domestic markets, production of Kabuli types is a fairly recent practice. Lack of a viable seed supply system has affected the availability of improved Kabulu and Desi type chickpea to smallholder producers. Traditionally, the Debre Zeit Agricultural Research Centre (DZARC), under the Ethiopian Institute of Agricultural Research (EIAR), has provided chickpea breeder seed to the Ethiopian Seed Enterprise (ESE) which in turn multiplies it to produce pre-basic and basic or foundation seed in its own farms. The ESE then sells the foundation seed directly to contracted farmers for multiplication of certified seed that is sold to the agricultural extension departments for distribution in the different regions.

In recent years, new Kabuli type varieties have been developed and released in Ethiopia. Large seeded Kabuli type chickpeas are in high demand in export markets and fetch significantly higher prices than Desi types. Enhanced commercialization of chickpeas would therefore require better seed supply systems and institutional arrangements that can improve access to high quality seeds of improved varieties by the small producers. In the case of Ada district, the Erer Farmers Union (EFU) also obtains basic seed of Kabuli types from ESE and DZARC for production of certified seed by and for their membership. The DZARC has also provided seed directly to farmers for demonstrations and on-farm trials. Meanwhile, seed producing farmers in Ada, Akaki and Gimbichu districts have complained that ESE and EFU pay them very low prices for the certified Kabuli seed and caution that this may make them stop seed production altogether.

Therefore, an investigation was undertaken to determine the current status of Kabuli seed systems, understand the incentive problems in seed production and marketing, and identify any bottlenecks and attendant opportunities for improvement in order to improve efficiency and sustainability of Kabuli seed production and marketing in the study area.

2. Methods

Discussions were held with a number of stakeholders and collaborating institutions (IPMS-ILRI, ESE, EFU, MoA for Ada , DZARC) as well as smallholder chickpea producers and seed farmers in Ada district to understand the current state of the seed supply system and the role of the different agencies in improving availability and

accessibility of Kabuli seed by smallholder farmers. Seed and grain producers were selected from purposively selected Peasant Associations (PAs) known for growing the new Kabuli varieties (Arerti, Shasho and FLIP). Farmers' focus group discussions (Photo 1 in appendix 2) were also held in the community. The investigation was unfortunately conducted at a peak labour demand period for farmers with the majority busy harvesting, transporting and threshing teff and wheat, and therefore fewer farmers than expected attended group discussions.

Discussion groups comprised about 4-5 farmers. Four seed and two grain producing groups participated in the discussions separately. Generally group responses were elicited for qualitative information after a consensus was achieved while individual responses were sought for the quantitative information.

3. Analytical framework

The performance of seed systems in many developing countries is determined by the functioning of various individual components and institutional arrangements along the production and the supply chain and the potential economic benefits derived from the use of available seed materials along the value chain. Technical performance of various seed producing (supply side) and utilizing (demand side) institutions further depends on the level of expertise and accessibility to new information and the level of interaction and knowledge exchange between the two systems. Therefore this study uses this broad perspective to analyze and interpret qualitative and quantitative data gathered at various levels so as to determine and compare technical seed production and marketing efficiency of the two groups of seed farmers - ESE and EFU seed producers.

Consequently the study assesses and identifies the respective strengths and weaknesses in order to come up with strategic interventions that will make the two institutional arrangements complimentary to each other and therefore improve their efficiency in seed production and marketing. Further, quantitative and qualitative data from various groups of seed producing and consuming farmers will be analyzed to determine their respective level of efficiency, weaknesses and, consequently, opportunities for improvement. The price data from local traders is analyzed to help determine suitable seed pricing schemes in the study area.

4. Ethiopian Seed Enterprises

The ESE, wholly state owned and with 6 sub-branches nationwide, started its operations in 1978 and has evolved to be the sole producer and marketer of certified seed of cereals and legumes in Ethiopia. The most important cereals in ESE's seed business are maize, wheat, malt and food barley, teff, sorghum, millet and wild oats – the last being for animal feed. The most important legume seeds produced are haricot beans, field pea, chickpea, lentils, faba bean and soybean. All together ESE produces and markets 64 different varieties of crops nation-wide.

4.1 Distribution of basic and certified seed

The ESE stopped producing seed of improved Desi varieties about 4-5 years ago due to lack of demand by farmers. The Desi varieties were unpopular with farmers due to susceptibility to diseases and their colour made them less marketable.

In 2003, the ESE started producing and marketing seeds of the Kabuli varieties Shaso and Arerti (Figure 1). The ERER Union buys certified seed from ESE in cash and in-

turn sells on credit to farmers through the primary cooperatives. The farmers are required to pay 25% in advance and charged 5% as interest on the balance payment which is collected on delivery of chickpea to the primary cooperatives, a variant of the promising inventory credit approach used widely in many countries. This relationship is very important to both agencies and plays an important role in the distribution of seed of improved varieties.

The ESE's Arsi Basic Seed Production and Processing Centre (ABSPPC) is in the wheat zone and not ideal for chickpea production. Nevertheless a planting of breeder seed of 80 kg per ha produces 1000-1200 kg per ha of pre-basic seed, while a pre-basic seed of 100 kg per ha also yields 1000-1200 kg per ha of basic seed. The amount of basic seed of Shaso and Arerti varieties of Kabuli chickpea produced by ABSPPC is given in Table 1. In 2004 basic seed of Shaso and Arerti were distributed in several areas for production of certified seed. However in 2005-06-season only Arerti was distributed in Ada, Akaki and Gimbichu mainly because of better germination in these areas. Shaso germinated less in low moisture conditions than Arerti, while both had poor germination under high moisture conditions. Timing of planting when soil moisture is at optimum level is critical for good Kabuli chickpea establishment.

Although Shaso is larger seeded than Arerti, the size is not big enough to compete effectively in international markets. However Flip, introduced from Turkey, Ejere and Teji (released by DZARC in 2005) are larger seeded and could compete well in the international Kabuli market. Although seed of Flip is already under multiplication,

there is a shortage of certified seed of the newly released varieties (Ejere and Teji). Farmers also indicated that the large-seeded Kabuli types are more prone to theft.

The ESE-contracted seed producing farmers are selected by ESE staff in consultation with woreda staff of the MoA. The seed producers are selected on the basis of ‘ownership’ of adequate land, willingness to meet the isolation distance, and availability for inspection by woreda MOA technical staff and compliance with recommendations.

Contracts that the ESE has with individual farmers in Ada stipulate that:

1. The farmer has to produce good quality seed under recommended procedures
2. The farmer can retain 10% of produce for own use or seed exchange with other farmers
3. The ESE pays a premium of 15% over the prevailing grain price at the time of harvest

Despite this contract agreement, the seed recovery rate is about 60%, some farmers default in anticipation of better prices as the surplus declines closer to the planting time. This indicates that the price of Kabuli grain fluctuates by more than 15% to make it attractive for farmers to withhold seed to be sold later as grain. Furthermore, ESE seed producers reported that they had a verbal and not a written contract with ESE for the production of Kabuli seed.

The woreda MoARD extension and ESE staff reported training of the seed farmers on production techniques indicated below through seminars, field days and demonstrations:

1. Seed production on vertisols
2. Isolation techniques
3. Rouging for purity

This training seems to be sufficient to enhance the capacity of small producers in methods and practices for quality seed production; although most farmers reported that the training was inadequate.

The amount of certified seed produced and recovered from contract farmers supplied with basic seed by ESE from their Kabuli chickpea basic seed farm at Arsi is in Table 2. In general, the contracted farmers used a seed rate of 100 kg (1 quintal) per ha to produce about 1800 kg per ha of certified seed with a recovery rate estimated at 60%. The forty percent un-recovered seed includes 30% for defaulters and 10% retained by seed producers as own saved seed as stipulated in the contractual agreement.

