

Seed Value Chain Analysis as a means for Sustainable Seed System: A case of farmers based seed production and marketing in Arsi Zone, Oromia Region



FAO-Crop Diversification and Marketing Development Project

Asella, Ethiopia

Seed Value Chain Analysis as a means for Sustainable Seed System: A
case of farmers based seed production and marketing in Arsi Zone,
Oromia Region

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Cover photo: wheat pre- basic seed multiplied on farmer's field, by Olani Nikus

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Abbreviations

ABRDP	Arsi Bale Rural Development Project
ADLI	Agricultural Development Led Industrialization
AISE	Agricultural Input Supply Enterprise
ARDO	Agriculture and Rural Development Office
CADU	Chilalo Agricultural Development Unit
CDMDP	Crop Diversification and Marketing Development Project
CPO	Cooperative Promotion Office
EIAR	Ethiopian Institute of Agricultural Research
ESE	Ethiopian Seed Enterprise
FAO	Food and Agriculture Organization of the United Nations
FBSPMS	Farmer Based Seed Production and Marketing Schemes
KARC	Kulumsa Agricultural Research Center
MDC	Market Development Component
MoARD	Ministry of Agriculture and Rural Development
NGO	Non-Governmental Organization
NSIA	National Seed Industry Agency
PASDEP	Plan for Accelerated and Sustainable Development to End Poverty
OBoARD	Oromia Bureau of Agriculture and Rural Development
OCB	Oromia Cooperative Bank
OSE	Oromia Seed Enterprise
UAAIE	Upper Awash Agro-Industry Enterprise

Executive Summary

The Crop Diversification and Marketing Development Project (CDMDP) is being implemented by FAO in collaboration with Oromiya Agricultural and Rural Development Bureau. Its objective is promotion of economic growth in rural areas through strengthening commercialization of small scale farmers in areas with recognized market potential, in support to the Government's program of Plan for Accelerated and Sustainable Development to End Poverty (PASDEP).

Within the projects market development component, farmer based seed production and marketing was given emphasis due to its market potential and forward linkages. The project has been involved in assisting farmers in seed production for the last four years. The intervention was successful, but still there are opportunities for increased efficiency and establishment of sustainable farmer based seed system.

This value chain analysis was conducted with emphasis on wheat and barley to uncover constraints in the system which requires intervention for improved seed system. The analysis is based on a case study on wheat and barley in the project area, specifically in *woredas* where farmers' based seed production and marketing is being conducted. This covers 6 out of the 24 *woredas* of Arsi zone.

The analysis has considered the actors and activities involved in farmer based seed production, the constraints and required actions for sustainable farmer based seed production and marketing.

Various entities are involved in farmer based seed production and marketing system. These include different government institutions, research institute, seed enterprises, farmers unions, cooperatives, seed producing farmers and grain producers. In the process input and products flow through the system adding value. Money also changes hands. There are many activities and actors in between. Farmers are also scattered, with its own impact on efficiency of the system.

Three institutions are directly involved in farmer based seed production in the study area. These are Oromia Bureau of Agriculture and Rural Development (OBoARD), Ethiopian Seed Enterprise (ESE) Asella branch and FAO-CDMDP. All the three institutions provide input, training and supervision. The recently established Oromia seed enterprise is also involved in the system. Farmers are obliged to sell the produce to Unions and the Seed Enterprise (based on agreed terms of exchange) for cleaning, packaging and distribution to other farmers as certified seed. But collection is low, less than 20% due to the incentive system (pricing) upon which the contractual agreement is made with farmers for delivery.

Economically wheat and barley seed production is rewarding to farmers. A study conducted by the project on profitability of seed production also indicates an incremental profit of 37 and 34% for barley and wheat, respectively compared to grain production.

But many constraints are involved despite its viability to farmers. The major constraints include shortage of inputs (especially basic seed), poor incentive system, inadequate

facilities and lack of subsectoral organization. Accordingly it is recommended that seed producers get organized into cooperatives and union at zonal level. Further it is recommended that mechanisms put in place for adequate input supply, adequate facilities and the incentive system (price) redesigned based on market forces.

Chapter 1 General Introduction

1.1 Background

The Government has put in place an "Agricultural Development Led Industrialization" (ADLI) strategy which aims to use the agriculture sector as the base for the country's overall development. The strategy core center is the enhancement of the productivity of small scale farmers and food security improvement both in the rural and urban areas. The government also introduced specific services and provided technical and institutional support to farmers, in its drive to increase food production through intensive cultivation. These included fertilizer supply and distribution, improved seed supply and distribution, development of small-scale irrigation, conservation of natural resources and environment, agricultural research and extension work as well as marketing and price policy.

The effectiveness of such services and research generated inputs are governed by the strength and efficiency of support services such as extension, credit and input supply, including the supply of improved seed. As it embodies the plant genetic potential, improved seed is base for increased production and productivity while also addressing the country's food security and poverty reduction challenges.

Despite the importance of improved seed for improving productivity of small-scale farmers, access to this invaluable technology can be constrained by many factors, including an underdeveloped seed industry. Currently, government and private seed companies in Ethiopia typically supply no more than 10% of seed of most food crops. Such institutions typically produce basic and certified seed in centralized facilities.

Seed production through small-scale farmers was considered taking into consideration the importance of the informal seed sector, which provides major volumes of the national requirement with farm-saved seed. The former National Seed Industry Agency (NSIA) through the Seed Systems Project had implemented Farmer Based Seed Production and Marketing Schemes (FBSPMS) for some selected crops in several regions of the country with the aim improve farmers' skills in seed production, create awareness about the importance of seed as a major input into improved production and productivity and increase the capacity of Ethiopian Seed Enterprise (ESE) in seed production in order to meet the overall demand in the country. In so doing it has encouraged variety diffusion within communities through farmer-to-farmer seed exchange.

Arsi zone is one of the areas where the scheme had been implemented through the seed system project. Following the closure of the project under NISA, the Oromia Bureau of Agriculture and Rural Development (OBoARD) and the ESE- Asella branch has been undertaking farmer based seed production in Arsi zone through contractual agreements. OBoARD is working in six (6) *woredas* and the ESE in two (2) *woredas* within the project area. The Crop Diversification and Marketing Development Project (CDMDP) of the Food and Agriculture Organization (FAO) of the United Nations is also working on farmer based seed production and marketing in six *woredas* of the zone over the last four years. Its activities include financing inputs, extension and organizing seed producer groups. Based on prior assessment by the project on wheat and barley, farmer based seed production is technically feasible and financial viable. But the system is fragile due to different factors involvement and loose linkage exists amongst.

Various entities are involved in the farmer based seed production and marketing system in Arsi zone. These include government institutions, public seed enterprises, farmers unions, cooperatives, seed producing farmers and grain producers. In the process input and products flow through the system adding value. Money also changes hands. There are many activities and actors in between. Farmers are also scattered, with its own impact on efficiency of the system.

The Project FAO-CDMDP is one of the actors involved in the seed system in the zone. The FAO - CDMDP, under implementation in Arsi zone of Oromia Region, has a broad objective of promoting economic growth in rural areas of the Arsi Zone through strengthening commercialization of small farms in areas with recognized market potentials. The project aims at tapping new market opportunities by providing technologies with potentials to increase production, productivity as well as quality of agricultural products so as to increase income, minimize price volatility and promote sustainable use of natural resources. One of the three major components of the project CDMDP is market development component (MDC).

Considering the significance of sustained seed security for the development of the agriculture sector of the country, FAO under MDC is working to strengthen the seed supply system through the establishment of farmer's seed producers groups that would further evolve to cooperatives or unions. One major effort of the MDC is to undertake assessments of chosen system so as to better target relevant support. The strategy for doing so is to increase performance, competitiveness and growth of the seed group farmers businesses, which is expected to contribute to the growth and improvement in economic and social conditions. CMDP intends to addresses the issue of input supply and market imperfections for the seed sector by identifying and working with input suppliers and service providers who are currently offering or have potential to offer commercial services to the seed businesses. CDMDP role is to assist the farmers in the seed sector and work with the service providers in order that farmers based seed production become sustainable and economically viable.

This document reports on the value chain study conducted on conditions of farmer seed producer groups or cooperatives functioning in Arsi zone of Oromia region. The document is divided in to six parts. Following this introduction, the study area, objectives and methodologies are presented in this first section. Section two introduces the seed system and opportunities available in Arsi. Section three is value chain analysis with details on activities and actors involved, the concept of value chain is also elaborated in this section. This is followed by SWOT analysis and conclusions in section 4 and 5, respectively

1.2 Overview of Study Area

Arsi zone: Arsi zone, located in south eastern Ethiopia, has an area of 20,737.24 square kilometres and is divided into 24 *woredas*. Based on the 2007 population and housing census report, the population of the zone currently is estimated to be 2,850,493 with 88% being living in rural areas (FDRE-PCC, 2008). The zone is divided into four agroclimatic zones; lowlands (29%), mid altitudes (27%), highland (40%) and frost (4%). The average temperature ranges 10-25 °C. Its altitude ranges from 500 to 4245masl. The zone receives rainfall twice per year (*belg* and *meher*) and on average receives from 800-1200mm. The land use pattern is 43.6 % crop land, 17 % grazing land, 10.3 % forest and bush land and the rest 28.65 % for others (Arsi zone ARDO).

The zone produces a number of different varieties of agricultural crops ranging from cereals to pulses, vegetables, fruit, oilseeds and spices. Crop production by area is predominantly cereals followed by pulses, vegetables, oilseeds and fruit crops. The zone is referred as surplus grain producing areas in the country.

Studies and discussions with various key informants have shown that the zone agricultural sector has both great potential and significant challenges. Potentials or opportunities are good agro-ecology and flat terrains which supports mechanization, existence of different institutions (ESE, Ethiopian Institute of Agricultural Research- EIAR, etc) and development projects implemented in the past such as Chilalo Agricultural Development Unit (CADU)-the first integrated rural development project in the country which began in 1967 and continued up to 1990 in different forms and later followed by another rural development project-Aris Bale Rural Development Project (ABRDP), an Italian cooperation which mainly deals with infrastructure development and input supply.

On the other hand the agriculture sector is generally facing multifarious problems such as lack of adequate supply of quality inputs, inadequate farming knowledge, rudimentary farming practices, lack of farm machinery and tools, marketing, poor local capacity to provide necessary services to improve farmers efficiency and growth, poor linkage among the institutes that support the sector with adaptive research and extension, poor feeder road system for transporting raw materials and agricultural products.

Description of the seed project woredas: The project is working in eight *woredas* of Arsi zone (Figure 1.), out of which the seed production activities is underway in six *woredas* namely Tiyo, Hetosa, Munessa, Digalu Tijo, Lemu Bilbilo and Honkolo Wabe *woredas* (the newly separated woreda from L/Bilbilo). The other two project *woredas* are Dodota and Zeway Dugda.

Population: According to the 2007 population and housing census report, the total population of the project area is currently estimated to be 890,034 out of which 791,884 (88.97 %) live in rural areas (FDRE-PCC, 2008). There are 171 rural and 21 urban *kebeles* (excluding Asella).

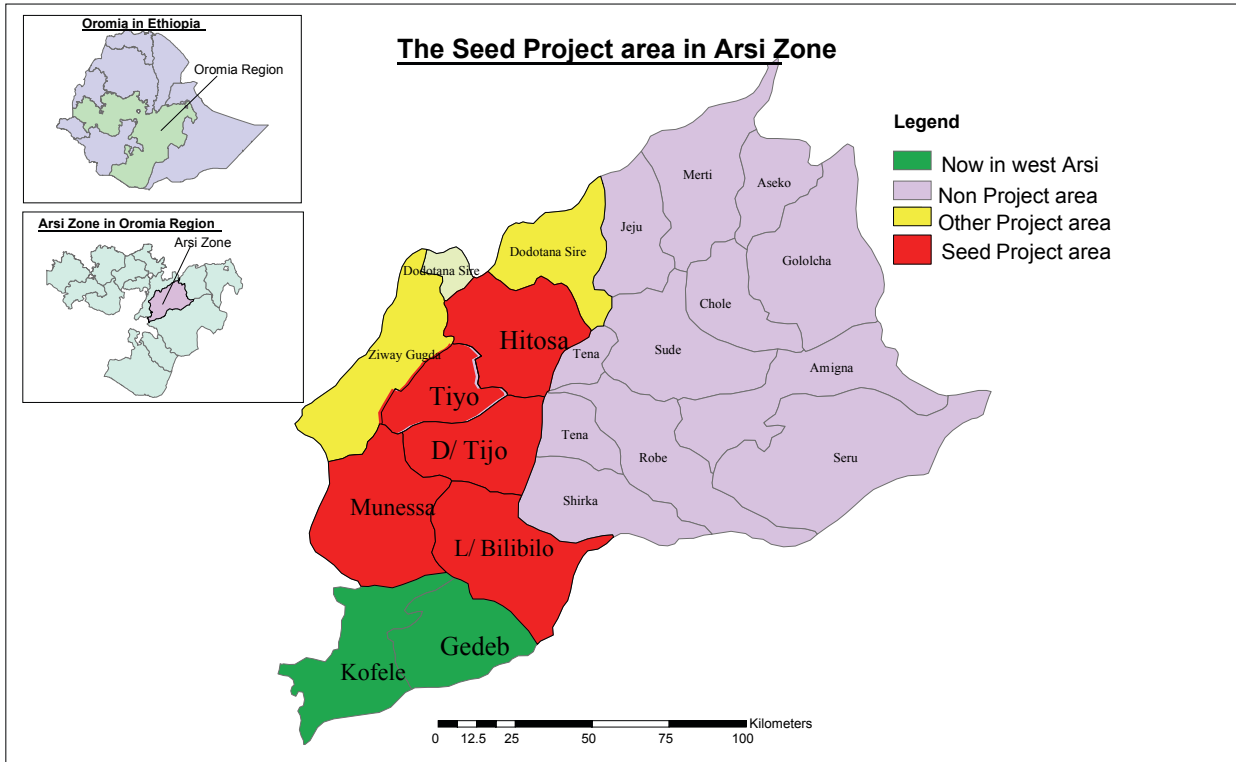


Figure 1 Map of Arsi showing the project seed intervention target *woredas*.

