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**Improving the Competitiveness of Agricultural Input Markets in
Ethiopia: Experiences Since 1991**

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Abstract

Ethiopia, a country which was a net exporter of grains and legumes about half a century ago, is now confronted with the challenge of keeping food production at pace with its population growth, preventing declining per capita food production, and reducing its dependence on food aid. With severe land degradation and low use of soil fertility inputs, crop yields remain low. Despite demonstrated potential to boost agricultural production, sustaining productivity increase has not been achieved. This paper examines the changing roles of the market agricultural oriented development policies and strategies, for the input service delivery system at the national, regional and district level and its impact on development. This paper uses information collected through participatory rapid appraisal, community and household surveys to investigate the functioning of the input market at *woreda* (district) levels, and identify innovations in the input market. We find that liberalization reforms of input markets have not succeeded in improving the competitiveness of the input market and alleviating shortage of input supply, and the involvement of the private sector remains limited. Generally, the input supply situation is characterized by demand outstripping supply, especially for improved seeds. Several innovation in input supply at the *woreda* level have been identified. These include primary cooperatives and union taking responsibility of crop input supply away from the *woreda* Office of Agriculture and Rural development; fertilizer importation and distribution by farmer cooperatives and their union; farmer to farmer supply of seeds, seedlings and planting materials; sub-contracting the manufacture of farm equipment to small-scale private manufacturers; and the emergence of private service providers. It is recommended that the negative consequence of the involvement of the public sector in input supply on the emergence and development of the private sector deserves serious attention.

1. Introduction

Ethiopia's population is estimated at 75 million in 2006, of which about 83% live in the rural areas depending on agriculture (CSA, 2005). With population growth rate of about 3%, the country is confronted with the challenge of keeping food production at pace with its population growth, preventing declining per capita food production, and reducing its dependence on food aid. Ironically, Ethiopia was a net exporter of grains and legumes about half a century ago. The same trend applies to most other sub-Saharan African countries, who converted from net exporters of food staples to dependents on food imports and food aid since the independence movement in 1960 (Byerlee and Eicher, 1997; Djurfeldt et al., 2006).

Ethiopia is endowed with rich natural resources and suitable agro-ecological conditions to improve its agricultural production significantly. Diverse agro-ecological systems usually with adequate rainfall offer opportunities to boost production. Moreover, only 40% of its potential arable land is currently under cultivation. It is also estimated that only about 5% of its potential irrigation is currently utilized (Gebremedhin and Peden, 2003).

On the other hand, in the highlands of the country (over 1500 m altitude) which account for more than 43% of the land mass and about 95% of the cultivated area, land degradation is severe (Gebremedhin and Swinton, 2003). Ethiopia has one of the highest rates of soil nutrient depletion in sub-Saharan Africa (Stoorvogel and Smaling, 1990). Land degradation in the form of soil erosion and nutrient depletion seriously undermines land productivity in the highlands.

Given this scenario Ethiopia adopted an Agricultural Development-led Industrialization (ADLI) development strategy, which initially focused on food crops and natural resource management. More recently the country has added market orientation to this strategy. Reasonably priced, and adequately, timely and sustainable supplied agricultural inputs are necessary for the commercial transformation of Ethiopian agriculture. Such inputs include fertilizers (organic and inorganic), improved seeds, planting materials, agricultural chemicals, veterinary drugs, improved animal breeds, artificial insemination (AI) services, and farm equipment such as beehives, irrigation equipment, hay brooders, ploughs, butter churns and others. The role of competitive agricultural input markets is

more important for the commercial transformation of agriculture than for subsistence production. Due to the current low income and liquidity constraint level of Ethiopian farmers, the supply of rural credit services needs to accompany the supply of agricultural inputs.

However, there is little evidence regarding how this market orientated strategy and previous strategies are being implemented in practice and the extent of their effectiveness in improving the performance of the input market. Liberalization policy reforms, if unaccompanied by complementary institutional strategies, may not achieve the expected results of enhancing the involvement and development the private sector and improve the efficiency of the input market. Also, various views are forwarded regarding the effectiveness of agricultural market liberalization¹ in stimulating agricultural growth (Jayne et al, 2002). Some politicians contend that response from the private sector is usually too slow to stimulate agricultural development, and that the public sector needs to be involved in the supply and distribution of key agricultural inputs. This argument has been the basis for the slow liberalization of input markets or even reversal of liberalization policies.