Analysis from the recovered certified seed showed a low multiplication ratio of 9 for Kabuli seed – indicating that 1 kg of basic seed of Kabuli produced only 9 kg of certified seed. Productivity of basic seed of Kabuli varieties was about 1 ton per hectare, excluding 30% for defaulters and 10% retention for own saved seed. But the overall productivity was about 1.8 tons or 18 quintals per ha and it would be interesting to compare these figures with other chickpea seed producers.

4.2 Pricing and economics of production of certified Kabuli seed

The ESE contracted farmers have produced mainly certified seed of Shaso and Arerti Kabuli varieties. The ESE usually pegs the purchase price of certified seed produced

by these contracted farmers at 15% above the prevailing grain price at harvest. Some interesting issues to be investigated are whether:

- a. the seed farmers are consulted in price determination?
- b. the grain price used for seed-price determination is for Kabuli or Desi?
- c. the price determination process is spelt out in the contract and well understood by the seed farmers?

The sale price of basic seed and purchase price of certified seed are in Table 3. In 2004 ESE sold basic seed to farmers at 350 birr per quintal and the farm-gate price for certified seed of Kabuli was 260 birr per quintal in the same year. Seed farmers from ESE and EFU, however, reported that the average purchase price of basic seed was 457 birr per qt and that they sold certified seed to EFU and ESU at average price of 281 birr per qt (Table 16). Making use of the results from section 4.1, Tables 16 and 22, marginal rate of return (MRR) using the incremental benefit and cost approach (CIMMYT, 1988) for Kabuli seed and grain production can be estimated assuming that only the cost of seed for production of Desi, Kabuli grain and certified seed varied while all other costs and yield did not differ significantly. This approach further assumes that farmers who currently produce Desi grain have three technological choices: continue with Desi grain production or start producing either Kabuli grain or seed. The price of basic seed of Kabuli which was 457 birr per quintal (Table 16) and price of seed for Kabuli and Desi grain production from the informal sector was 298 and 213 birr per quintal (Table 22), respectively- inclusive of 10 birr per quintal as estimated cost of transport. Other information used in estimation of MRR are:

1. ESE seed farmers used a seed rate of 1 quintal per ha
2. Kabuli seed productivity for ESE seed farmers was 18 quintals per ha
3. Desi and Kabuli grain prices at harvest were 166 and 240 birr per quintal respectively, assuming 10 birr per quintal as transport cost met by the farmer.

Assuming that farmers sell most of their produce at harvest, the estimated marginal rate of returns for Kabuli seed and grain production are in Table 4. Production of Kabuli grain or seed compared to production of Desi grain showed very high MRR (CIMMYT recommends that any MRR of at least 100% is acceptable to resource poor farmers). MRR for Kabuli grain production (with Desi grain production as the traditional practice or control) was almost double that for seed production. With every one birr invested in Kabuli recycled seed, additional 15.67 birr was generated in production of Kabuli grain, while every birr invested in purchase of basic seed generated additional 8.15 birr in Kabuli seed production. So with certified seed bought by ESE or EFU at a price of 281 birr per quintal, farmers were better off producing Kabuli grain and marketing it to local traders in Debre Zeit at grain price of 240 birr per qt. A question worth asking is: what seed price would allow the seed farmers to attain the same MRR as Kabuli grain producers? Using simple math to work backwards shows that ESE or EFU would have to pay 387 birr per qt for certified seed produced by their farmers in order to make it as attractive as Kabuli grain production. Price expectations for seed producers were in the same range (355-412 birr per qt) as shown in Table 17. Further sensitivity analysis can be done to show how farmer incentives vary as you vary yield, cost and prices. A lower MRR (using Desi grain production as the traditional practice) for Kabuli seed or grain production

will be realised when the cost of guarding and spraying is factored in- but these expenses are common to Kabuli seed or grain production enterprises.

5. Erer Farmers Union

Erer Farmers Union (EFU) started in 1998, with only 7 primary cooperatives in Ada and with a capital outlay of Birr 190,000. Presently, in addition to Ada, it has extended to Akaki and Gimbichu with 39 primary cooperative affiliates with a total membership of 35,336 farmers and capital outlay of about 4 million Birr. The main objective of the EFU is to improve productivity of small farmers by enhancing accessibility to modern inputs through provision of fertilizers, seed and pesticides at cost to the farmers. They are also involved in grain marketing and value addition activities aimed at enhancing demand for grains in order to increase farm-gate prices and incomes for small farmers. Their other important function is to provide credit to affiliate primary cooperatives. The ESE uses this credit facility to sell basic seed and certified seed to farmers all of which are members of the EFU.

Important grains they market include teff, wheat and chickpea, among others. The MOA staff in Ada bureau is an important partner and helps in selecting EFU's Kabuli seed farmers and in ensuring that recommended agronomic practices are employed by farmers in chickpea seed production, and ensuring that high seed quality is maintained. EFU's seed producers, however, reported that training and monitoring visits were inadequate.

5.1 EFU's Kabuli seed production model

EFU's Kabuli seed production model is in Figure 2. The model has done a great job of quickly increasing the seed of Kabuli types because EFU continued to even buy the first generation from certified seed as seed and not grain. This model which resembles farmer-farmer seed model should be treated with caution as farmers continue to demand the seed price for the grain they sell to EFU. This is not sustainable. Due to the huge quantities of grain bought as seed, EFU has not been able to sell all their "seed" stock because of over supply. For example in 2004 EFU bought 323 t (3,229 qt) of first generation seed (mainly produce from certified seed planted in the previous season) but was able to sell only 96 t (957 qt) back to their member farmers as seed for 2005 planting season. The balance was fortunately purchased by a South African firm, Ropack, at the time of this study (Photo 4 in the appendix 2). At the end of this season they expect Kabuli chickpea production 1500-2000 t (15,000-20,000 qt). The 1500-2000 t is again produce from "saved" grain which was purchased from member farmers as "seed" in 2004. Although there is a guarantee from one buyer to purchase about 1000 t (10,000 qt) as grain, finding a buyer for the balance is uncertain. EFU would be well advised to undertake the following urgently:

1. Appreciate that there is difference between seed and grain
2. Forecast demand for seed each season and use only basic seed to produce certified seed, if the board feels strongly that they must continue to produce and market seed. Otherwise they should buy certified seed from ESE, which has a comparative advantage in seed production.
3. Grain from certified seed should strictly be treated as grain and bought as grain and **not as seed**, as is the norm now

4. Seed farmers, should be above average farmers in management capability and should be distinguished from grain farmers or seed quality could be greatly compromised (Figure 3).
5. EFU has done a good job of promoting and popularizing Kabuli production and should now concentrate on their core business of grain marketing while leaving seed production to ESE
6. EFU should continue to link grain producers to high quality seed from ESE through provision of credit facility for seed purchase through the primary cooperatives
7. If EFU wishes to continue seed production, it should aggressively sensitize their seed and grain producers to appreciate the difference between seed and grain and put in place a strict quality monitoring and inspection mechanism which currently is lacking
8. Aggressively seek and develop domestic, regional and international market linkages for Kabuli grain

This implies that EFU should not be buying grain “seed” produced from certified seed as seed, but as grain. This will clarify the current confusion that this has created in the minds of Kabuli farmers, who feel exploited for receiving grain prices for seed sold to EFU. The recommended model is shown in Figure 3. This proposed model has 3 important aspects:

1. Certified seed producers are different from grain producers
2. Certified seed is produced from basic seed only
3. Two distinct production units in EFU – seed and grain production units

The two distinct seed and grain production units are proposed not only to appreciate the distinct difference between seed and grain but more importantly to avoid physical mixing of grain and seed leading to reduced quality. This separation of units should also lead to easier price determination process for seed and grain, respectively.