Land use pattern: The total project area is estimated at 636,731 hectares. Out of this crop area, grazing and forest accounts for 49.6%, 10% and 9.6%, respectively. Bushes and shrubs which are seasonal browsing area occupy 6.7% of the total. The other 24% is occupied with swamps and buildings or is wholly barren, thus have very low agricultural value (Table 1).

Table 1. Land use pattern

5 <i>Woreda</i>	Land use pattern (ha)						Total
	Crop	Grazing	Forest	Bush and shrubs	Barren	Others	
Tiyo	25,060	9697	3959	9479	10,828	5,977	65,000
Hetosa	35,000	8,721	4,044	17,016	-	2240	67,021
Dodota	21266	1832	1300	6870	-	13,292	44,560
Zeway Dugda	31,687	1,179	1,800	1,336	3,000	86,098	125,100
Munesa	62,800	21,059	33,074	1608	779	2410	121,730
Digalu Tijo	43,873	15,054	11,122	-	-	22,651	92,700
Limu Bilbilo	70,154	6,746	3839	262	99	300	81,400
H/Wabe	25692	784	1761	5883	1961	3139	39220
Total	315,532	65,072	60,899	42,454	16,667	136,107	636,731

Source: *Woreda* ARDO, 2007.

Per capita holding for crop and grazing area is estimated at 2.8 and 0.6 hectares respectively, which is quite large given the growing number of population, and thus the data should be used with precaution as it seems that area cultivated and crop produced are overestimated.

Economic Activity: As typical Ethiopian smallholder agriculture, the major economic activity is mixed farming, where crop production and livestock husbandry are practiced side by side. Crop apart from being major source of livelihood to farmers, provides feed to

livestock. Livestock provide traction power for land preparation and manure for crop enterprises, and is also source of cash income for input purchase and source of family diet.

Mixed farming is ranked as the most important activity in all *woredas*. Crop production is the major economic activity followed by livestock. Petty trade and handicrafts are less important in all *woredas*. This is in line with the previous study report of Zewudie Beshaw (2004). They are the last resort after agriculture, but are important in terms of mitigating risks associated with household food security. The relative size of households involved in each activity is not certainly known, due to lack of information. But it can be inferred that mixed farming is the most important where the majority of population is involved, as livestock is required for crop production itself.

1.3. Objectives and Methodology

Objective: The overall objectives of this analysis was to provide information on the farmer based seed production and marketing system and uncover constraints which require intervention for improved seed system by so doing contribute to the improvement of the economic and financial performance of the sector. The specific objectives were:

- To characterize the system
- To assess the present market condition of the subsector – market size, key players, gaps, pricing, and seed distribution networks
- To develop value chain map for the seed sub sector and conduct SWOT analysis
- To identify constraints which affect the efficiency of the chain and propose a set of recommendations for the participants of the sector and public institutions

Methodology of the study: For the value chain study a combination of field survey for seed cost benefit analysis and seed utilization, interviews with key persons in each actors and literature review were conducted. The primary data for wheat and barley seed production cost benefit analysis and seed utilization was collected in 2007 from farmers participating in seed production in the six *woredas*. A total of 108 seed producing farmers were selected and were interviewed using a pre prepared checklists of questions to query farmers on their seed production levels, costs involved in each activities, seed supply and other relevant issues.

Also, four focus group discussions were conducted with 15 to 20 participants in selected *woredas* for in-depth understanding on selected key issues of input supply, production, marketing, processing, as well as constraints/opportunities and potential interventions to remove the constraints and take advantage of the opportunities.

To understand the true dynamics of the seed system, information were also gathered through key informants' interviews (government, research institutes, unions, primary cooperatives) in the target areas. The key informants provided a variety of information ranging from general socio-economic to specifics related to the wheat seed sector. Attempt was made to collect relevant documentation related to the subsector and the target areas.

Chapter 2 Seed Supply Systems and Viability of Seed Production in Arsi

2.1 Seed Supply Systems in Arsi

The seed supply in the Arsi zone or the country in general comes from different sources including from commercial sector (the seed enterprise), farmers based seed production on contractual basis or on-farm saved from the farmers. In the earlier times most of the papers on the seed supply system focuses on the organized seed sector (enterprise) and accordingly it has been attempted to define the national seed system from that perspectives. But recently, the concept have been developed and expanded to include the other component-the 'informal' seed sector. According to Van Amstel *et al.* (1996) as cited by Zewudie Beshaw 2004, seed system is defined as the sum of physical, organizational and institutional components, their actions and interactions that determine seed supply and use, in quantitative and qualitative terms. Accordingly, the recognized seed supply systems fall into two categories – the formal and informal system. However it is impossible to put precise border line between the two systems. Even these days a number of scholars argue that there is semiformal seed system (like the farmers based seed production and marketing) which lies between the two systems. Be that as it may here the formal system and the informal system categorizing farmers based seed production in to the later system for simplicity is discussed very briefly as follows.

Formal seed supply

The formal seed supply system generally consists of institutional and organizational arrangements comprising institutions, enterprises and different organizations involved in the supply of improved varieties from the research system to the communities at grass root level (farmers). The actors include research institution like Ethiopian Institute of Agricultural Research (EIAR)- Kulumsa Agricultural Research Center (KARC), public seed enterprise (ESE-Asella branch), and service providers (like OBoARD, Unions, Asella Seed laboratory). The recently established Regional Seed Enterprise (Oromia Seed Enterprise- OSE) is also in the system since 2009.

The Ethiopian Institute of Agricultural Research is responsible for breeding and importing improved varieties of crops and multiplication of breeder seeds to supply to ESE so that enough certified seed is produced and supplied to farmers. The Institute runs breeding activities in number of main research centres and sub-centres on cereal crops, pulse, oilseeds and other crops. Kulumsa Agricultural Research Center (KARC) is one of the main centers more important for Arsi zone. KARC is responsible for breeding, maintaining and providing breeder and basic seed for different crops and crop varieties to ESE or OSE. The center also produces basic seed of different crops on its farm on small scale and supply through the Unions and BoARD to farmers in Arsi in order to contribute to the alleviation of the critical seed shortage prevailing in the zone.

The Ethiopian Seed Enterprise (ESE), established in 1978 by the then called Ethiopian Seed Corporation, is a public enterprise engaged in the production, processing and distribution of quality seed to farmers. The enterprise has under gone restructuring in 2002 and become under the supervision of Agricultural Inputs and Marketing Department of the Ministry of Agriculture and Rural Development in order to enable the enterprise support the rural development policies and strategy in place in 2001. To date ESE is the main producer and supplier in the formal seed sector. In the country, the enterprise is working on 24 different crops and 109 crop varieties, though wheat and maize takes lions share in its seed production.

The enterprise produces seeds through its different branches at different sites in the country and on state farms and on small scale farmers on contractual basis. One of the branches is in Arsi zone- ESE-Asella branch. The Asella branch operates within the project area and is also supplier of seed for the project's seed production component. The branch produces seed under two modalities. The first is through its own farm (which is 400 hectare) at Gonde-Itaya basic seed farms and on state farms and Upper Awash Agro-Industry Enterprise (UAAIE) farms. The two state farms are the Lole state farms in Munessa and Adele state farms in Amigna *woredas*. In these farms the branch produces mainly wheat (certified seeds) on more than 2528 hectares which varies from year to year due to rotation purposes. While, on the Upper Awash Agro-Industry Enterprise farms the branch produces hybrid maize seed (producing on 1205 hectares). The other modality is through contracting farmers for production of specific seed types. Accordingly, the enterprise multiplies the first two classes of seeds (pre-basic and basic seeds) on its own seed farms and finally the commercial seeds almost exclusively on contractual basis on the state farms and individual farmers' fields. The seed so produced is assembled, cleaned and packed by ESE and distributed to farmers through farmers Unions and Cooperatives. There are no systems for direct sale of seeds to farmers due to the inadequacy in amount of seed produced and supplied.

In view of the changing situations and development approaches in the country, the ESE has restructured itself from previous supply-oriented parastatal to a market-oriented commercial enterprise. Accordingly it is producing seeds in contracts with farmers and also expanding its farms in different parts of the country in order to increase the amount of seed produced and supplied to farmers. In the zone no other private seed producing firms exists.

In spite of reasonable years of experience of seed programme in the country, the formal seed industry is reported to cater for less than 10% of the seed needs of the farmers for the dominant staple crops. In Arsi zone, the improved seed covers only 6.2% of the total cultivated land. The most important reason given for this is the fact that seed programme have concentrated on major food crops which are considered national priorities in terms of foreign exchange earning and selected staple food requirements. Also the limited capacity and farm area and others has contributed to the limited production and supply of seeds to farmers.

Owing to these, the formal sector has failed to satisfy the seed demand of the vast majority of the small holder farmers in the country in general and in Arsi in particular. But still remains the main public sector seed producer and supplier in the country. Nationwide the enterprise has sold and distributed yearly 149, 636 qt of seeds of major crops averaged over the years (2000-2007) which depicts its limited capacity (Figure 2). Even from the supplied amount, few crops/ varieties took the lions share in terms of seed production and sales records (Figure 2). As indicated in Figure 3, wheat and maize are the dominant crops with high sales share in the enterprise seed production which might be due to their demand in large quantities (major food crops) and supports availed by different international research organizations that resulted in the development of number of high yielding varieties of these crops. Besides, the enterprise focuses on few varieties from the dominant crops. For instance on average one variety each from three crops took the major area of their respective crops under seed production over the four years period (Figure 4).

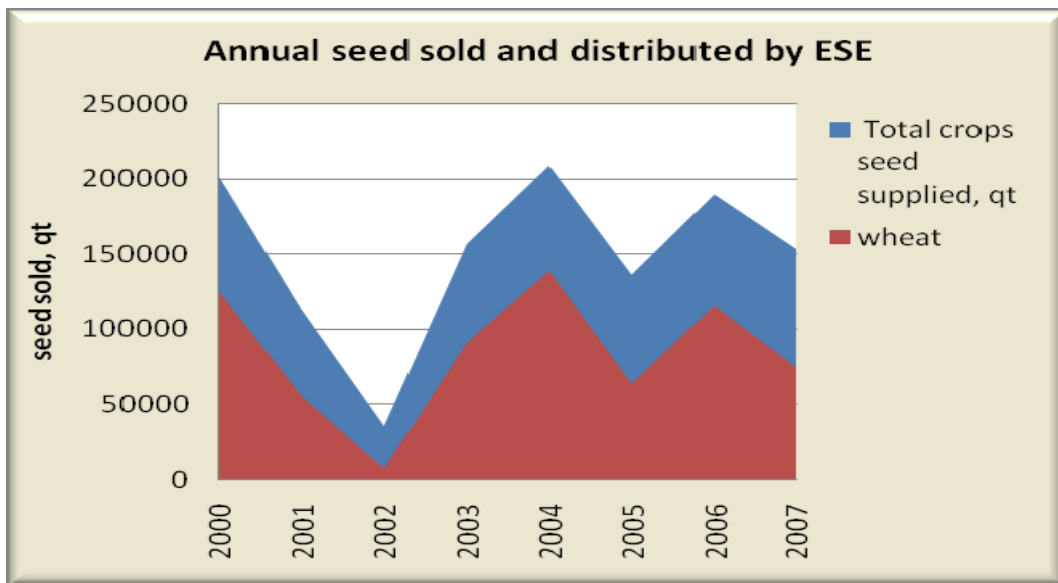


Figure 2. Yearly total seed sales and distribution record for major crops (cereals, oils and pulse crops) and wheat produced by ESE at national level over the years (2000-2007)
Source: ESE

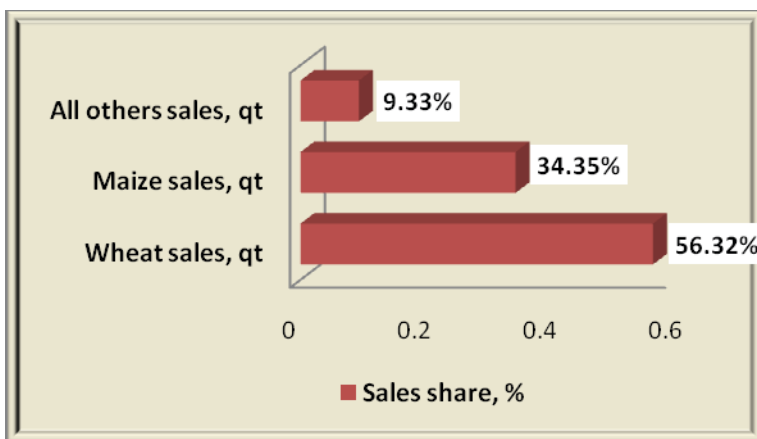


Figure 3. Sales share of the two major crops produced by ESE at national level in quintals over the years (2000-2007)
Source: ESE