The purpose of this paper, therefore, is to assess the effect of the policies and strategies on restructuring and functioning of the input market and associated rural financial services at the federal, regional and *Woreda* (district) level (i.e ground-truthing how reforms have actually been implemented), and investigate improvements (or lack of) in the competitiveness of the market. Results are based on analysis of information collected through participatory rapid appraisal (PRA), and community and household level surveys conducted in eight woredas² in the four Ethiopian regional states of Tigray, Amhara, Oromia and SNNPR. Particular emphasis is given to innovative approaches in input supply and credit services.

The paper is organized as follows. The next section presents a review of the efforts made to liberalize the agricultural input market and related credit services in Ethiopia since 1991 and its effects, based on a review of the literature. Section three

¹ Market liberalization in this paper is defined as changes in policies intended to encourage private investment by and remove barriers to entry.

² The districts are selected as Pilot Learning Woredas (PLWs) for the Improving Productivity and Market Success (IPMS) of Ethiopian farmer's project that the International Livestock Research Institute (ILRI) is implementing on behalf of the Ethiopian MoARD.

describes the study conducted at the PLWs. Section four presents the general characteristics of the agricultural input supply and delivery system in the study areas. Section five deals with the extent of availability of input supply and credit services at community level. Section six presents results of descriptive analysis of farmer use of commercial fertilizer and improved seeds based on analysis of household level data. Section seven analyzes the emerging innovations in agricultural input supply. Section eight concludes the paper and draws implication to improve the performance of the input market.

2. Liberalization of the fertilizer and seed sector in Ethiopia since 1991: expectations versus realization

2.1 Input supply policies and institutional arrangements

In Ethiopia, efforts have been made to liberalize the input supply market and improve its competitiveness since 1991. Moreover, a strategy document on input and output marketing and implementation mechanisms prepared by the Ethiopian Ministry of Agriculture and Rural Development (MoARD) in 2004 emphasizes the critical role of an efficient and competitive input markets for agricultural development (MoARD, 2005). The strategy, while recognizing the role of the government, the private sector, and farmer organizations in input supply, emphasizes the need to enhance increased privatization of input supply and rural finance, a shift away from the current heavily government controlled system.

A series of proclamations and council of ministers regulations that relate to agricultural input supply have been issued in Ethiopia since 1991, presumably to improve the efficiency of the input supply market in the country. In 1993, the National Seed Industry Agency (NSIA) was established by Proclamation No. 56/1993, as an autonomous government agency governed by a council. The council was mandated to submit seed-policy related proposals to the government and oversee their implementation upon approval, and issue guidelines to promote the development and expansion of the seed industry. The powers and duties of the agency included, among others, encouraging investors to actively participate in the production and distribution of seeds. As a supplement to this proclamation, Seed Proclamation, Proclamation No. 206/2000 was

issued in 2000. The proclamation stipulates the conditions for involvement in the seed sector business.

Another autonomous government agency, the National Fertilizer Industry Agency (NFIA) was established during the second half of the 1990s. Similar to the NSIA, the NFIA has as one of its duties and powers, to encourage the involvement of the private sector in the fertilizer business. As a supplement, the Fertilizer Manufacturing and Trade Proclamation, Proclamation No. 137/1998 was issued in 1998. In 2001, NSIA and NFIA were made answerable to the newly created Ministry of Rural Development (MoRD), which was mandated to ensure that conducive conditions were created for the development, processing and supply of inputs necessary for rural development.

In 2002, the National Agricultural Input Authority³ (NAIA) was established by Proclamation No. 288/2002 as an autonomous body of the government. The proclamation dissolved the NSIA and the NFIA, and the rights and obligations of the two agencies were transferred to the NAIA. The NAIA was mandated to ensure that production, supply, distribution, and marketing of agricultural inputs is undertaken in efficient and effective manner, and capacity is built in the sector to benefit producers and the user community. Its powers and duties included, among others, formulating agricultural input policy and strategy based on the national rural development policies and strategies and follow up implementation upon approval, and encourage the private sector to actively participate in the production and distribution of agricultural inputs.