5.2 Production and price determination of Kabuli seed

EFU purchased basic seed of Arerti, Shaso and Flip from DZARC which they in-turn sold to their members for bulking of certified seed. EFU bought the “certified” seed and sold it to other members for grain and/or seed production. During the assessment discussions with EFU staff it was difficult to nail down the exact amounts and prices of different Kabuli seed products from EFU records. Tables 5 shows an extract from EFU records of amount and price of different categories of Kabuli seed purchased and sold by EFU between 2002 and 2005. In 2005 planting period EFU had a balance of 131 and 2,141 quintals of Flip and Arerti/Shaso, respectively unsold. This amount was later sold as grain to a South African company in December of 2005. EFU expected a production of 15, 0000 - 20,000 quintals of Kabuli grain/seed from their membership from 2005 season. Generally EFU’s main objective was not to profit from Kabuli seed business but to promote Kabuli grain production and marketing amongst its membership. Price of seed purchased from farmers is based on grain price at harvest + 30 Birr. More on price determination is discussed in the next section. Furthermore EFU reports having purchased 98 qt of certified seed in 2004 and 2005 respectively at 350 Birr q^{-1} from ESE.

5.3 Seed multiplication ratio by EFU

At the time of the study EFU was producing two categories of seed (Table 6) – certified (C) and certified 1(C1). Certified was seed produced from Basic seed while C1 was seed produced from certified seed. Seed multiplication ratio from the two categories of seed is in Table 6. In an earlier section it was strongly recommended that EFU treat the second category of seed as grain and not seed. Certified seed (C) multiplication ratio in EFU was 5 for Shasho, Arerti and Flip combined- lower than that reported by ESE which was 9.

5.4 Seed pricing by EFU

The pricing of seed by EFU was slightly different from ESE's pricing but still based on the going price of grain in the market at the time (Table 7). As Ethiopia enters the international market for Kabuli grain, EFU should begin to tailor their grain pricing to that of the international markets in order to remain competitive and relevant.

6. Seed Production and Marketing Systems

As has been discussed ESE and EFU as seed production and marketing institutions had operational and technical efficiency similarities, differences and problems some of which are summarized in Table 8 and 9.. The problems hinged on both Kabuli seed and grain supply and demand aspects.

6.1 Agronomic and market qualities of available Kabuli and Desi varieties

One of the problems leading to this assessment study was unavailability of seed for large seeded Kabuli types (> 38 gm for 100 seed weight) that could compete

favourably on the international grain market. The newly released varieties (Ejere and Teji) by DZARC seem to meet preferred agronomic and marketing traits (Tables 10-11). However, all the released varieties are susceptible to bollworms and therefore bollworm control is an important management recommendation in seed and grain production. All released improved Kabulis have good tolerance to wilt as they all passed through the wilt-sick plot test at DZARC and are well adapted to highland vertisols with altitude of 1800-2400m asl and rainfall of 700-1200 pa. All the Kabuli varieties are semi-erect with recommended sowing time of mid August except DZ-104 which is sown in early September. The varieties Teji and Ejere can compete favorably on the international chickpea grain market. However support is urgently required for production of basic seed by DZARC and the basic seed can subsequently be channeled to production of certified seed for grain producers.

Although the new Kabuli varieties have some level of tolerance to ascochyta blight, to avoid build up, suitable rotation regime should be maintained with cereals.

Additionally for high productivity of Kabuli seed and grain, seed treatment, timely planting (in relation to level of soil moisture-larger seeded Kabulis have poor germination under high soil moisture condition) and spraying against bollworms will be essential. Ridge planting may also reduce the problem of poor germination caused by water logging. Spraying 1-2 times, depending on infestation threshold, will suffice.

Although Kabuli is 98% self pollinated, some genetic deterioration may begin to set in after 4-5 years during which farmers will have to renew their seed with fresh high quality seed.

The amount of breeders or basic seed of Teji and Ejere available for initiation of seed bulking work should be established and bulking should begin under off-season irrigation in readiness for certified seed/grain production in August 2006. Going hand in hand with this initiative, development of international market outlets for Ethiopian Kabuli chickpea is urgent. For the time being EFU and ESE should also be aware of international market prices which they should use as a basis to set their pricing schemes with their farmers. To penetrate international markets, farmers have to remain competitive by using high quality seed with suitable agronomic and market attributes, increasing productivity and improving grain quality.

6.2 Kabuli seed production and marketing: farmers' perspective

Production and productivity

EFU and ESE seed farmers were selected on the basis of innovativeness and accessibility by road. The PAs feedback on seed production and marketing is on Table 12.

Seed quality

Farmers were asked to assess whether the quality of seed planted from ERE and ESE was good or poor in terms of yield, germination and purity (Table 13). Farmers' responses indicated that ESE produced higher quality seed than EFU. Lack of seed treatment by EFU during seed processing contributed to poor germination of the seed.

Varietal preferences

Although Table 14 shows no significant yield differences between Arerti and Flip, Arerti was the most preferred by most farmers for its high productivity. For majority of farmers descending order of preference for high productivity was Arerti, Flip and

Shasho. In addition to high productivity, Arerti was preferred because it had better stand establishment (less sensitive to high soil moisture conditions) and was less affected by wilt and bollworms. However farmers with higher management capacity (timely planting, treated seed and recommended field pest control) preferred Flip the most due to its good taste when eaten green, but the good taste has its own problems, as explained in a later section. Preference order for seed size was 1) Flip 2) Shasho and, 3) Arerti

Seed production practices

As discussed earlier ESE produced higher quality chickpea seed because it invested more resources in seed quality enhancement than EFU (Table 15). All farmers' groups interviewed agreed that some seed and grain production practices were different, including field selection, rouging, threshing on clean surfaces, sorting and seed quality control aspects. However, there was no deliberate effort by either ESE or EFU to train seed producers in recommended seed production technologies. The farmers further said that the main differences between production of Kabuli and Desi chickpea were that Kabuli required guarding against theft in field, more thorough field insect control and better timing of planting, when the soil moisture was just right.

Credit access, pricing and marketing

Seed producers' responses to some qualitative aspects of seed marketing are in Table 16. Farmers were satisfied with sizes of seed packages, the smallest of which was enough for $\frac{1}{4}$ ha of land. Seed farmers purchased seed for the 2004 planting at 424 and 490 Birr per quintal from EFU and ESE respectively, and sold the subsequent seed produced at an average price of 290 and 272 Birr per quintal to EFU and ESE

respectively. ESE officials reported that they involved their farmers in setting the prices by carrying out some price assessment in the local market before paying 15% premium for seed above the Desi grain price, while EFU did not involve their farmers in price setting and simply paid 30 Birr per quintal premium above the Desi grain price. During the same period farmers in Ganda Gorba, Debre Zeit, reported selling grain at the local market at an average of 203 and 315 Birr per quintal of Desi and improved Kabuli respectively. With or without farmer involvement in price setting, both ESE and EFU seed farmers were generally not satisfied with prices received from the 2004 chickpea crop as EFU and ESE had offered much higher prices in the first season of seed production. Furthermore the price setting process should have used the price of Kabuli grain and not Desi grain as a base for the process notwithstanding the fact that Kabuli grain market was still underdeveloped.

The seed farmers were asked what would be an acceptable price of Kabuli seed and grain given varied prices of Desi grain in the local market. The responses are in Table 17. Farmers expect Kabuli grain prices in the market to be at least 40% higher than Desi prices. It would be interesting to compare farmers' expectations to world market prices for Kabuli, as Kabuli is mainly an export crop. If need be the world market prices should be used to set farm gate prices that would make Ethiopian Kabuli grain production a competitive enterprise in Ethiopia targeting the world market.

Farmers expect Kabuli seed prices to be at least 65% higher than price of Desi grain and 17-23% higher than Kabuli grain in the local market. It is therefore recommended that for Kabuli seed ESE and EFU pay a premium of about 15-20% above the local

price of Kabuli grain at harvest time. Farmers' expectations may be inflated in hoping to attract higher prices from ESE and EFU.