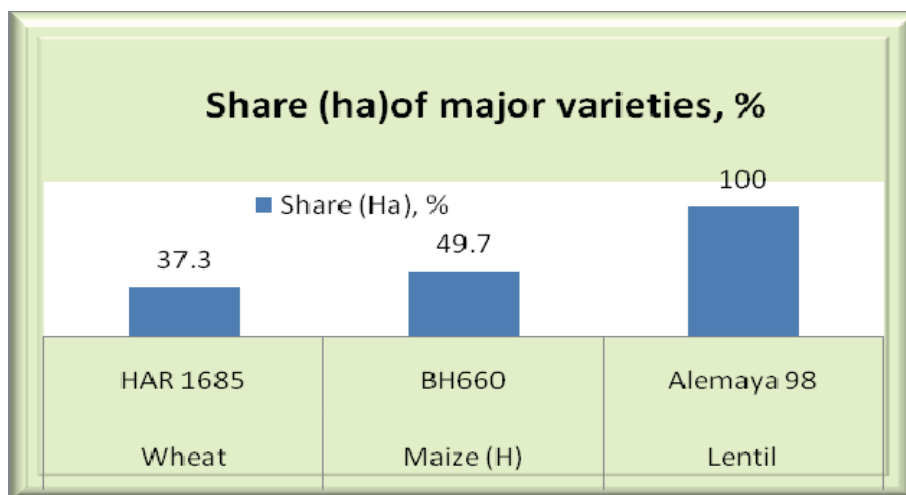


Figure 4. Share of major crop varieties produced by ESE at national level in terms of seed production area over the years (2003-2006)

Source: ESE

The service providers like OBoARD, Asella seed laboratory and the farmers Unions also plays key role in the formal seed sector. The ARDO are responsible for the over all effectiveness of the system by providing information on the farmers demand for the varieties, seed amount and for effective distribution of seed thereafter. The seed laboratory is responsible for quality control of seed produced for use in the Arsi zone and as well as neighbouring zones. So it helps in the certification and control of the seed quality produced and marketed. Farmers' cooperative unions are playing important role in the seed system as main distributors. These days cooperative unions are involved in seed and other input distribution to farmers (be it for their members or non-members). In the past, the seed distribution to farmers used to be through the *woreda* bureau of agriculture.

Informal seed supply

The informal seed supply system has its roots in the age-old tradition used by farmers to ensure the supply of more than 90% of the seeds (or seed requirement) of staple food crops required to meet food security. This comprises mainly of on-farm production, selection and saving of grain from harvested crop as seed for the next cropping season. It also includes farmers based seed production (very recently categorized by most scholars as semi formal) which are sold in the local markets in various forms to farmers or institutions (to Unions, NGOs etc) (Zewudies Beshaw *et al* 2008).

This system has been considered as credible alternative over years for many merits. The role of this system in germplasm conservation has also been documented (McGuire, 2005). Among the many qualities which made on-farm seed production a credible option for seed security of staple food crops is its broader national coverage; maintenance and sustenance of many crops, which are not patronized by the formal seed supply system but which are vital to the survival of the majority of the people, particularly the under privileged; reasonable and affordable seed costs to other farmers and availability of alternate arrangements for seed payment and closeness of seed supply sources to producers.

In Arsi zone, farmer based seed production which in most case is categorized as informal seed system began with a view to increase supply of quality seed in the absence of capable private sector for handling production and marketing effectively. FBSPMS was initially begun by the then National Seed Industry Agency (NSIA) and followed by ESE starting 2002. Parallel to

this the Regional Bureau of Agriculture and Rural Development also contracts farmers for producing quality seed after the cease of projects under NSIA. Under both scenarios farmers are obliged to submit 90 % and 80% of the seed produced within specified time at predetermined price of 15% for ESE and 30 and 40 Birr above grain price for basic and certified seed respectively in the case of OBoARD.

The Unions, Agriculture and Rural Development and Cooperatives Promotion Offices at *woreda* make a tripartite agreement to make farmer based seed production and marketing a success. Agriculture and Rural Development Offices provide training and conducts field inspection to attain optimum level of quality seed production. The Cooperative Promotion Office is responsible for strengthening the cooperatives and unions, so that input supply and marketing is conducted in an efficient manner.

The unions in collaboration with the primary cooperatives channel the inputs (basic seed and agro-chemicals) on time. Further they are responsible for marketing (assembly, transport, cleaning, packaging, storing and distribution) of seed.

The FAO-CDMDP is also working in the system in the last four years as part of service providers providing finance, extension and supervision for the farmers based seed production in the project target *woredas* of the zone. The project is involved in seed production for four consecutive years and will continue to expand over the project's coming years. The projects major activities in assisting farmers in seed production includes provision of basic seed, financing inputs, training and supervision, organizing seed groups and cooperatives with the vision of creating sustainable seed production and marketing system. Accordingly seed groups and cooperatives are being organized and subsequently will be followed by formation of seed cooperatives union, which shall provide required services for the primary cooperatives and also coordinate seed marketing.

2.2 Viability of Seed Production in Arsi

Feasibility of seed sector (market potential): The zone, including project area, is one of the few high potential areas for cereal crops production in the country owing to favourable agro-climatic condition and fertile well drained soil. The area under wheat and barley production is increasing from time to time in the country. The total area under wheat and barley was about 1.42 and 0.98 million ha, respectively, in 2007 *meher* season (CSA, 2008) which require significant amount of improved seeds. Significant proportion of the area is found in Arsi zone (124,896 ha for wheat and 106,112 ha for barley in *meher* season of same year), which is known for its wheat and barley production in the country.

Based on the sample survey result, wheat and barley are also major crops in the seed producing project *woredas*. Wheat accounts for 44 % of the total area cultivated, where as barley accounts for 24 percent; both together accounts for 68 % of area cultivated among seed producers. The rest 32 % is occupied by other cereals (teff, maize, and sorghum), pulses and oil crops (see Figure 5).

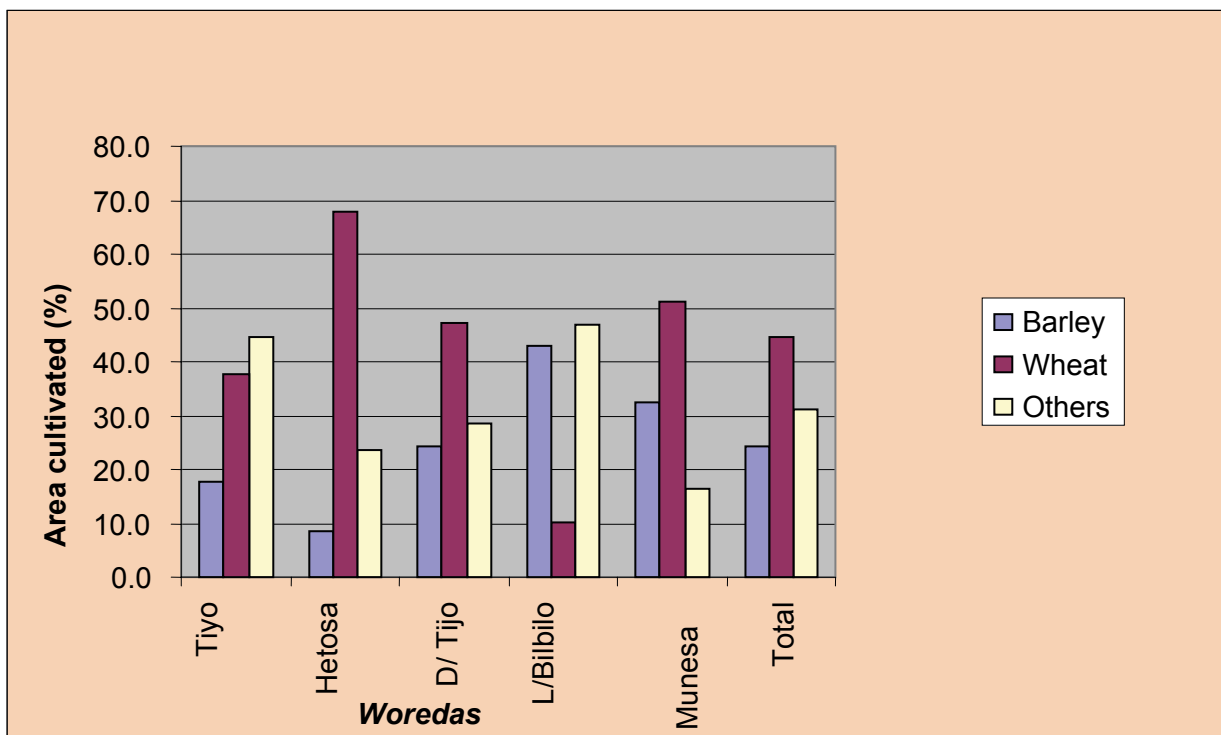


Figure 5. Share of wheat and barley in terms of area cultivated in the seed project *woredas*
Source: own survey, 2007

In terms of improved seed coverage, out of the total cultivated area (estimated 678,642 hectares) in Arsi zone in 2007 *meher* season (cereals, pulses and oil crops) only 6.2% was covered with improved seed, while the rest was covered with local seed (Figure 6). One can also see that from total area covered by cereals; only 7% was covered by improved seed, the rest 93% of the area was covered by local seed. From cereals, only 10.1 % and 6.7% of wheat and barley area respectively was covered with improved seeds in Arsi zone (Arsi zone ARDO, 2007).

Also similar improved seed coverage exists in the seed project *woredas* which had relatively better access to improved inputs and extension system. The project is working in eight *woredas* out of which six seed project *woredas* are designated as high potential cereal area, especially for wheat and barley. From the total area of 207,406 hectares covered by crop in 2007 *meher* season, only 12% was planted with improved seed, while the rest 88% was planted with local seed. Like wise, out of total area planted to cereals, 12% was covered with improved seeds; rest was covered with local seeds (Figure 7).

The above data depicts the availability of huge demand for improved seeds of wheat and barley, and other crops in Arsi zone including seed project *woredas* which could be exploited with increased supply and more strengthened farmers' seed production and extension system.

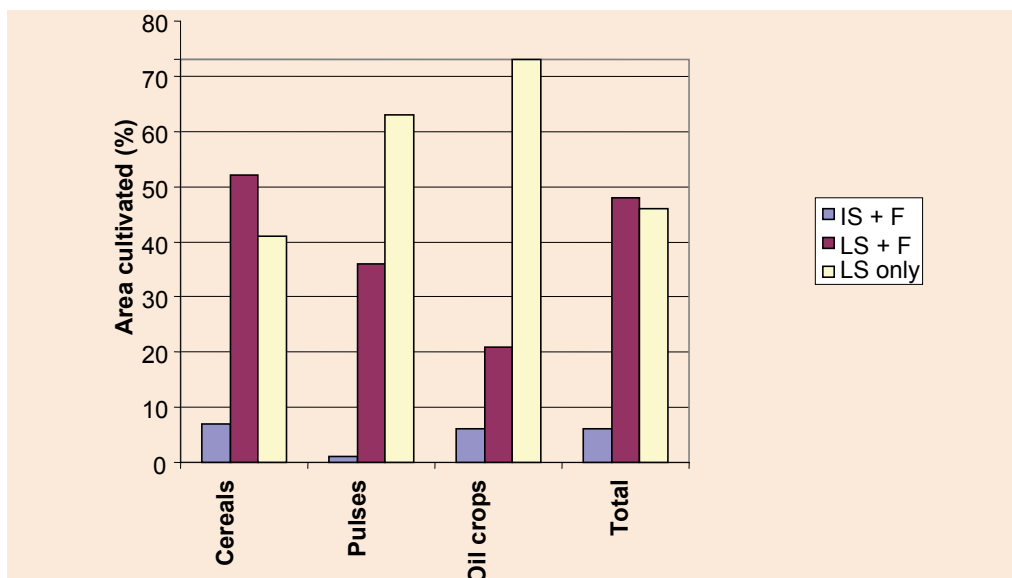


Figure 6. Improved seed and fertilizer utilization in Arsi zone, 2007

Note: IS = improved seed, F=fertilizer, LS= Local seed,

Source: Arsi Zone ARDO

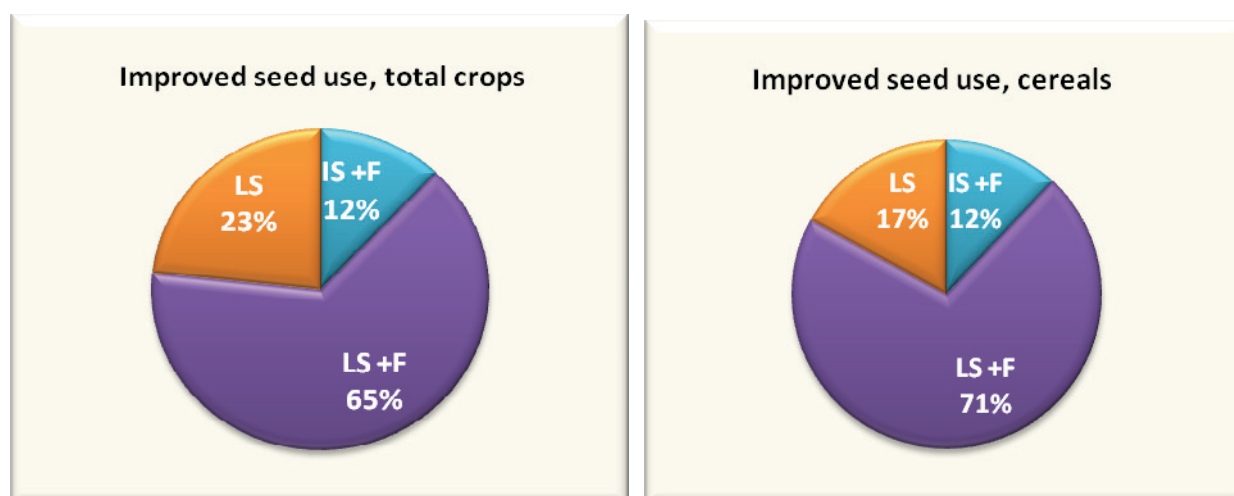


Figure 7. Improved seed and fertilizer utilization in the seed project woredas, 2007