In 2004, the Ministry of Agriculture and Rural Development (MoARD) was created by proclamation No. 380/2004, merging the Ministry of Agriculture (MoA) and the MoRD. The powers and duties of the Ministry included among others, to provide comprehensive support to private investors engaged in the agricultural sector, and to make the necessary support in capacity building in production, supply, distribution and marketing of agricultural inputs⁴. The powers and duties of the NAIA were transferred to the MoARD. Later on, the NAIA was dissolved. Currently, the MoARD is structured in

³ Agricultural input was defined in the proclamation as “plant seed, fertilizer and pesticides available for market to improve production and productivity of the agricultural sector”. This definition essentially limited agricultural inputs to crop inputs.

⁴ Agricultural inputs in this proclamation was defined as “plant seed, fertilizer, improved small agricultural implements, modern beehives, improved variety of livestock breeds, livestock feed, and small scale irrigation and water harvesting materials available for market to improve production and productivity of the agricultural sector and include other inputs as such designated by the Ministry.”

three State Ministries, one of which is the State Ministry for Agricultural Marketing and Input Supply, which is the regulatory government body on input supply and agricultural marketing

2.1 Fertilizer system evolution

Along side the developments in the public regulatory organizations with particular mention on the need to encourage private sector involvement in the input markets, a series of measures has also been introduced since November 1991 to liberalize the fertilizer supply and marketing in Ethiopia. The fertilizer market was completely controlled by the state parastatal, the Agricultural Input Supply Corporation (AISCO⁵) (renamed as the Agricultural Input Supply Enterprise (AISE) in 1996) until 1992. In 1993, the government removed the ban on private importation of fertilizer. In 1996, the government lifted control on fertilizer import and wholesale prices, while retaining control of retail prices. In 1997, fertilizer subsidies and regulation of fertilizer retail prices were removed⁶ (Demeke, 1998).

In 1993, the Ethiopian Amalgamated Limited (EAL) became the first private company to import and set up its own fertilizer supply network. In 1996, the EAL was able to account for 27.9% of fertilizer import to the country. However, EAL failed to import fertilizer in 1997 due to large unsold stock carry over. A second firm, Ambassel Trading House Private Limited Company joined the fertilizer business in 1994, mainly as a wholesale and distribution agent of AISE, receiving its supplies from the port of Assab.

In 1996, Ambassel started to import fertilizer. EAL and Ambassel accounted for 35.1% of fertilizer import in 1996. Each of the three importers had its own distribution, wholesaling and retailing network. Three additional distributors/wholesalers, viz. Dinsho, Guna and Wondo joined the fertilizer business in 1996-97. The fertilizer market

⁵ AISCO was established in 1985 (during the Derg regime). During 1978-84, the Agricultural marketing Corporation (AMC), a state owned parastatal, was the sole importer and distributor of fertilizer.

⁶ Until January 1997, fertilizer prices were subsidized by 20% to 30% depending on the location. Moreover, pan-territorial pricing policy on fertilizer was used. Among the fear that removal of subsidy would result in lower fertilizer consumption, Demeke et al (1997) suggested the following as means to reduce cost of fertilizer to farmers: adjusting the month of purchase abroad (June-July, instead of December-February); more competitive bidding;; economies of scale in purchase; bulk purchase instead of bag purchase; use of chartered vessels; use of larger vessels; improving port and clearing services; and more competitive wholesale, retail and transport services.

liberalization also led to the phasing out of the marketing centers of AISE in 1996 (Demeke, 1998)⁷.

As the New Extension Program (NEP) launched by the Ethiopian government progressed, fertilizer imports increased by 67% between 1990 and 1995, and by additional 56% between 1995 and 1998 (Jayne et al, 2002). The NEP also prompted regional governments to coordinate the supply of fertilizer and seeds on credit and select distributors to supply farmers with the inputs. In 1998, the government started using tenders to determine firms to supply fertilizer for the NEP. In 1999, the NEP accounted for 67% of total fertilizer sales to farmers on in-kind credit (Jayne et al, 2002), with only 14% sales made in cash. Jane et al. (2002) claim that most of the tenders went to the Ambassel (in Amhara), Wondo (in the south), Dinsho (in Oromia) and Guna (in Tigray) distributors.

Excess supply became a serious problem in 1996 and 1997 (Demeke, 1998). In 1996, only 59.4% of total available supply was sold, when about 164, 932 tons of fertilizer was left unsold. During this year, AISE sold 72.9%, while Ambassel and EAL sold 75.5% and 29.2% of their stocks, respectively. In 1997, about 113, 936 tons of fertilizer was left unsold (Demeke, 1998). That the EAL was able to sell less than 30% of its stock is indicative of the absence of a competitive level field in the fertilizer market in the country by then.