Although there was insufficient data to disaggregate price expectations to various Kabuli varieties, HIDI seed group indicated that they expected higher prices for seed and grain of Flip than Shasho and Arerti (Table 18). Farmers expect about 15% higher prices for Flip grain and seed than prices offered for Arerti or Shaso.

Farmers also compared price fluctuations for Desi and Kabuli grain in the local markets at harvest time, 6 months after harvest and planting time in August (Table 19). Price of Desi and Kabuli grains increase by 22% and 37%, respectively between chickpea harvesting time and planting time. Therefore farmers who can store Kabuli grain up to time of planting expect to sell at 327 Birr per quintal.

7. Chickpea Production and Marketing Problems

The most important Kabuli chickpea seed production problems were, in descending order of importance, poor market, pests and diseases (bollworms, cutworms and wilt), and theft in the field especially of the big seeded Flip and Shasho varieties (Table 20). For poor markets, farmers said that development of local and international Kabuli chickpea grain markets through enhancing local utilization and value addition and linkage to more lucrative and reliable international markets could improve markets for both seed and grain. Reduction of bollworm damage which was reported to be more serious in the larger seeded Kabulis (Photo 3 in appendix 2) requires use of IPM including judicious use pesticides. Provision of input (pesticide) credit to farmers who

are unable to buy pesticides could also help increase the quantity and quality of chickpea seed and grain. The best solution to the cutworm problem is use of seeds treated with chemicals during seed processing. Wilt resistant germplasm and rotation could reduce wilt damage. Increase of acreage of Kabuli chickpea and number of farmers growing them would reduce losses from theft.

7.1 Chickpea traders and seed system

One of the questions to be answered by the rapid assessment was whether chickpea grain traders in Debre Zeit could play any role in formal seed system of Kabuli chickpea by retailing certified seed. All the nine traders (3 small, 3 medium and 3 large) all responded in the negative and gave various reasons: anticipated low turn over, no supply of certified seed and farmers were unfamiliar with certified seed of chickpea. Pressed further, small, medium and large traders said they would be willing to sell some Kabuli seed if and only if the maximum purchase price of the seed is 292, 288 and 295 Birr per quintal respectively with a minimum anticipated gross margin per quintal of 10, 15 and 18 Birr for small, medium and large traders, respectively. Nevertheless trade in chickpea grain was important (Table 21) indicating that the traders played an important role in informal seed system of chickpea. Small grain traders handled an average of about 65 and 123 qt of Kabuli and Desi grain, respectively in 2004, while the medium traders handled an average of about 350 and 620 qt of Kabuli and Desi, respectively during the same period. The large traders traded in an average of about 1,133 and 4,200 qt of Kabuli and Desi grain, respectively. Small, medium and large traders sourced grain from farmers, assemblers and other traders at indicative average purchase prices on Table 22. Although inferences should be drawn cautiously due to small sample of traders interviewed,

indicative purchase prices for chickpea grain from farmers and assemblers did not differ significantly.

7.2 Recommended seed pricing scheme

The fluctuation in grain prices often affects the seed prices in the informal seed sector. Main sources of purchased seed from the informal seed sector generally are other farmers and local market traders. Table 23 details the fluctuation of chickpea grain purchase and sales prices in Debre Zeit. Traders' grain purchase prices approximate seed prices from other farmers while traders' sales prices approximate seed prices from local traders. Farmers without saved seed in 2005-06 season purchased seed from other farmers and local traders at about 270 and 285 Birr per quintal, respectively. Of course these prices varied with chickpea variety- highest in Flip and lowest in Desi.

A logical question that should be asked is why the farmers' sale prices at harvest, 6 months later and at planting (Table 19) were higher than those quoted by the buyers or traders (Table 23)? First, due to small sample size, these prices are only indicative. Furthermore, farmers' responses on prices were speculative, hoping to influence the price paid to them for seed by ESE and EFU.

Price of chickpea grain at planting and farmers' expectations (20% above Kabuli grain prices at harvest) are recommended for possible use in setting seed prices paid to farmers by EFU and ESE. These prices are summarised in Table 24. It can be seen that farmers' seed price expectations are not significantly different from the grain prices at planting.

8. Summary and Conclusions

The seed system for Kabuli chickpea production in Ethiopia is in its infancy. Starting in 2002, DZARC produced breeder seed of Kabuli type and sold it to ESE who in turn produced basic seed in their own farms. EFU and ESE have used selected members of EFU as out growers to produce seed for sale to grain producers. Seed producing farmers, however, have complained that they received low prices for seed produced and threatened to stop seed production altogether. On the other hand, previous marketing work indicated that the available Kabuli chickpea varieties were too small (<37gm per 100 seed weight) to compete favorably on the international Kabuli chickpea grain market. Informal assessment was conducted through checklist interviews with major seed sector players including DZARC, ESE, EFU, some seed and grain producing farmers, private traders and extension in order to identify weak links in the seed system and to recommend sustainable strategies for improvement.

EFU produced and marketed a combination of certified and recycled certified seed to popularize the production of improved Kabuli varieties through their Cooperative infrastructure of input credit and grain marketing activities. ESE had a higher seed quality control system than EFU which should now cease seed production activities and concentrate in purchasing high quality seed from ESE for distribution to their members for grain production and marketing. EFU should oversee that their members produce high quality Kabuli grain and link their members to international Kabuli grain markets. ESE on the other hand, should increase their capacity to produce high quality seed of Teji and Ejere varieties basing their production targets on projected

demand for seed while DZARC should also step up their capacity to regularly supply ESE with required breeder's seed.

The main biotic and abiotic constraints limiting production cited by farmers were poor market, pests (appendix 2), diseases and human theft. Market linkage, demonstrations on IPM and judicious use of chemicals, seed dressing, timely planting and provision of input credit could help overcome these constraints. Although average grain productivity was about 19 qt per ha without any significant yield differences between the varieties, most seed farmers preferred Arerti due to its better stand establishment followed by Flip and Shasho last. With improved management (seed dressing, timely planting, use of chemicals sprays against bollworms etc.), Flip would be most preferred due to higher grain prices and better taste. Farmer training on production of high quality grain and seed by using improved recommended management practices especially IPM and high quality seed should be demonstrated to both grain and seed producers.

ESE should have a consistent seed pricing strategy that takes into consideration farmers' resource allocation choices and market requirements. Production cost of seed and price of Kabuli grain at harvest and at planting should be important benchmarks used in seed-price setting. The feedback from traders showed that grain prices at planting time (an indication of seed prices from the informal sources) in 2004 were about Birr 269 for Arerti, 285 for Shasho and 310 for Flip per qt. These prices averaged about 20% above the respective Kabuli grain prices at harvest and were close to farmers' seed price expectations. Grain pricing, however, should be linked to the international prices for Kabuli chickpea.

MRR analysis showed that at the current grain and seed prices of 240 birr and 281 birr per qt, respectively, farmers have higher incentives to produce Kabuli grain and not seed. In fact for incentives in seed production to equal that of grain production the farmers need a farm gate price of 387 birr per qt. Nevertheless with increased production of Kabuli grain, the Kabuli grain prices are bound to fall and improve seed production incentives.

The last question to be answered by the rapid assessment was whether there were Kabuli varieties in Ethiopia with large enough seeds to compete favorably on the international market for chickpea. The assessment showed that there were two Kabuli varieties with 100 seed weight greater than 37gm. These were Teji and Ejere, all with acceptable agronomic and market qualities. The constraint was the absence of a sustainable system to produce enough breeders and basic seed and low capacity of ESE. This report suggests that production of breeders' seed should begin in 2006 during off-season by irrigation in readiness of initiation of seed bulking by ESE and/or EFU in August 2006. Promotions through demonstrations, field days and regular training were also inadequate and should be enhanced.