IS= improved seed, LS= local seed, F=fertilizer

Source: Arsi Zone ARDO

Product profile: Wheat and barley comes in a number of varieties with recommended agronomic or cultivation practices. Each variety has its characteristics such as own shape, color, size, seed rate, duration of harvesting (maturity), spike character, tillering capacity, yield, disease resistance and recommendation domains. Among others farmers give special emphasis to the crop characteristics like grain yield, food quality, marketability, grain colour and grain size (Zewudie Beshaw, 2004). So far there are 35 improved bread wheat varieties

released by the EIAR and are currently available for production. However, only few of these are currently produced by the farmers. The ESE Asella branch is also producing limited number of bread wheat varieties. For instance in 2009, the branch produced seeds for only seven varieties of bread wheat (namely, Kubsa, Galama, Digalu, Simba, Pavon, Hawi, and Millenium). From the varieties known to farmers, only few of them are preferred and widely grown in the zone. Most of the varieties are less preferred by farmers. This is not surprising as they use the grain for marketing as well as for home consumption. Both wheat and barley are the most important cash crops for the small scale farmers in the area. Most of the wheat varieties available are susceptible to rust which reduces their yield potential. In Arsi zone, only few varieties are widely cultivated. Varieties like HAR 1685 (Kubsa) and HAR 604 (Galama) were broadly adapted and are superior in terms of grain yield, yield stability and seed characteristics. Variety HAR 3116 (Digalu) is also widely grown in some *woredas*. No varieties were released very recently which beats these varieties and preferred by farmers. So much emphasises should be given to resistant and high yielding varieties of wheat in the near future be it for mid- or high altitude areas.

Also there was some malt barley varieties released and are available for production in the zone. The farmers know all these varieties but the only problem is their seed supply in adequate amount. The most known varieties to farmers are Holker, HB1533, HB52, Beka and Miscal-21. Seeds of these are multiplied by ESE even if one or two varieties dominate the area under malt barley seed production. There are no new varieties of malt barley coming in from research centers and as a result farmers are obliged to produce old varieties that are as old as 30 years.

Enterprises in the seed sector (competitiveness): Only few entities are directly involved in seed production with very limited amount of seed produced compared to the demand. These include ESE, OSE and farmers seed producers (farmer based seed production and marketing). Others are involved in service provision, input distribution and marketing (see chapter 2). So there is no such competition between the entities involved currently and in the near future.

Sector profitability: The sub sector study attempted to show an accurate cost analysis in each activity related to operations and services in the 2007 season on the project farmers' based seed production. However, it was a challenge to collect all the relevant information because of lack of record keeping by the small farmers. The analysis was conducted on a sample of 108 farmers engaged in seed production in the project area. The analysis revealed that wheat and barley seed production is profitable. Based on the analysis the profit for wheat and barley is 10371 and 10667 birr per hectare, respectively (Table 2). Similarly the incremental income from seed compared to grain production is higher. The incremental income from engaging in seed as opposed to grain production is 60 % (3872 birr) and 66 % (4242 birr) per hectare for wheat and barley respectively (data not shown). The incremental income is both the result of yield increases due to improved quality seed and the higher price paid for seed.

Table 2: Cost benefit analysis for wheat and barley seed production (N=76 wheat and N=32 barley)

Description	Wheat		Barley	
	seed	grain	seed	grain
Total area (ha)	75	148.5	20	44.65
Total production (qt)	2430	3919	476	849
Yield (qt/ha)	32.4	26	23.8	19
Income: Birr/ha				
Seed/Grain	12,150	8189.8	12,233	7809
bi-products	734	711	1063	1155
Total	12,884	8900.8	13,296	8964
Production cost: Birr/ha				
Labour	541	514	932	885
Oxen power	531	504	801	761
Inputs	1106	940	896	806
Machinery	385	346		
Total Cost: Birr/ha	2563	2304	2629	2452
Profit: Birr/ha	10,321	6,597	10,667	6,512
B/C Ratio	5	3.9	5	3.65

Source: Farmer based seed production profitability analysis, CDMDP, 2008

Chapter 3 Seed Chain Analysis

3.1 Enabling Environment

Policy and Regulations: The seed policy and regulation provides support for farmer based seed production. This includes extension services, credit for inputs and sales assurance for seed whose quality is fulfilled.

Extension services: The Oromia Bureau of Agriculture and Rural Development provides extension services to farmers. This is conducted through training, demonstration and supervision by development agents (DAs) stationed at farmers level. In some places other institutions especially NGOs and multilateral organizations are also involved in extension services. The project CDMDP also provides extension, training and supervision to farmers for production of quality seed.

Finance and Credit: Agricultural inputs are provided through a line of credit guaranteed by the regional government. Usually there is down payment which varies from year to year. The unions also provide from their own sources. Farmers enter credit agreement for input through their cooperatives. Credit is repaid at the end of harvest time. Interest is 7.5% and there is a service charge of 3-5 and 10 Birr per quintal input provided to union and primary cooperative, respectively.

Price guarantee: Farmers producing seed are guaranteed for sale of seed they produce. There are two types of price observed for buying of seed. It was first 15% mark up above market price for grain prevailing at time of delivery which the ESE Asella branch is still using it. The other is a premium of 40 and 30 Birr per quintal for basic and C1 seed, respectively which the government is buying at through the unions. The reference price for both is grain price prevailing at an agreed market place within 15 kilometres radius from the production site.

Chain Coordination: The activity of farmer based seed production is coordinated by OBoARD and is represented by the Arsi zonal agricultural and rural development office. The zonal ARDO works in collaboration with the zonal Cooperative Promotion Office (CPO) and the Unions for input distribution, farmer supervision, credit availability and repayment, seed collection, processing and further distribution. While, ESE coordinates itself all the process for the seed produced by farmers through contractual basis.

Availability of farmers' organizations: Multipurpose cooperatives and unions are directly involved in distribution of inputs and provision of credit to farmers. Further they are also involved in collection, processing and distribution of seed produced on behalf of farmers. These cooperatives/unions are organized based on proclamations issued for cooperatives. The seed coops can get inputs through this till they get strengthened. There are cooperative offices at regional, zonal and *woreda* level responsible for organizing, training and guiding cooperatives and their members.

3.2. Seed Supply Chain

Various actors are involved in the core activities of seed supply, production, processing and marketing of the final product (seed) under the farmer based seed production scheme (Figure, 8, 9, 14). Also there are diverse institutions involved in the chain in service provision and facilitation including training, supervision, finance and credit. Different inputs like fertilizers and herbicides are required for seed production. These are also provided by different actors in the chain. Details of the actors and the activities associated are described in Figure 9.

Seed supply and production

Initial seed supply: Two institutions are involved in production and supply of basic seed. These are the EIAR and the ESE. Since 2009, the newly established Oromia Seed Enterprise (OSE) is also producing basic seed. Oromia Bureau of Agriculture and Rural Development, FAO and other NGOs act as facilitators in the process of supply to the farmers.

EIAR -KARC is primarily responsible for breeding and adaptation of improved varieties of crops. The institute has got many branches out of which the KARC is more important for Arsi zone. KARC is responsible for breeding, maintaining and providing breeder seed and basic seed for different crops and crop varieties to ESE or OSE. It also produces basic seed on its farm in the center but the capacity is very low.

The ESE, a public enterprise, is mandated for production, marketing and distribution of basic and C1 seed of improved crops varieties nation wide. The enterprise has many branches at different parts of the country. Farmers in Arsi/ project area are mainly provided from the Asella branch and in some cases from Robe and Kofale branches in neighboring zones. The Asella branch has 400 hectares of basic seed farm, seed stores and cleaning and packaging apparatus in its premises.

The enterprise also produces C1 seed (particularly for malt barley) on contractual basis. It provides seeds and extension advice/supervision to the contracting farmers. In this case the enterprise directly channels seeds to the farmers. Farmers are responsible for production on their own plot. At harvest, the seed enterprise buys at a price agreed in advance. The delivery date is determined in advance during signing of the contract.

Seed demand: Demand for seed (basic/certified) comes through *woreda* and zonal agriculture and rural development offices and specific projects run by multilaterals or NGOs and submitted to OBoARD and then to MoARD. The Ministry compiles the demand from the Regional States and make allocations accordingly. The allocation comes again through these channels.

The major actor in this scenario is the agriculture and rural development office. The FAO CDMD Project and the unions also plays role in this regard. In case of the seed production on individual farmers through OBoARD regular program, the *woreda* agriculture and rural development offices select capable farmers and make requests for basic and C1 seed. The request is passed to the zone ARDO and compiled and passed to OBoARD. Likewise for the seed producer cooperative/groups, their demand is collected through the respective *woreda* ARDO and Agribusiness promoters (ABP) of the project and then sent to the project offices

for compilation and submitted to OBoARD and OSE. Then that is passed to the MoARD which collects the entire request from the whole country and make allocations. Finally the ministry informs the Regional States (including OBoARD) as well as the ESE so that both zone and the ESE are informed of the amount to be distributed to the farmers. The zone then informs the unions.

Unions: The unions provide finance and are also responsible for distribution to the destined location through primary cooperatives or directly in case of the seed producer cooperatives. Seed producing farmers receive inputs from the primary cooperatives and produce seed (Figure 8).

Seed quality verification: Prior to marketing, *woreda* ARDO assess the quality of seed produced and ascertain its quality. Agronomists at *woreda* level check each farmer's field and crop for uniformity, weeds infestation and others. The important variables are purity, germination percentage and moisture content. The *woreda* tastes each farmers produce and pass the information to cooperatives and unions. The information includes name of farmer, quantity of seed produced and its quality. Also, the Asella seed laboratory makes tests at the unions' level to conform its sale and distribution to farmers.

Fertilizer and other agrochemicals supply: Fertilizer is provided through a line of credit by the unions to farmers. Fertilizer was directly imported by the unions through Government intermediation in the past but since 2009, the import becomes through AISE. The unions collect from Agricultural Input Supply Enterprise (AISE) at Djibouti port. It is provided to farmers on down payment, whose magnitude varies from year to year. The rate of interest is 7.5%. Further, the unions and cooperatives charge two Birr each per quintal of fertilizer provided.