A number of key observations can be made regarding the development of the fertilizer market since the introduction of input market liberalization policies. Despite the series of proclamations that emphasized the need for enhanced involvement of the private sector in the fertilizer business, involvement of small-scale wholesalers and retailers in the business remained low, hence limiting the competitiveness of the market. For example, in 1997, 80% of AISE's sales was effected through the distributors/wholesalers (mainly Ambassel, Dinsho and Guna)⁸.

Inadequately competitive fertilizer market discourages entry into the business and limits investment in market infrastructure. In almost all regions, competition had not

⁷ Ambassel took over nearly all the marketing centers of AISE in the Amhara region, while Dinsho took over the centers in most of Shewa and Arsi.

⁸ The remaining share was handled by retailers, individual farmers and non-peasant sector.

reached all the way down to the woreda level, since companies usually operate in different localities essentially enjoying nearly monopoly power in their respective localities of operation.

Although access to fertilizer and use had increased due to liberalization until 1996/97, major problems remained with the functioning of the fertilizer market, including poorly developed retail markets and so limited market access to retail outlet, credit supply that seemed to discourage competition and lead to market concentration resulting in uncertainty and risk to new entrants.

The experiences also indicate to the resultant potential threat that could be perceived by new entrants in to the fertilizer market. Incomplete or partial implementation of policy reforms, and the near-reversal of policy reforms would obviously deter entry. The experience also attests that, while designing market policy reforms, critical attention needs to be accorded to institutional strategies that need to accompany the reform.

2.2 Seed system evolution

Closely related to the use of fertilizer in Ethiopia (as elsewhere) is the availability of improved seeds. The Ethiopian Seed Enterprise (ESE), established in 1979, has been the government parastatal involved in the production and distribution of improved seeds. The enterprise focuses mainly on cereals (wheat, barley, maize and sorghum). In the last 25 years, ESE's performance indicates that of its total operation, wheat accounted for 65%, Maize for 21.94%, and the remaining is accounted for by other cereals, pulses and oil crops. According to ESE, the main reasons for its focus on wheat and maize are that the cereals are major food crops, and the availability of improved seeds from national and international research (including the CGIAR) centers.

Prior to 1991, ESE used to depend on state farms and producers cooperatives. Since 1991, the ESE shifted to large scale and small private farms, and its own farms which are meant mainly for production of basic seeds. By 2005, small farmers share of ESE's supply of improved certified seed grew from 10% to 43% on area basis. Between

1991-1995, the progress of ESE in setting up a retail distribution system was, however, very slow (Howard et al, 1995).

The major seed distribution system used by the ESE is wholesale and retail at its seed processing and distribution centers, and marketing through cooperatives. Small farmers are now the major clients of ESE, compared to the pre-1991 period where the major clients were the state farms and cooperatives.

Currently, the demand for improved seeds is much higher than the supply. ESE has not been able to meet the growing demands for improved seeds in the country. Among the major problems ESE claims to be encountering include dealing with small and dispersed farmers leading to adulteration and inefficiency in operation and transport, default in seed delivery by small farmers in expectation of higher market prices, sub-standard quality and quality deterioration during storage at farmer's holdings, inefficient seed demand assessment mechanism, and influence of grain price instability.

As future strategy, the ESE considers organizing farmers' seed producers cooperatives, and intends to limit itself to pre-basic, basic, and parental seed multiplication and intends to strengthen its wholesale and retail activities through opening new stores and distribution centers located at strategic locations, use farmer cooperatives as commission agents for seed sales, and increase involvement of private seed dealers (ESE Officials, Personal Communication).

2.3 Input credit system evolution

The fertilizer and seed market in Ethiopia is closely related to the supply of credit to farmers to purchase the input, since fertilizer and seed sales are mainly financed by credit. An excellent description of the evolution of the input supply financing is provided by Wolday Amha (2004).

Prior to 1996, the financing of agricultural inputs in Ethiopia was organised through the Agricultural and Industrial Development Bank (AIDB), later on called the Development Bank of Ethiopia (DBE) and the Commercial Bank of Ethiopia (CBE) which became involved in the provision of input credit in 1994. Both Banks provided input credit mainly for chemical fertilizer and improved seeds through the intermediaries namely Service Cooperatives, Peasant Associations and farmers groups. In 1997, the DBE terminated the provision of agricultural input loan to rural households mainly because of the poor repayment of loans.