All local traders interviewed responded that they had no desire to stock certified seed of Kabulis. The reasons range from lack of seed stocks to low anticipated turnover as traders are concerned that farmers may be unfamiliar with the new varieties.

Therefore, local primary cooperatives will have to continue to play an important role in distribution and marketing of certified seed.

From a seed systems improvement perspective, the strengths of the existing Kabuli seed system in Ethiopia are two fold: it is a smallholder based production and the distribution and marketing of certified seed is mainly done by a strong farmer organization that at the same time provides the seed on credit to its members and also assists in grain marketing. Furthermore DZARC has made a commendable work in development and release of improved Kabuli varieties, including Teji and Ejere which have the needed attributes to compete favorably in the global chickpea market. Nevertheless, the production of breeders' seed, especially of Teji and Ejere, is unsatisfactory and needs urgent attention.

The rapid assessment findings show that, although both Kabuli grain and seed production generated much higher benefits than production of Desi grain, Kabuli seed production was less attractive than Kabuli grain production and seed farmers will opt for grain rather than seed production. Increasing the price of seed to about 387 birr per qt would make seed production as attractive as grain production but this would in turn make the seed too expensive, increase the cost of grain production and make Ethiopian Kabuli grain less competitive in the global market.

Improved Kabuli chickpea varieties being OPVs, many farmers will rely more on recycled seed leading to reduced demand for certified seed and ESE will find it less attractive in future to continue in Kabuli seed business (Muhammed, 2003). However, the demand for certified Kabuli seed could be enhanced through suitable farmer demonstrations on positive agronomic and market attributes of improved Kabuli varieties (Tripp, 2001) in addition to farmer-sensitization on regular renewal of recycled seed. The continued marketing of certified seed of Kabuli through EFU

which has a provision for credit to purchase seed is an advantage that strengthens further the delivery of certified seed to farmers (Muhammed, 2003).

Seed systems where formal and informal systems compliment each other are more resilient and efficient (Alminkinders, 1994). As a large proportion of farmers will continue to use recycled Kabuli seed for grain production they need to be sensitized to undertake regular seed renewal from the formal sector (3-4 year renewal rate is recommended by DZARC) and to obtain recycled seed from sources with reliable information on performance and positive agronomic and market qualities for the seed. Other farmers have reputation as the most reliable source of recycled seed although there are documented cases where some traders have stocked recycled seed whose sources and information on agronomic and market qualities they also have. Some of these traders in Debere Zeit could be identified, sensitized and trained to stock and market recycled seed whose economic value, agronomic attributes and sources they know and can communicate to the buyer effectively.

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Tables

Table 1. Amount of basic seed of Shaso and Arerti Kabuli chickpea that was produced and distributed for certified seed production in various districts in Ethiopia by ESE

Year	Year/variety	Amount of basic seed produced (kg)	Districts where basic seed was distributed for production of certified seed
2003	Shaso	200	Akaki
	Arerti	1100	Ada, Gimbichu, Akaki
2004	Shaso	4750	Ada, Gimbichu, Akaki, and Lume
	Arerti	3163	Same Adas
2005	Shaso	2625	Akaki, Dawo and Bacho
	Arerti	7325	Ada, Akaki, Gimbichu, Lumi

Source: Staff of ESE-Arsi Basic Seed Production and Processing Centre in Arsi, Asela

Table 2. Amount of certified seed of Kabuli produced by ESE contract farmers in Ada, Akaki and Gimbichu districts of Ethiopia

Year	Year/ Variety	Amount (kg) of certified seed bought	Multiplication ratio	No. of farmers	Area (ha)	Amount (kg) certified seed per farmer	Certified seed productivity per ha
2003	Shaso	2447	12	24	13	421	776
	Arerti	7646	7				
2004	Shaso	40600	9	146	48	429	1304
	Arerti	22000	7				
2005	2005	-	-	111	100	-	-
Mean	Shaso	21524	11	94	54	425	1040
	Arerti	14823	7				

Source: Staff of ESE-Arsi Basic Seed Production and Processing Centre in Arsi, Asela

Table 3. Cost of basic seed and purchase price of certified seed from contract farmers by ESE

Year	Cost (Birr/ qt) of Kabuli basic seed	Purchase price(Birr/ kg)of certified seed
2003	350	308
2004	350	260

Source: Staff of ESE-Arsi Basic Seed Production and Processing Centre in Arsi, Asela

Table 4. Estimated marginal rate of return (MRR) for Kabuli seed and grain production in Debre Zeit, Ethiopia

Item	Chickpea enterprise		
	Desi grain production	Kabuli grain production	Kabuli seed production
Yield (quintals ha ⁻¹)	18	18	18
Price of grain/seed (per qt)	166	240	281
Gross margins (birr ha ⁻¹)	2988	4320	5058
Incremental benefits (birr ha ⁻¹)	0	1332	2070
Cost that vary (seed birr ha ⁻¹)	213	298	467
Incremental cost (birr ha ⁻¹)	0	85	254
Marginal rate of return (MRR ¹)	0	1567%	815%

Source: MRR analysis using CIMMYT's incremental benefits and costs method using data from farmers, ESE and EFU

¹MRR = incremental benefits divide by incremental cost x 100

Table 5. Amount and price of different Kabuli seed types purchased and sold by EFU between 2002 to 2005

Variety/type of seed	Purchase		Sales	
	Amount (qt)	Price (birr/qt)	Amount (qt)	Price (birr/qt)
Shaso/Arerti:				
1.. Basic seed	38	350	38	380
2. Cerified seed	3141	290-400	1000	330-440
Flip:				
1. Basic	49	952	49	720
2. Certified seed	208	453	77	496

Source: discussions with EFU staff

Table 6. Seed multiplication ratios for two categories of seed produced by EFU in Ada, Ethiopia

Category of seed	Amount (qt) of seed used	Amount (qt) produced	Multiplication ratio
Certified seed (C)			
Shaso and Arerti	20	120	6
2. Flip	49	208	4
Certified seed (C1 ¹):			
Arerti and Shaso	138	3021	22
Weighted mean			16

Source: discussion with EFU staff

¹C1 is actually grain produced from certified seed (C)

Table 7. Kabuli seed pricing method used by EFU, Ada, Ethiopia

Category of seed	Pricing method
Certified seed	Grain price at harvest + 40 Birr
1 st generation certified seed	Grain price at harvest + 30 Birr

Source: discussion with EFU staff

Table 8. A summary of operational and technical efficiency differences and similarities between ESE and EFU in Kabuli seed production and marketing in Ethiopia