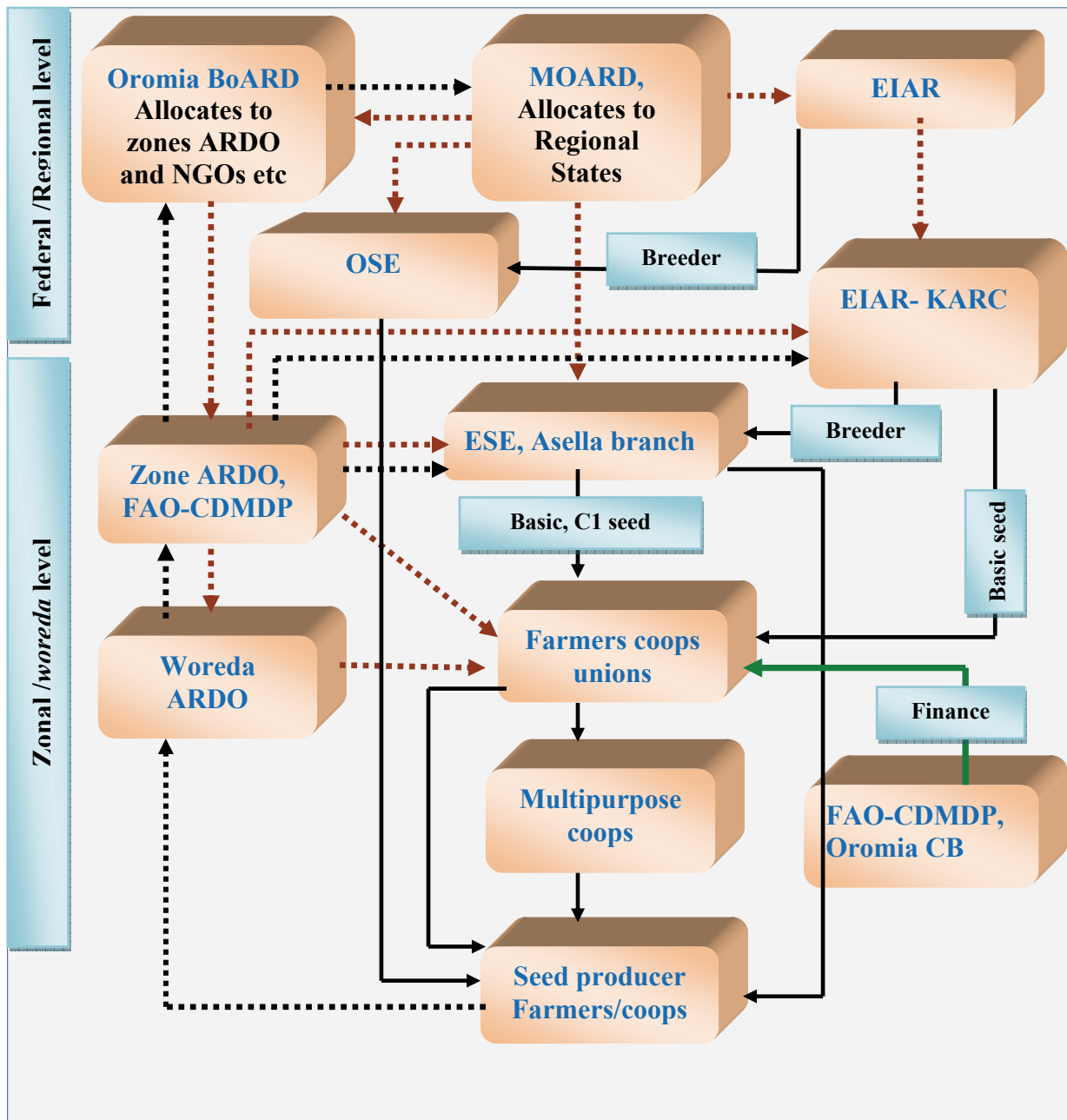


Figure 8: Basic and C1 seed supply chain map for farmers based seed production

.....➔ Seed demand ➔ Seed supply ➔ Allocations flow
 ➔ Finance

Source: Own sketching based on focus group discussion and validation

Farmers’ seed producer groups: The farmers based seed production is under way both by the zone ARDO on regular basis and by projects like FAO-CDMDP. In case of OBoARD, seed producing farmers receive basic and C1 seed provided by the ESE and ESIAR from the union through primary cooperatives and produce seed. As indicated, the farmers are selected by *woreda* ARDOs through predetermined criteria. While for the project seed producer

cooperatives or groups the seeds are directly supplied to the groups or follow similar roots. For ESE the farmers are selected in similar manner with the regular program but the seeds and other inputs are directly supplied by the enterprise. In all cases, farmers are responsible for all cultural practices from land preparation up to harvesting and selling at agreed time and place to unions/primary cooperatives. The farmers are assisted by development agents for proper cultural practices (date of sowing, sowing rate, herbicide application, rouging etc) as shown in Figure 9.

Be that as it may, there are differences in the approach being applied between the government and the FAO project. Under the zone ARDO system the seed producing farmers are not obliged to be in groups. The farmers are selected based on their performances and then seed is supplied and produced. No such group formation is observed. In this case the seed producing farmers may be scattered over many areas which makes inspections and collections difficult. While under the FAO-CDMDP system the best farmers are selected similar to the system of ARDO but the emphasis is given to group/cooperative formation where the farmers come together and plan together, produce seed and sale. Also more emphasis is given to their closeness to each other and accessibility. Besides, the seed is channelled to the seed producer cooperatives instead of individual farmers. So emphasis is given equally to working on the system. Under the project there are 21 seed producer groups among which 7 of them have formed seed producer cooperatives.

The CDMD Project is involved in farmers based seed production for the past four consecutive years and expected to continue over the project's coming years. The groups are producing and selling significant amount of quality seeds of different crops over the years (Figure 10) and has contributed to cheap availability of improved seeds at affordable prices to large number of farmers residing in the zone. The seed produced over the years is estimated to reach about 23,000 grain producing farmers-the spill over effect. In the year's wheat and barley seeds are the dominant in terms of area and yield obtained in response to the prevailing potentials of the two crops in the zone. For instance in 2007, these two crops accounted for 89% of the total participants and 96% of the area covered by seed producing farmers under the project.

It is also observed that the project contribution in the seed system has increased over time (Figure 13). Besides the increase in amount of seed produced, the farmers thinking have been changed dramatically in terms of the business and quality aspects of seed production. This is one of the types that differentiate the project seed producer farmers from the others. It is also evidenced that these farmers are more loyal than the other seed producing farmers through the ARDO regular program. These have happened mainly due to the intensive and continuous trainings given by the project on the technical aspects of seed production, the intensive field inspections followed thereafter and the different theoretical and practical trainings provided on the business aspects of farming through farmers' business schools established by the project in the different woredas.

ESE-Asella branch: The ESE Asella branch is producing basic and certified seed both on its farm and farmer's field and state farms on contractual basis. The enterprise produces on contractual bases crops like malt barley and some pulses crops. Significant proportion of C1 seed is produced on state farms. Generally the seed production and supply is dominated by this enterprise. Production of seeds on contractual bases over years is shown in Figure 11. As indicated in the figure below farmers involved and seed produced has shown steady growth. But seed collected and processed decreased in percentage terms (see Figure 16 chapter 3).

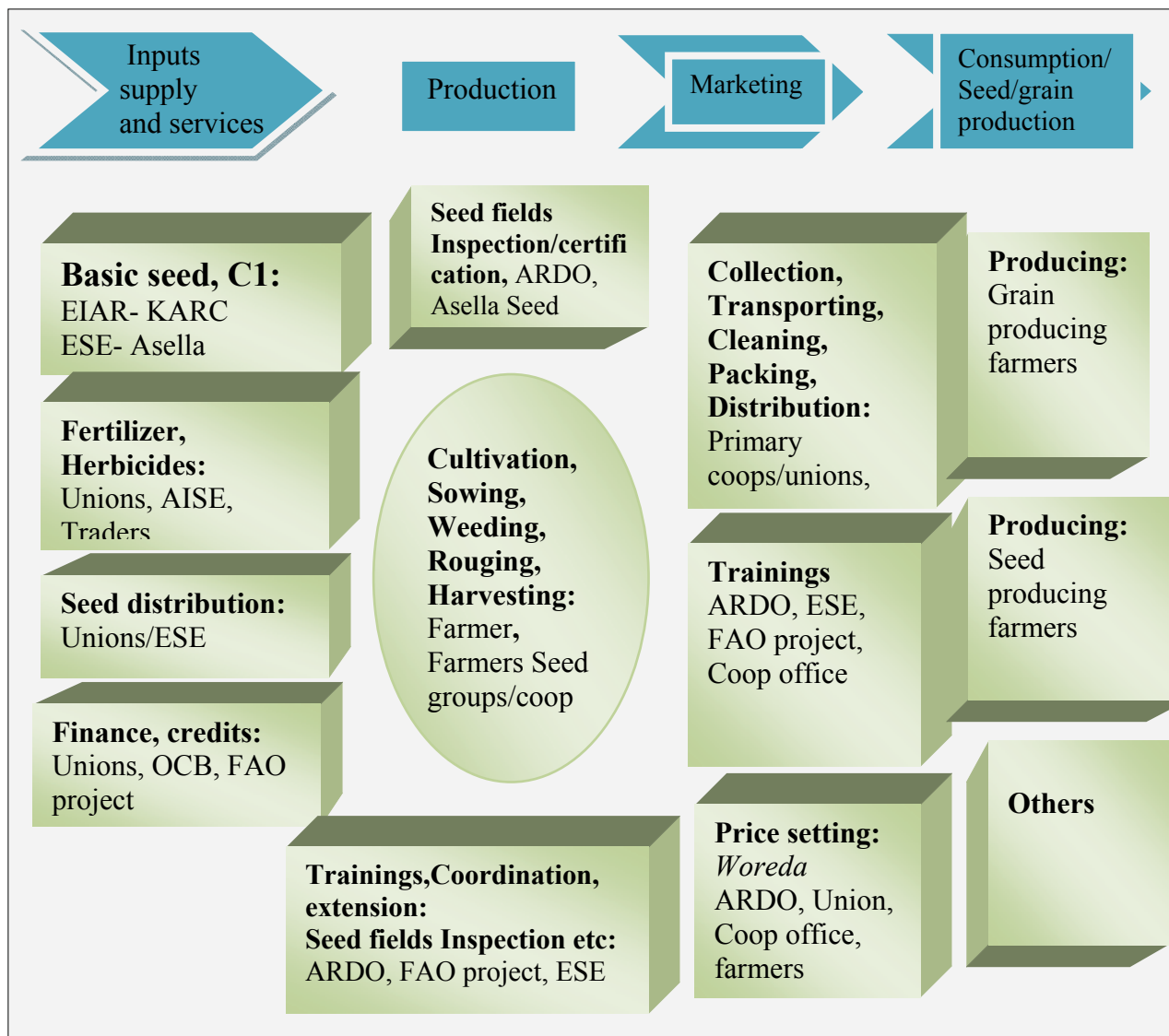


Figure 9: Major actors and activities in the whole chain for farmers based seed production and marketing

With regards to the seed production under all the conditions significant numbers of farmers are participating in seed production activities in the zone over the years and accordingly hundreds of tonnes of seeds of different crops have been produced (Figure 13). In all cases, wheat and barley crops are found the dominant among the crops produced by the seed producing farmers. The contributions of the other seed actors to the seed production have also been increasing as evidenced from the figure 13. The project seed contribution is very significant indicating its importance in increasing seed availability to the rural farmers at affordable price.

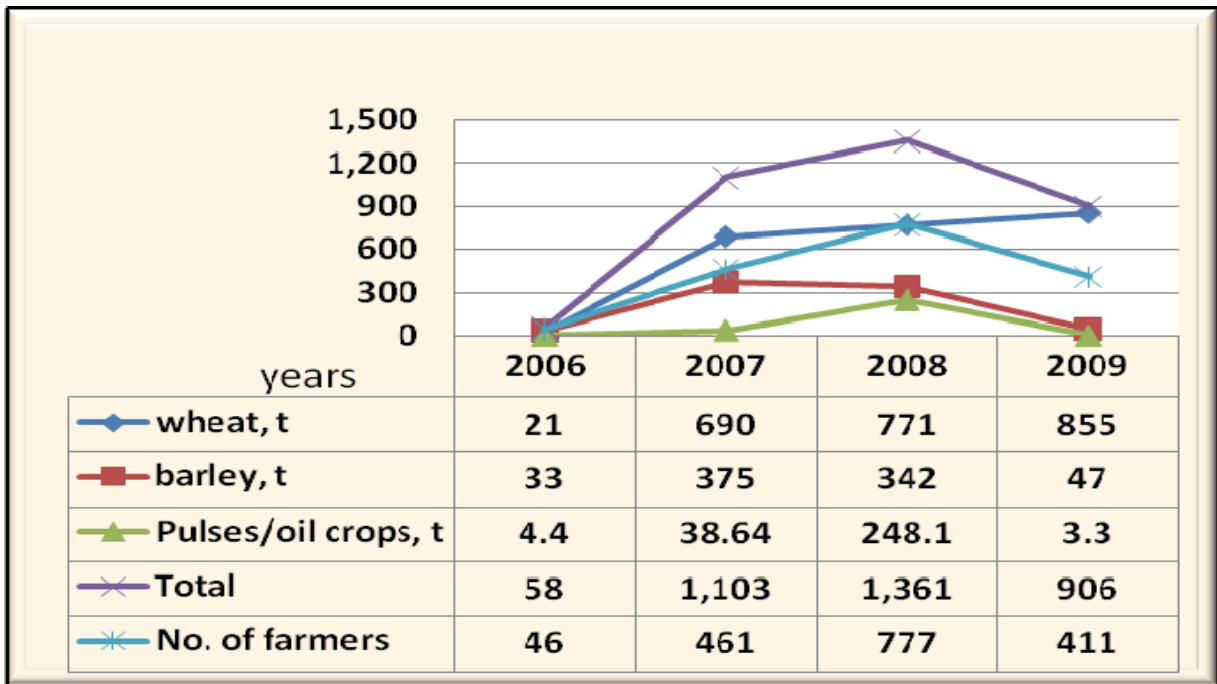


Figure 10: Seed produced (t) by the farmers' seed producers groups or coops by the FAO project and participation farmers over the years
Source: FAO-CDMDP

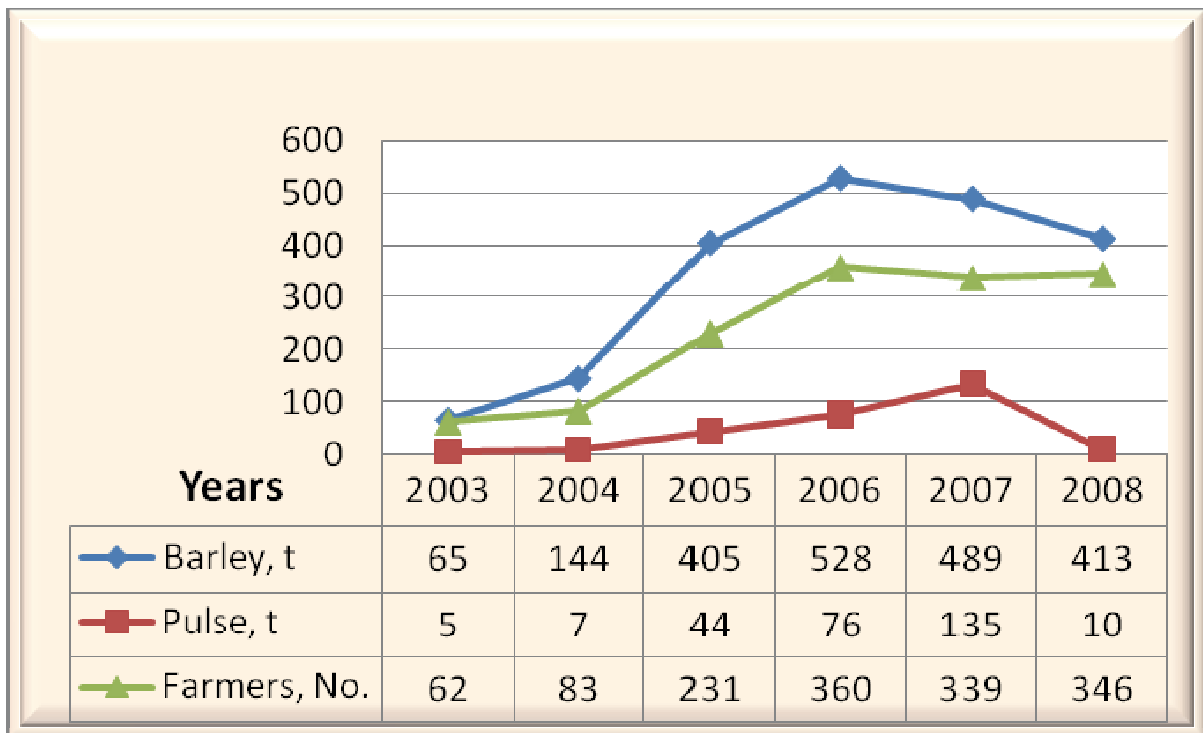


Figure 11: Farmers participated in malt barley and pulses seed production on contractual bases through ESE and quantity of C1 seed produced (t) over the years
Source: Ethiopian Seed Enterprise, Asella branch, 2009

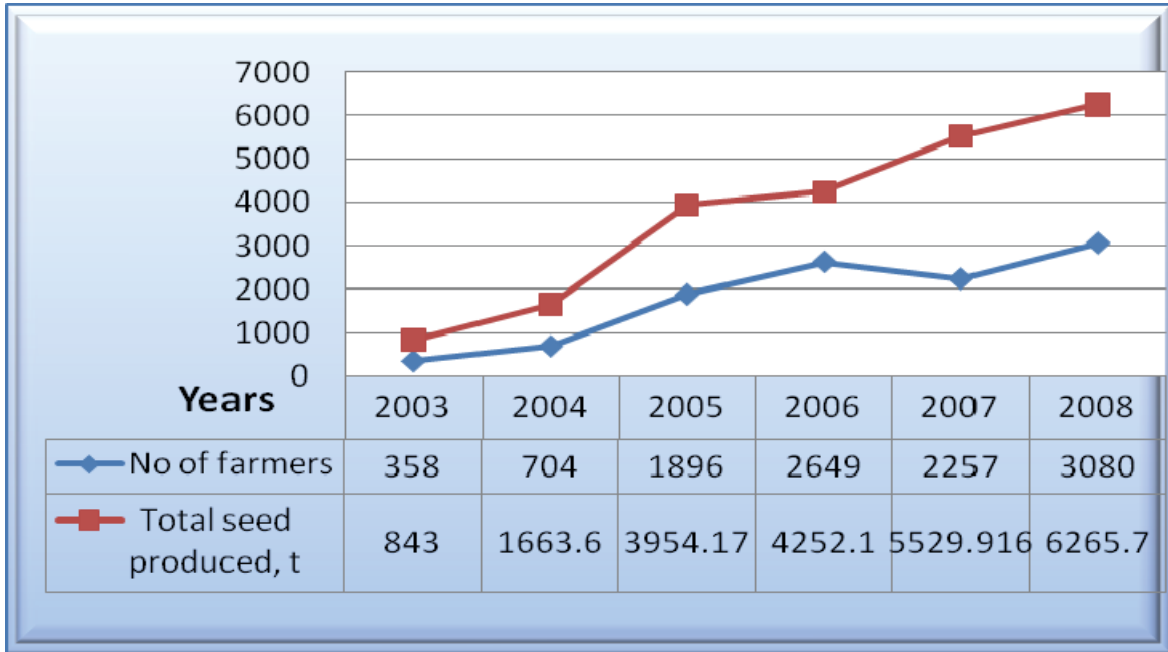


Figure 12: Farmers participated in seed production and seed produced (t) over years in Arsi zone through the three institutions (ESE, FAO and OBoARD)

Source: Arsi zone ARDO

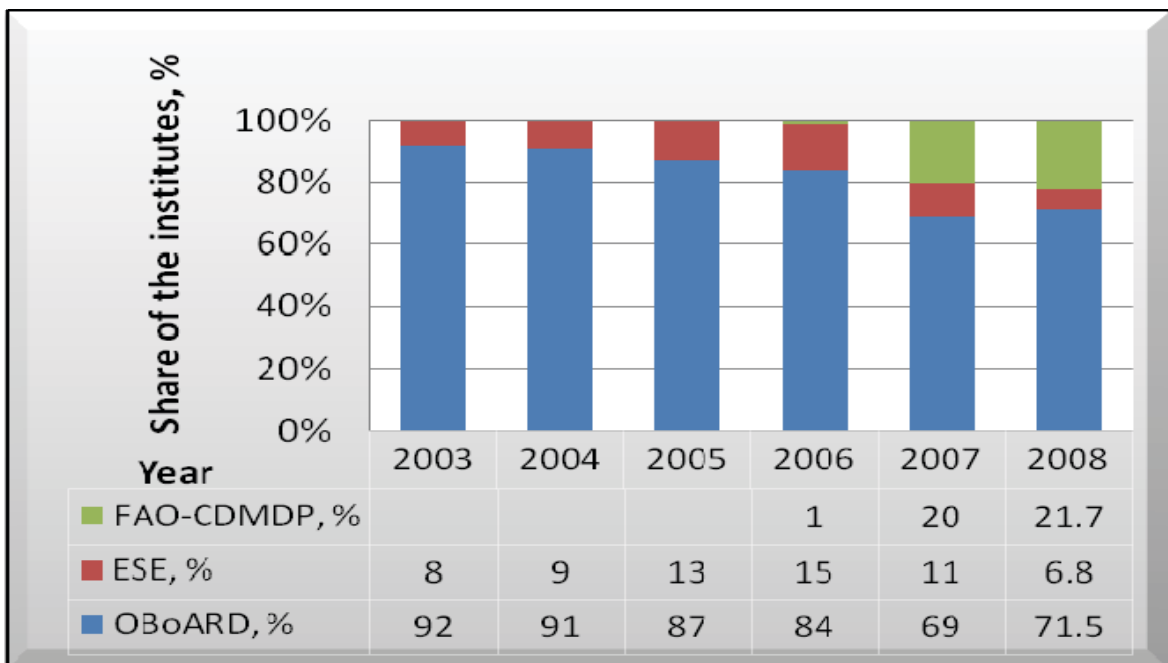


Figure 13: Share of the three institutions in seed production (tonnes) from the farmers based seed production in the Arsi zone over the years

Source: own computation

3.3. Seed Marketing and Distribution

There are many actors involved and interrelated activities at the marketing stage (Figure 14); seed quality verification, price setting, collection, storage, transport, cleaning and distribution which require especial attention and resources. The unions are responsible for marketing (buying, assembly, transport, cleaning, packaging, storing and distribution) of seed.

Price setting: Decision on seed buying price is made by a committee established for this purpose. The committee is mandated to decide on price and also make adjustments in accordance with the market condition. The committee constitutes representatives from the union, *woreda* ARDO, *woreda* cooperatives office and farmers. They make decisions after assessing the grain price at the nearest market (usually *woreda* town) upon which the seed price is pegged.

Collection, processing and distribution: The union or cooperative arranges with farmers for buying at specified place and time. Farmers transport produce to the specified spot on the arranged date. However, failures by the union to buy at the specified data have been reported with waste of time and lose of credibility to the union. Transactions also fail.

The unions transport to their premises after buying at the agreed spot. Sometimes when farmers are in urgent need for cash they transport by themselves to the union on donkey. Cooperative buys at their premises. That is transport is the responsibility of farmers. Seed bought and collected is stored in the unions store until cleaning and packaging for distribution.

Both unions have a cleaning apparatus at their premises. But they also employ manual labor for cleaning. Primary cooperatives solely use manual labor for cleaning purpose. After cleaning the seed is packed in polypropylene sack at required quantity for distribution. Distribution is conducted just prior to planting to farmers who demand certified seed. It is distributed through primary cooperatives especially for credit purposes.

In Arsi, the seed produced by the farmers or seed producer cooperatives are expected to be sold to the unions, except those farmers producing seed on contractual bases with ESE. Therefore, in accordance with agreement between unions, the farmer and *woreda* ARDO, 80% of the seed produced should be sold to the union/primary cooperatives at agreed price within specified time (15 days after harvesting). Accordingly, the seeds sold to the unions over years are indicated in Figure 15 below. The data shows that very low amount is being purchased by the unions over time despite the significant increase in farmers involved and seed produced over time. Over the six years (2003 – 2008) the total collection was only 10 % of the total production (Figure 16). The proportion of seed collected is very low in view of the significant demand for improved seed in the zone in particular and the country as a whole. So in reality the agreement is not practiced that might be due to different reasons. All the major problems on farmer based seed production are linked to problems at marketing which will be disused under constraint analysis in this chapter.

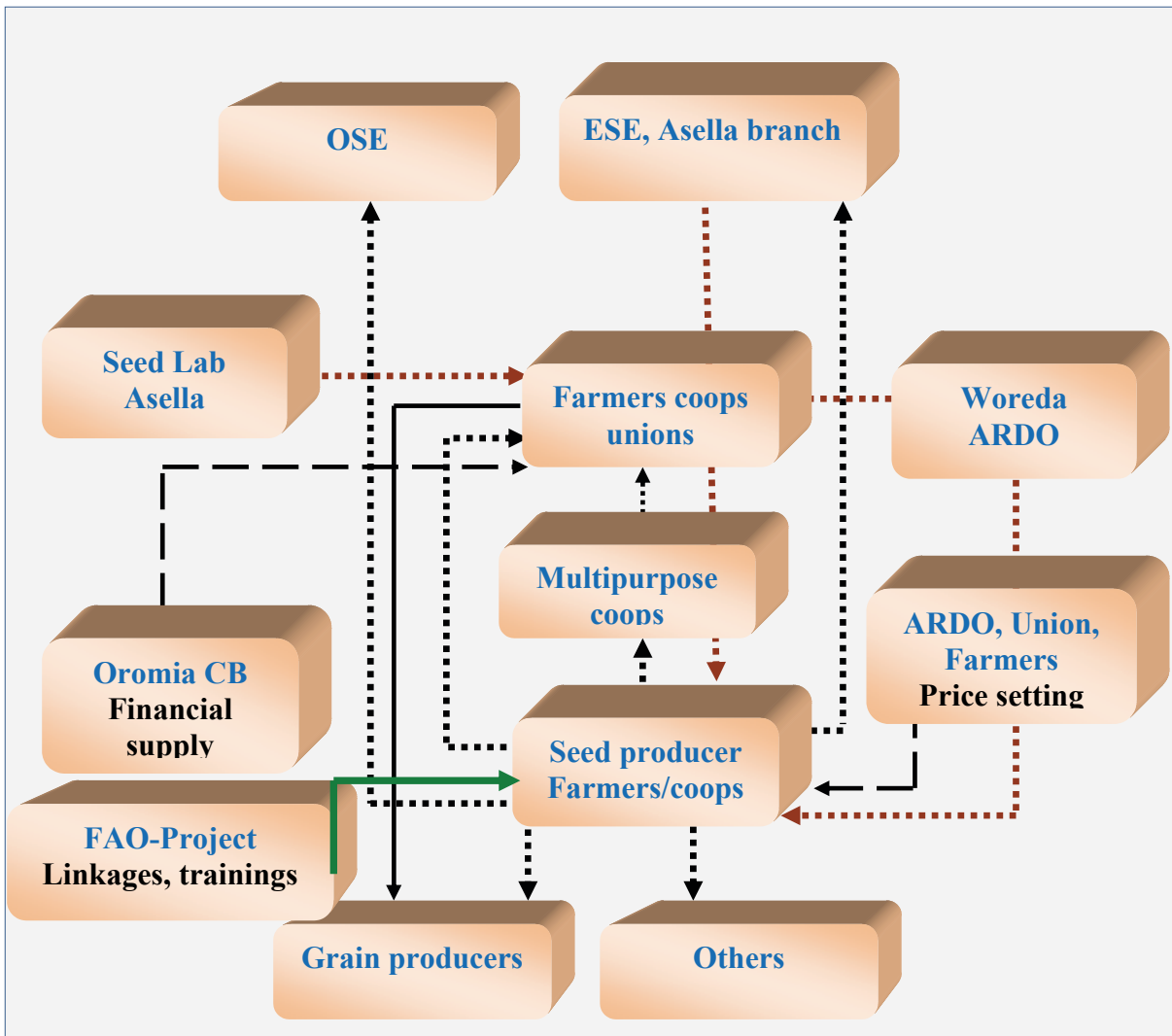


Figure 14: Flow chart for marketing of seed produced through farmers based seed production