Parameters	Ethiopian Seed Enterprises (ESE)	ERER Farmers Union (EFU)
1. Objective	Productivity and farm income improvement through provision of high quality seed of improved varieties	Productivity and farm income improvement through provision of modern inputs (seed, fertilizers and pesticides) at cost, and credit and assist in grain marketing, including value addition
2. Seed supply orientation	Farmer-based production and marketing and respond to centrally established demands of package programmes and not to market demands for seed (Mcguire, 2005)	Farmer-based system using smallholders who must be members of their affiliate primary cooperative as growers and respond to package programmes and market demands
3. Categories of Kabuli seed produced	Certified seed	Certified seed and 1 st generation of certified seed
4. Key seed production practices	<ol style="list-style-type: none"> 1. Cooperate with extension only in farmer selection 2. Farmer selection criteria: operates large piece of land, active and innovative farmer, member of local primary cooperative and accessible by road 3. Site selection: field history and isolation distance observed 4. Seed treatment is done as part of seed processing 5. Seed rate 100 kg or one quintal per ha 6. Rouging done 7. Quality assurance by visits by ESE staff and external agency that samples seed for germination, seed purity and health tests 8. Staff of ESE train seed farmers 9. Farmers were not aware and/or clear on any contract agreement and the terms and conditions therein. 10. Mechanism for forecasting seed demand: none 11. Seed multiplication rate was 9 12. Transport cost met by ESE as seed was collected at farm-gate 	<ol style="list-style-type: none"> 1. Have a MoU with extension detailing roles 2. Farmer selection criteria: active farmer and member of primary cooperatives 3. No evidence of use of any criteria for site selection 4. Seed treatment was not done 5. Seed rate: 130 kg per ha 6. There was no evidence that rouging was done 7. Quality assurance through monitoring visits of extension staff 8. Seed farmers were trained by extension staff 9. Farmers were not aware and/or clear on any contract agreement and the terms and conditions therein.. 10. Mechanism for forecasting seed demand: none 11. Seed multiplication rate was 5 12. Transport cost was met by the farmer as seed was paid for at the farm-gate
5. Pricing	<ol style="list-style-type: none"> 1. Basic seed was sold to contract farmers at 350 birr per qt and other investors at 360 birr per qt 2. Certified seed was sold to EFU at 350 birr per qt 3. Certified seed from contract farmers was bought at 15% higher than the market price for grain 4. Mode of payment for farmers was cash on delivery at farm gate 	<ol style="list-style-type: none"> 1. Purchase basic seed from ESE or DZARC at 350 birr per qt 2. In the first year certified seed of Kabuli was purchased from farmers at 400 birr per qt and sold to other farmer sat 438 birr per qt 3. In subsequent years EFU purchase certified seed and 1st generation certified seed at 40 and 30 birr per qt, respectively, above the grain price in local market 4. Certified seed was sold to farmers at 330 and 496 birr per qt for Arerti/Shasho and Flip, respectively in subsequent years 5. Farmers were paid cash at the farm gate
6. Seed processing and packaging	<ol style="list-style-type: none"> 1. Clean, treat, package and label 2. Size of package seed producers 25 kg 3. Label: crop type, variety, category of seed, germination %, purity lot number and weight of seed 	<ol style="list-style-type: none"> 1. Clean, package and label 2. Size of seed package 32.5 kg 3. Label: crop type, variety, and weight
7. Credit	<ol style="list-style-type: none"> 1. No direct credit but seed distributed through EFU has a credit package for primary union members 	<ol style="list-style-type: none"> 1. Credit for seed purchase is extended to all members of the primary unions at 5.5% interest and repaid during marketing
8. Seed distribution network	<ol style="list-style-type: none"> 1. Seed was distributed to 6 branches in Akaki, Ada, Gimbichu, Dawo, Bacho and Lumi 	<ol style="list-style-type: none"> 1. Seed was distributed through 39 affiliate primary cooperatives in Ada, Akaki and Gimbichu

Source: Informal discussions with farmers, extension and staff from ESE and EFU

Table 9. Operational and technical efficiency problems faced by ESE and EFU

Ethiopian Seed Enterprises (ESE)	ERER Farmers Union (EFU)
1. Inadequate supply of breeders seed of Ejere and Teji Kabuli varieties 2. Low multiplication rate 3. Low recovery rate 4.. Inadequate training opportunities for seed farmers 5. Inadequate promotional activities for improved Kabuli varieties 6. Limited retail outlets for certified seed 7. Lack of mechanism for forecasting seed demand 8. Limited domestic market and unexplored international market for Kabuli grain	1. Lack of distinction between seed and grain in production and pricing 2. Inadequate seed quality control mechanisms 3. Lack of credit facility for pesticide purchase 4. Inadequate seed treatment with fungicide and insecticide during processing 5. Limited domestic market and unexplored international market for Kabuli grain 6. Inadequate farmer training for high quality grain production and marketing

Source: informal assessment results

Table 10. Some agronomic characteristics of Kabuli and Desi chickpea varieties officially released by DZARC for promotion and production in Ethiopia

Release name	Year of release	Origin	Yield potential (qt ha ⁻¹)		100 seed weight (g)	Maturity (days)	Seed rate (kg/ha)
			On-stn	On-farm			
Kabuli:							
1. Chefe	2003	ICARDA	30	30	28	93-150	110-140
2. Habro	2003	ICARDA	32	30	28	91-150	110-140
3. Ejere (Flip-97-263C)	2005	ICARDA	25	-	37.2	118-129	120-140
4. Teji (Flip 97-266C)	2005	ICARDA	28	-	38.1	122-130	120-140
5. Shasho (ICCV-93512)	1999	ICRISAT	31	31	25.7	90-155	100-125
6. Arerti (Flip 89-83C)	1999	-	34	32	25.7	105-155	100-115
7. DZ-104	1974	-	19	13	10.2	111-135	65-75
Desi:							
1. Marie	-	ICRISAT				Medium	
2. Worku	-	ICRISAT				Medium	
3. Akaki	-	ICRISAT				Medium	

Source: Dr. Million Eshete, National Chickpea and Lentil Research Coordinator, DZARC-EARO

Table 11. Some market preferred traits of Kabuli and Desi chickpea varieties officially released by DZARC for promotion and production in Ethiopia

Chckpea release name	Seed size	Colour
Kabuli:		
1. Chefe	Medium	Cream
2. Habro	Medium	Cream
3. Ejere	Large	Cream
4. Teji	Large	Cream
5. Shasho	Medium	Cream
6. Arerti	Medium-Large	Cream
7. DZ-104	Small	Cream
Desi:		
1. Marie	Small	Brown
2. Worku	Small	Golden
3. Akaki	Small	Brown

Source: Dr. Million Eshete, National Chickpea and Lentil Research Coordinator, DZARC-EARO

Table 12. Kabuli chickpea seed production and marketing in Ada district, Ethiopia in 2004 season

Peasant Association (N)	Number of farmers in group	Mean chickpea area (ha)	Total production in qt	Productivity qt/ha	Amount sold (qt)	Amount consumed (qt)	Amount retained as seed (qt)	No of times sprayed
Ude 1	4	0.75	16.5	22	15.63	0.38	0.5	1-2
Ude 2	4	0.5	9.88	19.75	bb	1.13	0.13	1-2
Ude 3	5	0.65	12.4	19.08	11.3	0.98	0.12	1-2
Godino	3	0.75	20	26.67	9	2.5	2	1-2
Hidi	8	0.53	4.13	6.82	2	0.21	0.15	0
Mean	5	0.64	12.59	18.86	9.12	1.04	0.58	0-2

Source: Informal group interviews with ESE and EFU seed farmers

Table 13. Farmers' quantitative and qualitative assessment of performance, germination and purity of Kabuli chickpea seed from ESE and ERER Union in Ada, Ethiopia in 2004 season

Seed producer	Sample of farmers	Production (qt per household)	Productivity (qt ha ⁻¹)	% reporting good yield	% reporting poor germination	% reporting mixed seed
EFU	17	12.86	19.79	48	50	50
ESE	4	9.125	18.25	50	0	0

Source: EFU and ESE seed growers

Table 14 Production and productivity of improved Kabuli varieties by EFU farmers in Debre Zeit, Ethiopia in 2004 season

Variety	Purchase price of seed (Birr/qt)	Production (qt per household)	Productivity (qt/ ha)
Arerti	403	11.75	15.16
Shasho	460	9.0	13.71
Flip	720	7.6	15.2

Source: EFU seed growers

Table 15. Seed production practices employed by ESE and EFU seed farmers in Debre Zeit, Ethiopia

Practice	ERER Farmers Union seed farmers	ETHIOPIAN SEED ENTERPRISE FARMERS
Teff/wheat –chickpea rotation	Most	Most
More thorough land preparation: up to 3 times	Few	Most
Use treated seed	None	All
More thorough weeding	Few	Most
Rouging (remove off types)	None	All
Use of recommended field insect control	Few	Most
Guarding plots against theft	Most	Most
Inspection	None	All; 3 visits by ESE staff at emergence, flowering and green pod stages
Seed certification	None	All
Threshing on clean floors	A few	All
Thorough cleaning	Few	All
Sorting	None	Most
Farmer training	None	None
Contracting arrangement	None	None