.....→ Raw Seed → Cleaned seed → Seed quality analysis
 - - - - - → Finance/credit → Linkages/trainin

Source: own sketching

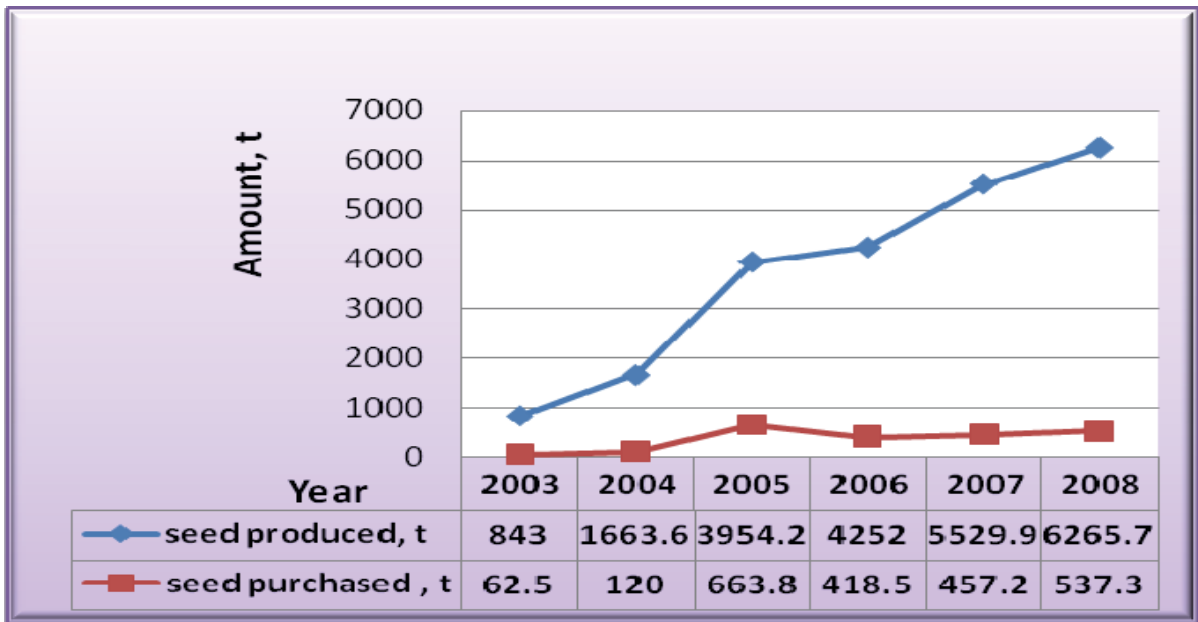


Figure 15: Seed purchased and processed by the two unions (Hetosa and Galama farmers cooperative unions) and ESE from farmers based seed production in Arsi
Source: The Unions and ESE

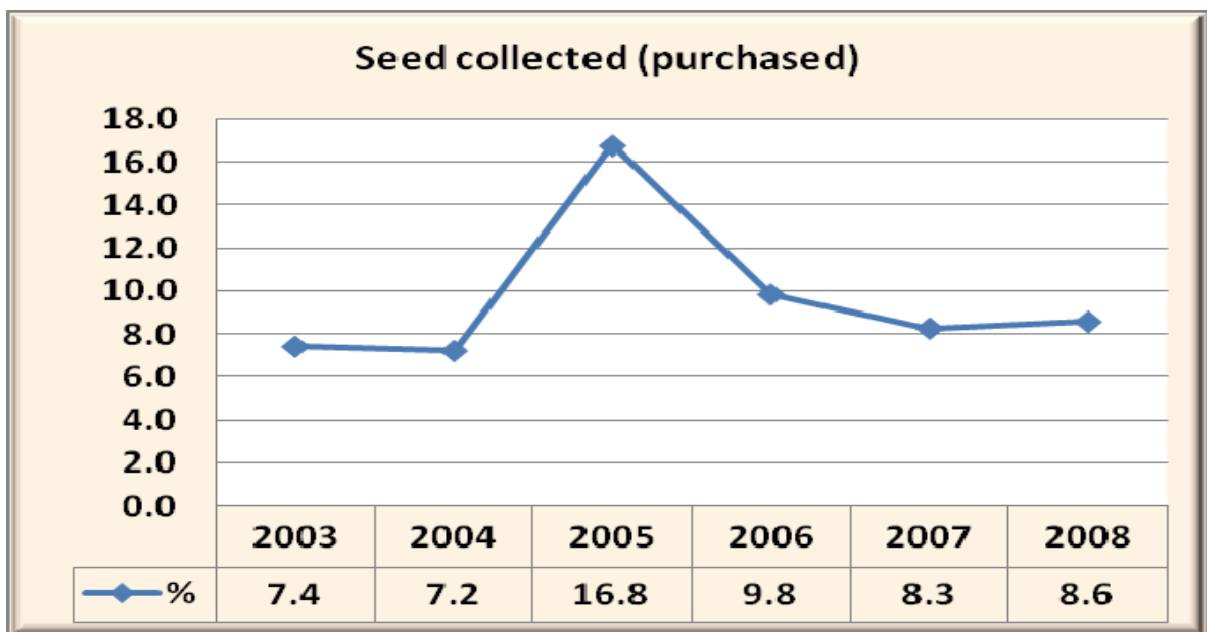


Figure 16: The proportion of seed collected (purchased) over years by the two unions and ESE from farmers based seed production in Arsi

The collection is also similar for the seed produced by ESE on contractual basis on farmer's field. The buying price is also determined by the prevailing market price for grain. The branch is responsible for collection. Then it is cleaned, packed and stored until distribution. Prior to planting the seed produced is distributed through the unions to farmers who demand certified seed. For the contractual case also there is low collection compared to the production. Over the five years (2003 – 2007) the total collection was only 33% of the total production (Figure 17). This also indicates there are issues to be cleared for the system to be efficient.

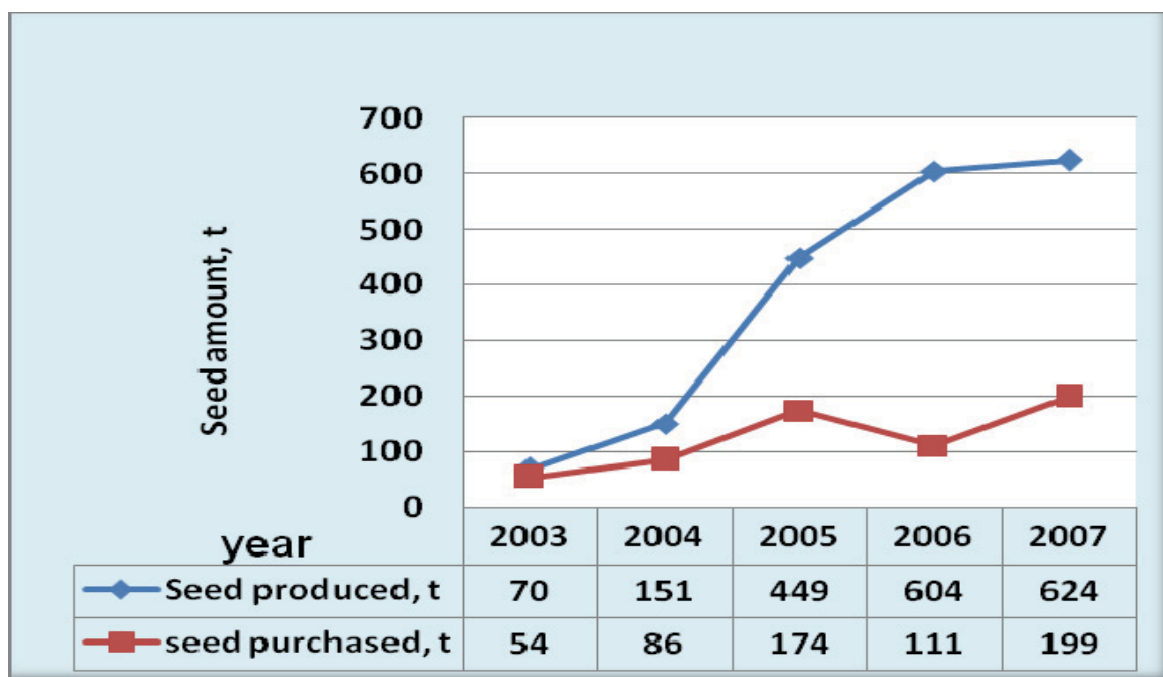


Figure 17: The proportion of seed collected over years by the ESE from farmers based seed production through contractual basis in Arsi

In view of the poor collection, the FAO –CDMD project has tried to analyse the seed disposal ways for seed produced on farmer’s field in four and three seed producing *woredas* for wheat and malt barley, respectively. Based on data collected on farmer based seed production in 2007 crop season, farmers are practicing different alternatives for disposing their seed. As indicated above, in principle, farmers should sell 80% of seed produced to unions or cooperatives within 15 days after harvest. This is also true for seed produced through the project’s intervention. But this is not adhered to through different reasons indicated below. Based on farmers’ responses there are four options for disposing seed produced. These are seed for own consumption, seeds for sell to other farmers, primary cooperatives/Unions and other uses.

Wheat seed utilization: The survey sample data indicates that 23% of the wheat seed produced was sold to other farmers directly. The share of union and primary cooperative is 34 and 11 %, respectively. Other uses which includes sell to grain merchants’ accounts for 10 % of the total output. Own seed use accounts for 22 % which is in fact higher than own seed demand. This indicates also that the farmers organized by the project sales back higher amount to the unions (45%) as compared to the one observed from farmers producing seeds through the regular programs by the agriculture and rural development offices and ESE.

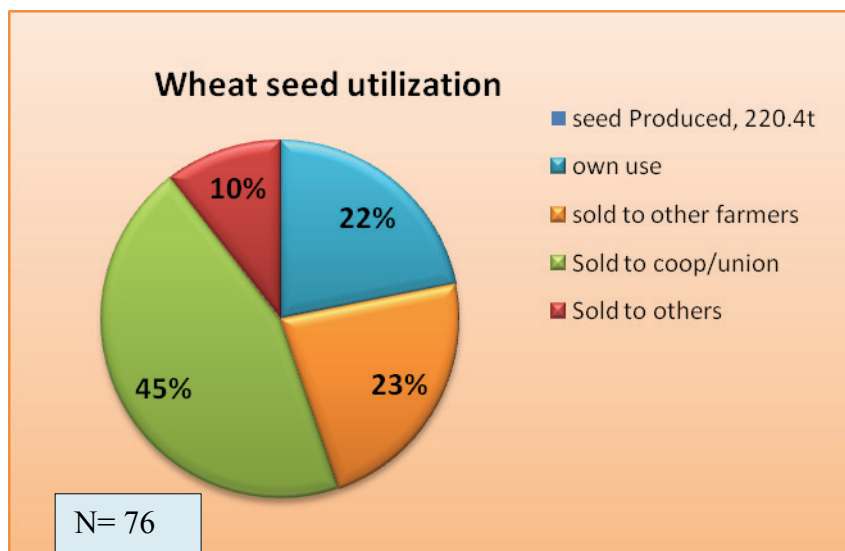


Figure18: farmer's wheat seed production and utilization in 2007/08 in the seed project *woredas*

Source: Own survey (2007)

Malt barley seed utilization: The sample data indicates that 17% of the produce is sold to other farmers directly. The share of union and primary cooperative is 46 and 7 % respectively. Own seed use accounts for 30 % which is in fact higher than own seed demand which might include sell to others including merchants. Here also significant amount is being sold through unions (53%) compared to the ARDO experiences.

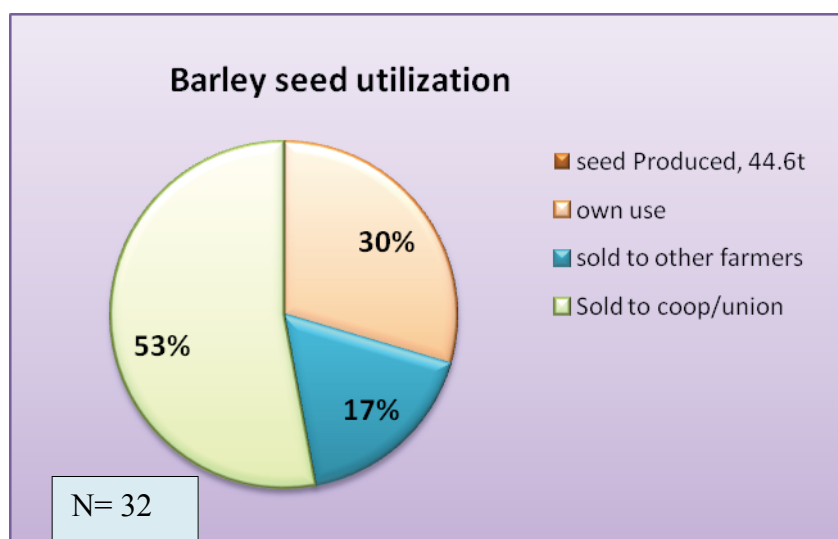


Figure 19: Farmer's malt barley seed production and utilization in 2007/08 in the seed project *woredas*

Source: Own survey (2007)

Many factors preclude farmers from selling to the unions even though it has advantage in that seed will be cleaned, stored, packed and distributed to farmers safely as seed. Precluding factors are price factors, capacity of the unions, problem of collecting from many farmers

over wide area, cost of transport especially for *woredas* such as Munessa, where distance between the union and the *woreda* is over 75 kilometres.

The price factor is the most important deterrent for selling to the unions. Seed price is pegged to market price for grain of the same variety/species at harvesting time. The regulation/agreement requires that farmers sell to the unions at 15% above market price for grain within 15 days after harvest. The problem is that price is low at harvest time. The unions are also slow in adjusting prices based on the changes in market price. There is always long time lag between market price change and unions price adjustment to the new market price. Analysis of grain price for wheat and barley at harvesting time and at near planting time showed that grain price for both crops at harvesting shows less variation compared to at planting time. Price gradually rises to over 60% late in the season, while it is low at harvest time (Figure 20). This shows that farmers can sale at higher prices even at the agreed price itself if they could have kept seeds longer. Thus, farmers always prefer to keep longer and sell through other alternatives as grain instead of submitting on time. The farmers only sell a limited amount to unions just to reveal their loyalty so that they could be provided with seed and other inputs for the coming year.

The seed producers are also scattered over many areas, which requires the unions to increase their capacity in logistics over the wider area. Hetosa Union in principle collects from Hetosa, Lode Hetosa, Tiyo and Munessa in the projects vicinity while Galama Union collects from Honqolo Wabe, Lemu Bilbilo, Digalu Tijo and Shirka. Due to the large area coverage some *kebeles* and *woredas* are not reached.

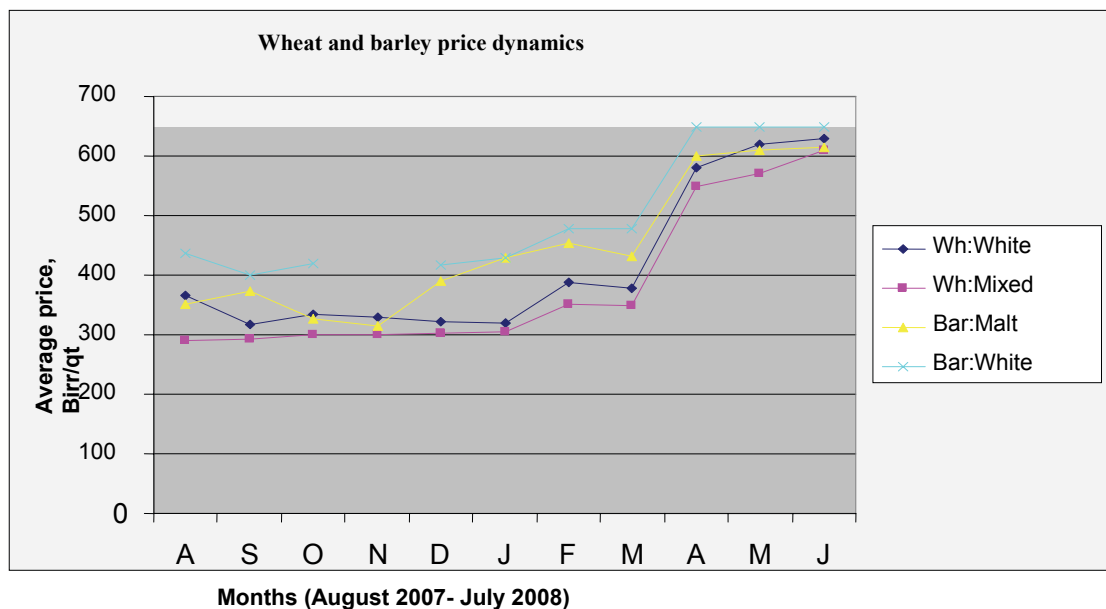


Figure 20: Wheat and barley price dynamics in months of a year (August 2007 to July 2008) in Asella

Source: FAO-CDMDP

Chapter 4 Sector Constraints and SWOT Analysis

The Constraints and Opportunities were expressed by the various actors of the seed value chain (input suppliers, producers, distributors, service providers) and key informants (ARDO experts, agriculture researchers, ESE manager, Unions managers etc) during the seed subsector study conducted in 2007 and validated by the seed value chain members on March 26-27, 2009.

4.1. Constraint analysis

Input Supply and Production

The supply of seed is constrained mainly by the inefficiency of the formal sector in terms of amount and crop varieties multiplied and varieties available for production. As depicted in the previous chapter the amount of seed nationally supplied by the formal sector is very limited. This may in part be due to the insufficient early generation seed supplied by EIAR that in turn constraints the production of initial seeds on larger scale by ESE and others. It is also related to the limited farm the ESE had for the production of Basic seeds. The other problem is related to the inadequate extension and popularization activities for some varieties by EIAR, BoARD and ESE. As a result ESE is producing only limited varieties year after. It also seems that sometimes ESE is not aware of the varieties that farmers want.

The other is lack of superior varieties which can resist diseases. Kubsa, the most popular variety to date, has been under production since many years. But this variety is susceptible to disease and hence is time to be replaced by other varieties. More new varieties of wheat are also required for the highlands. Also farmers need new varieties for other crops as well. Farmers need for barley, maize and faba bean.

The other major problem is the inefficiency in seed delivery system. Most of the time seed doesn't arrive on time. It usually arrives late at planting time. Actually it should arrive earlier in May and early June. Even sometimes seed arrives after the farmers gave up and make alternative decisions on planting. This is mainly related to the long chain it goes for the allocations at national level.

Marketing

There are many problems observed in the marketing system due to insufficient incentives arising from the pricing system and inadequate facilities (storage, transport, cleaning, and packaging), which led to the undifferentiated channels for seed and food grains. Seed price is pegged to grain price at harvest. Besides, the unions are also slow in adjusting prices based on the changes in market price. There is always long time lag between market price change and unions price adjustment to the new market price. Also purchase is not conducted on time. Purchase begins every year in December but there are areas which harvest in October and November. Some times the farmers need to sale early to cover their needs. Market arrangements are also sometimes inconvenient due to short delivery period at each *kebele*. Sometimes the unions do not stick to the prearranged time for collection of seed. Further, producers' distribution over wide area without clustering also imposes huge costs in input distribution and collection of seed. This requires the unions to increase their capacity in logistics over the wider area. This also leads to undifferentiated channels for seed and food grains.

The other problem is the traders' deliberate interference. Traders have access to information on what the union pays. Accordingly they set buying price above the unions price. This is mostly observed on malt barley seed production. They usually mix the quality seed so bought with their inferior quality grain for resale at central markets. Alternatively they hold stock until price rises late in the season.

4.2. The sub sector SWOT analysis

Strength, Weakness, Opportunities and Threat (SWOT) is a powerful tool used in developing strategies for intervention. The tool provides a framework for understanding controllable and non-controllable factors that the interventions should address for the entire value-chain. The critical issues of the SWOT are generally categorized into the following four broad categories:

S - What are the subsector internal Strengths?

W - What are the subsector internal Weaknesses?

O - What external Opportunities might move the subsector forward?

T - What external Threats might hold the subsector back?

The typical assessments of subsector's strengths and weaknesses as well as the opportunities and threats specific to each of the interventions consist of the following:

- . supply, production system and delivery of products in the value chain
- . quality of business service provisions
- competitive advantages of the value chain members
- market access, infrastructure and financial systems
- Policy environment.

While designing the interventions, the focus is generally given on the exploitation of strengths rather than simply addressing on the weaknesses. In other words, the interventions are not only about addressing the constraints, but also nurturing the strength of the subsector. Similarly, the opportunities and threats that are the external conditions that influence the subsector are also analyzed. These external forces include such circumstances as market potential, possible increased competition, changing regulations, disease pressure and so on. They can either help the subsector move forward (opportunities) or hold the subsector back (threats). But opportunities that are ignored can become threats, and threats that are dealt with appropriately can be turned into opportunities.

The following SWOT analysis of the farmers based wheat and barley seed production shows a number of Strengths and Opportunities for boosting value-adding interventions. Therefore, during designing of interventions adequate provisions needs to be created for addressing the weaknesses and threats for the growth of the subsector.

<p>Strengths</p> <ul style="list-style-type: none"> • Gentle slope with relatively high landholdings suitable for clustering • Large number of farmers involved in production • Large area coverage • High unmet demand for improved seed • Large untapped market within Arsi or country • Profit from seed production is relatively higher • Presence of strong unions and cooperatives 	<p>Weaknesses</p> <ul style="list-style-type: none"> • Inadequate basic seed supply • Late supply of inputs-seed and fertilizer • High seasonal prices variation (producers are unprivileged) • Poor supervision and difficulty in collection due to scattered farmers field • Poor/No storage facilities • Inadequate/poor cleaning facilities • Poor access to improved farming technology • Poor quality of input supply • Poor and no supply chain • Poor infrastructure in collecting the produce • Inadequate agronomic practices
<p>Opportunities</p> <ul style="list-style-type: none"> • High demand for improved and quality seed in the zone and country (ample market for seed) • Potential to participate large number of farmers • Higher seed yield through adoption of improved production technology • Backward and forward businesses development • Presence of seed enterprise and research institutions • Availability of suitable agro ecology • Extension system in place 	<p>Threats</p> <ul style="list-style-type: none"> • possible intense competition in future • stem rust disease • shoot fly • Absence of strong policy on informal seed production and marketing

Establishment of the Arsi seed forum

In view of the current situation seed in the country, after the validation work shop the stakeholders have agreed to form Arsi seed forum which will have the following duties; follow the recommendations given during the workshop, advocacy works, provide policy idea to the government, create awareness, follow the current issues and advice farmers, assist in creating sustainable system for FBSPM and finally give advisory services.

The forum has the following members;

- Zone ARDO,
- zone CPO,
- The two Unions (Galama and Hetosa),
- ESE Asella,
- OBoARD,
- OSE,
- Asella Malt Factory,
- Woreda ARDO heads,
- Oromia CB,
- CDMDP/FAO and
- Farmers' representative.

Members will initially meet to discuss the action plan for overcoming constraints. The project will prepare the action plan as discussed and recommended by the stakeholders on the workshop.

Chapter 5 Conclusion and Recommendation

Conclusions: Based on the analysis, farmers' based seed production in Arsi is technically feasible and financially viable. But due to the diverse activities involved in seed production and producers distribution over wide area there are constraints that need a concerted action. This includes addressing organizational issues, facilities and the pricing system. The farmers based seed system, despite the various constraints continued to grow and contribute significantly to the supply of major volumes of seeds for the agriculture sector. However, the following specific areas are critical and must be addressed. The specific problems are:

- Inadequate supply of basic seed
- Late arrival and at times uncertain provision of seeds
- Producers distribution over wider area
- Weak extension and supervision
- Inadequate incentives (low price) for farmers and poor collection
- Poor management during collection and mismanagement at cooperatives level
- Inadequate transport, storage and cleaning facilities
- Traders interference

Recommendations: The following recommendations and interventions are forwarded that are relevant to improve the seed supply and marketing systems for sustainable farmers based production in Arsi.

- Developing farmers' access to inputs (backward) and market (forward) for success and sustainability of seed system. Seed and farmers forum can play role in exchanging crucial information for the backward and forward linkage. The seed forum can be held twice per year and all the stakeholders including farmers' representative meet to discuss on the emerging issues and update information. The farmers' forum meeting can also be held three times a year to exchange information and discuss on their critical issues and share it with the actors on the seed forum meeting. Generally, this will strengthen the linkage and partnership among the actors and contribute to the smooth and effective functioning of the system.
- Strengthening of seed producer cooperatives/ groups. There exist potential in Arsi to strengthen the present seed producers cooperatives as well as formation of new seed cooperatives to develop the seed sector further. The cooperatives/groups may be supported in the areas of trainings, seed storage, seed cleaning machines and packaging equipments. The existing cooperatives can play a number of activities and can serve as a centre point for the improvement of the seed system. The cooperatives help to link farmers with input providers and service providers, research institutions etc. The association facilitates also the backward and forward linkages and also facilitates subcontracting works from the seed enterprises. The farmers coop also helps in facilitating discussions among members on issues related to input supply, production and marketing and in undertaking some policy advocacy.
- Building the capacities of major stakeholders involved in initial seed supply (e.g. training of professionals, supply of farm equipments and machineries, seed laboratory equipment, etc).

- Creating seed market in which seed price will be determined by market forces (supply and demand)
- Supporting the newly established Regional Public Seed Enterprise so that problems on initial planting material could be solved.
- Improving on time provision of inputs and credit service at both primary cooperative and union level
- Awareness creation on seed policy and regulation at all levels. Also policy advocacy in areas of standards (seed certification) for FBSPM as the current standards is very strict for some crops even for the formal seed sector.
- Gather and analyze information on the different forms of uses of the seed multiplied to know the fate of seed harvested by farmers.

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