Source: Group discussions with ESE and EFU seed growers

Table 16. Chickpea seed producers' feedback on some aspects of chickpea seed marketing in Debre Zeit, Ethiopia (2004)

Marketing aspects	EFU	ESE
Average purchase price of seed (Birr/qt)	424	490
Average sale price of seed (Birr/qt)	290	272
Credit and terms of seed purchase	Down payment of 25% with balance paid at 5% interest rate	Down payment of 25% with balance paid at 5% interest rate
Credit on related inputs	None	None
Seed package	32.5 kg 65 kg	25 kg and 50 kg
Terms of seed sales	Cash on delivery	Cash on delivery
Cost of transport	Collected at farm gate	Collected at farm gate

Source: Group discussions with EFU and ESE seed farmers

Table 17. Prices of Kabuli seed and grain acceptable to farmers given varied Desi grain prices in the local markets in Debre Zeit, Ethiopia

Price of Desi grain in local markets (Birr/qt)	Prices acceptable to farmers (Birr/qt)	
	Kabuli grain	Kabuli seed
200	290	355
250	352	412

Source: Group discussions with EFU and ESE seed farmers

Table 18. Farmers price expectations from various Kabuli varieties, given local prices for Desi grain in the local market in Debre Zeit, Ethiopia

Price of Desi grain in local markets (Birr/qt)	Prices acceptable to farmers (Birr/qt)			
	Kabuli grain		Kabuli seed	
	Shaso/Arerti	Flip	Shaso/Arerti	Flip
200	300	350	350	400
250	350	400	400	450

Source: Group discussions with EFU and ESE seed farmers

Table 19. Actual price fluctuations reported by farmers for Desi and Kabuli grain at harvest, 6 months after harvest and at planting in August Debre Zeit, Ethiopia

Period	Grain price in local markets (Birr/qt)	
	Desi	Kabuli
At chickpea harvest	195	239
Six months after harvest	224	282
At chickpea planting	238	327

Source: Group discussions with EFU Kabuli grain producers

Table 20. The most important Kabuli chickpea seed production and marketing problems reported some six seed producing PAs in Debre Zeit, Ethiopia

UDE PA:ESE	UDE: EFU	UDE: EFE	GANDA GORBA: EFU	HIDI:EFU	Godino: EFU
<ol style="list-style-type: none"> 1. Poor market 2. Theft in the field 3. Cutworms and bollworms 	<ol style="list-style-type: none"> 1. Poor market 2. Pest and diseases 3. Human theft 	<ol style="list-style-type: none"> 1. Poor market 2. Pests: bollworms and cutworms 3. Theft in field 	<ol style="list-style-type: none"> 1. Poor market 2. Pests (bollworms and cutworms) 4. Theft in field 	<ol style="list-style-type: none"> 1. Poor market 2. Bollworms 3. Wilt 4. Theft 5. Cutworms 	<ol style="list-style-type: none"> 1. Low demand 2. Bollworms 3. Wilt 4. Theft

Source: informal group discussions with EFU and ESE seed producers

Table 21. Priority order of crops traded by small, medium and large traders in Debre Zeit, Ethiopia

Priority order of grains traded		
Small traders	Medium traders	Large traders
<ol style="list-style-type: none"> 1. Teff 2. Wheat 3. Chickpea 4. Grass pea 5. Lentil 6. Beans 7. Faba beans 8. Maize 	<ol style="list-style-type: none"> 1. Teff 2. Wheat 3. Chickpea 4. Beans 5. Grass pea 6. Lentil 7. Faba bean 	<ol style="list-style-type: none"> 1. Teff 2. Chickpea 3. Wheat 4. Lentil 5. Grasspea 6. Beans 7. Barley

Source: Interviews with traders in Debre Zeit

Table 22. Sources of different Kabuli grain types and average purchase prices by traders in Debre Zeit, Ethiopia

Source of grain/ Type of chickpea	Average price of grain (Birr/qt)		
	Small traders	Medium traders	Large traders
Farmer:			
1. Shasho	248	250	301
2. Arerti	223	215	216
3. Flip	275	253	312
4. Desi	188	183	216
Mean	234	225	261
Assemblers:			
Shasho	-	-	292
Arerti	-	-	245
Flip	-	-	275
Desi	-	-	225
Mean			259
Other traders			
1. Shasho	-	230	291
2. Arerti	-	220	270
3. Flip	-	270	308
4. Desi	-	180	209
		225	270

Source: Interviews with traders in Debre Zeit

Table 23. Chickpea grain prices at harvest, 6 months after harvest and at planting time in Debre Zeit, Ethiopia

Transaction/variety	Average prices in Birr/qt during different periods of the year		
	At harvest	Six months after harvest	At planting time
Purchase:			
1. Arerti	227	263	269
2. Shasho	253	277	285
3. Flip	269	293	310
4. Desi	176	192	211
Mean	231	256	269
Sale:			
Arerti	263	298	312
Shasho	283	302	308
Flip	291	308	317
Desi	180	198	203
Mean	254	277	285

Source: Interviews with traders in Debre Zeit

Table 24. Proposed Kabuli seed prices for use: price of grain at planting time compared with farmers' expectations in Debre Zeit, Ethiopia

Type chickpea	Producer price of grain at planting time (Birr/qt)	Farmers expectations (Birr/qt)
Desi	211	212
Arerti	269	272
Shasho	285	304
Flip	310	323

Source: Interviews with traders in Debre Zeit

Figures

Figure 1. Production and marketing model employed by ESE for Shaso and Areti Kabuli chickpea in Ada, Akaki, Gimbicho, Lume, Dawo and Mbeche of Ethiopia in 2003, 2004 and 2005

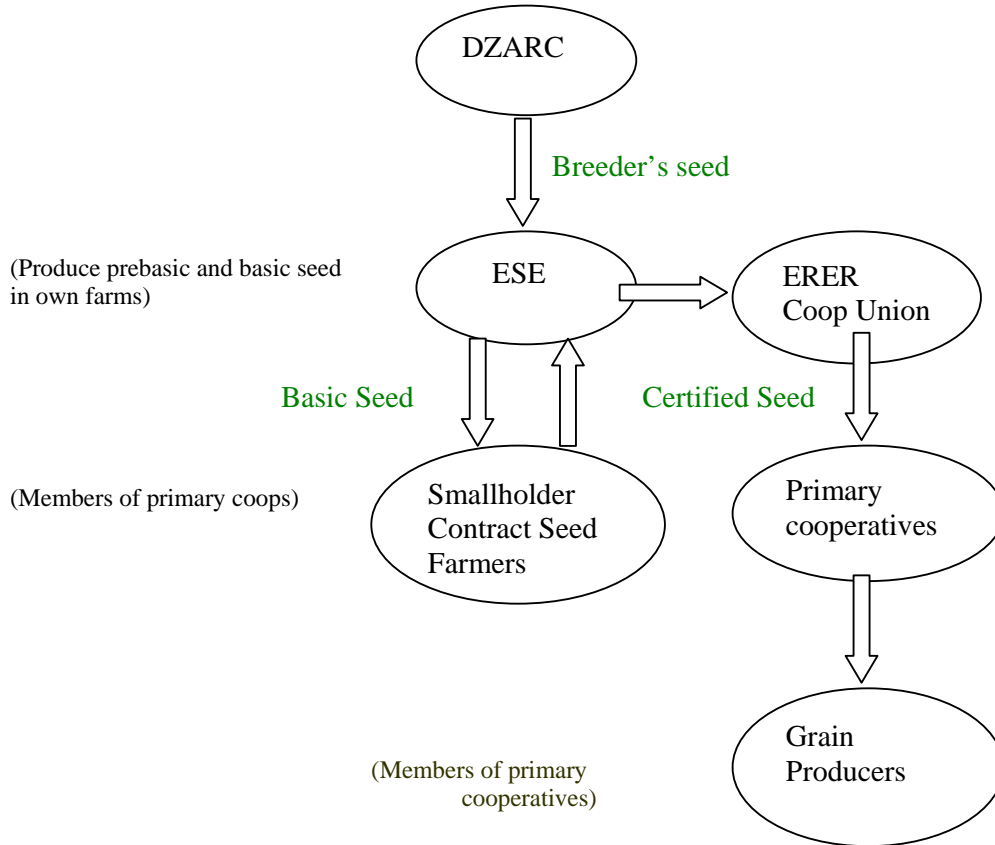


Figure 2. Seed production model used by EFU to produce and market Kabuli seed in Ada, Akaki and Gimbichu Districts of Ethiopia.

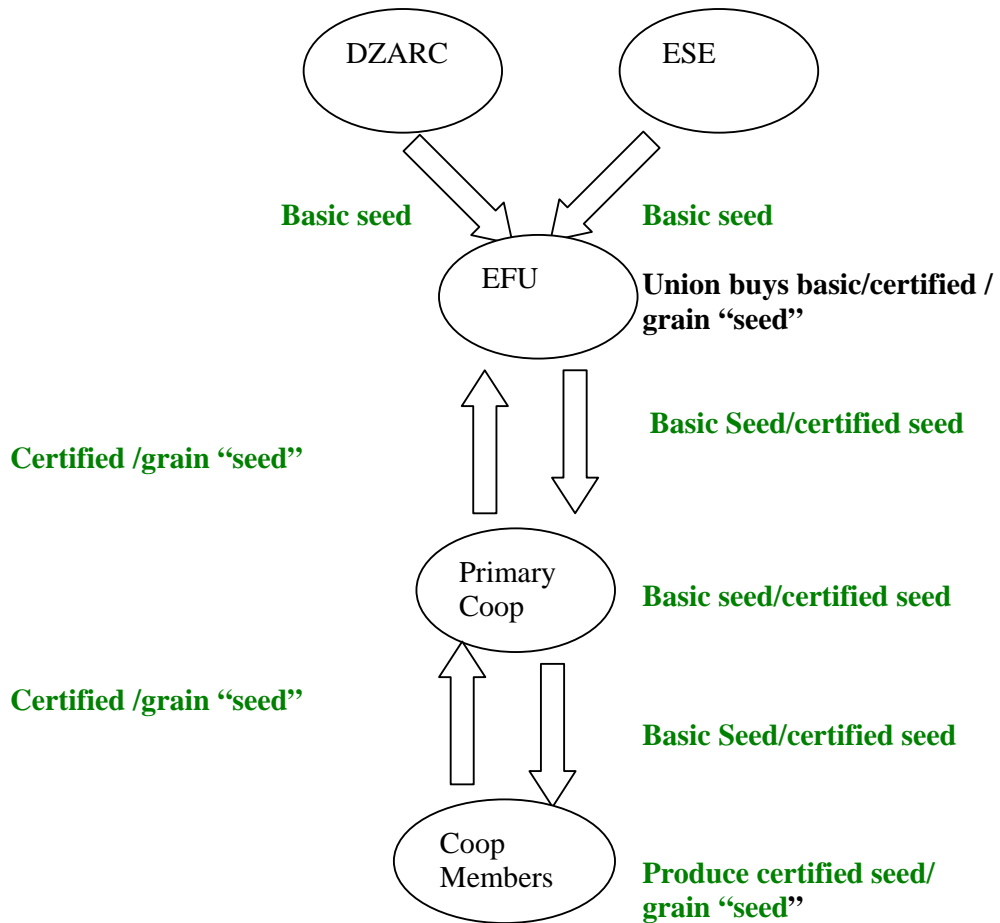
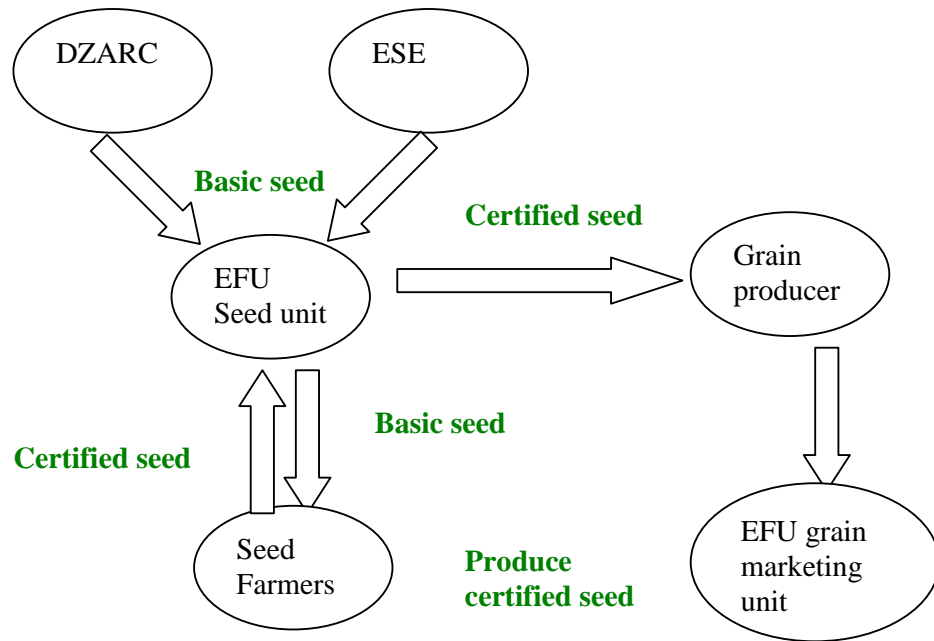


Figure 3. Recommended Kabuli seed production model for EFU, Debre Zeit, Ethiopia



Appendix 1: People or organizations consulted

Although the people and the organizations below were consulted, any omission or information in this report remains the responsibility of the authors.

Ethiopian Seed Enterprises (ESE)

1. Mr. Yonas Sahlu, Manager Seed promotion and Extension –Addis Headquarters
2. Ato Worku Kassa- Manager, Arsi Basic Seed Production and Processing Center in Oromia Region, Arsi zone, Tyo Woreda based in Asela town
3. Eshetu Sisory- Head of production and extension, ABSPPC
4. Adugna Tadessa –Agronomist, ABSPPC
5. Gemechu Degetie – Extension Expert, ABSPPC

IPMS field office at Debre Zeit

Nigatu Alemayehu, Research and Development Officer, IPMS-ILRI, DZ
Gerba Leta, Research and Development Assistant, IPMS-ILRI, DZ

MoA&RD at Woreda in Ada

Dechassa Aboye, Head of Agriculture and Rural Development for Woreda
Bekele Soboka, Crop Production and Protection Extension Team Leader

ERER Farmers Union (EFU) in Debre Zeit

Makonnen Haile – Deputy Manager, ERER Farmers Union

DZARC-EARO

1. Dr. Million Eshete, National Chickpea and Lentil research Coordinator, DZARC-EARO

Traders

1. Three small traders
2. Three medium traders
3. Three large traders

Seed producers/Farmers

Table: Six seed producing groups held focused discussions with in Ada

Peasants Association	Seed organization affiliate	Number of farmers in the group discussion	Sex	Mean Age in years
UDE Group 1-EFU	EFU	4	male	54
UDE Group 2- EFU	EFU	4	Male	45
UDE Group 3-ESE	ESE	4	Male	46
Ganda Gorba - EFU	EFU	4	male	49
Godino – EFU	EFU	3	male	42
Hidi – EFU	EFU	8	male	40

Appendix 2: Photographs



Photo 1: Hidi PA focus group discussion



Photo 2: Flip (left) and Arerti(right) seed plots next to each other in Hidi



Photo 3: Bollworm damage on Kabuli pods



Photo 4: Kabuli grain in EFU yard in DZ for export