According to Adugna and Demeke (1999), owing to high defaults, which seriously affected the liquidity position of banks, a new arrangement of input credit delivery and collection has been introduced in 1996/97 (particularly for the new extension program, which had been piloted by SG 2000 in 1993-94) in the regions. Under the new

arrangement banks provided input credit to farmers only after the regional governments guarantee the loans. The CBE was not therefore involved in collecting the loans from the small farmers. Instead, the regional governments pay the CBE and recover all loans directly from the farmers.

The extension staff of the regional bureaux of agriculture were given the responsibility of providing and managing input loans to the participating farmers. In order to ensure the full recovery of loans, an Input Coordinating Committee (ICC) unit was established for the first time at all levels (from Keble to federal level). The new ICCs were given full authority to follow up input loans and enforce its timely repayment. All key government bodies are members of the committee and share the risk. However, the agricultural extension staff did the lion's share of the responsibility of input loan assessment, inputs distribution, collection of down payment, and collection of loans at all levels. The role of Development Agents in input loans administration became thus significant with the advent of extension package program and since the regional government assumed responsibility for guaranteeing input loans. More recently, the Regional Cooperative Promotion Bureaux have begun playing an active role in managing input loans channeled through cooperatives.

Around 1996, the Micro Finance Institutions (MFIs), which had thus far been operated by NGOs in urban areas, became more formalized and also started playing a role in the financing of agricultural inputs in the rural areas. However, these inputs were initially not part of the new extension packages, mentioned previously. At the request of the regional governments, MFIs in some Regions did however become involved in the financing of the NEP loans with funding from the CBE, guaranteed by the regional governments.

According to Wolday (2004) the overall system of delivering input loans thru the various institutions was found to be unsustainable. The regional and local governments are shying away from providing guarantees to the CBE for input loan. The staff of the Regional Bureau of Agriculture are too much involved in the distribution and repayment activities of input loans at the expense of other extension activities. Also input loans are the major business activity for most of the multi purpose cooperatives and for some it is the only activity. Also MFI's are not interested in input loans under the existing arrangement, in which the emphasis is on the technical aspects and insufficient attention is paid to the financial aspects.

A strategy therefore need to be developed in which synergetic working arrangements between staff from the agricultural offices and staff from finance institutions is developed. The increased involvement of the finance instiruions should alos lead to them absorbing the risks of these loans, thus gradually reducing the the loan guarantees provided by the regional governments.

3. The Study *Woredas* (districts) and methodology.

The study is conducted in the eight pilot learning woredas (PLW) of the Improving Productivity and Market Success (IPMS⁹) of Ethiopian farmers project in the four regional states of Tigray, Oromia, Amhara and the South (See Figure 1).



The PLWs included in the study are Ada'a Liben and Mieso woredas in Oromia; Fogera and Metema woredas in Amhara; Atsbi Wonenbeta and Alamata woredas in Tigray; and Dale and Alaba woredas in the South. Brief description of these PLWs is given in Annex 1.

To obtain the necessary information IPMS conducted a participatory appraisal of

Ada'a Liben woreda is located in Oromia region about 50 km southeast of the national capital, Addis Ababa, at an altitude range of about 1600-2200 masl. The district is characterized by good market access, adequate rainfall and good soils. Teff is the major crop grown, followed by wheat and pulses, especially chickpea. Dairy production is identified as important market oriented livestock enterprise. Mieso woreda is located 300 km east of Addis Ababa, at an altitude of range of 1107 to 3106 masl. However, most of the district is found at about 1700 masl. Meiso is one of the districts in Oromiya where pastoralism, agro-pastoralism and mixed crop/livestock production systems are practiced. The dominant livestock types in both farming systems are cattle and goats. Recurrent drought is a major problem.

⁹ See Annex 1 for a brief description of the IPMS project and its objectives.

Fogera woreda is found in the south Gonder zone of the Amhara region about 600 km northeast of Addis Ababa and about 60 km north of the regional capital of Bahir Dar. Altitude in the district ranges from 1600 to 2200 masl. Average annual rainfall is more than 1000 mm. The major crops grown in the district are rice, finger millet, maize, teff, barley, Niger seed (Noug), and vegetables (especially hot pepper and onion). Livestock and apiculture are important sources of cash income to farmers. Metema district is located about 900 km northwest of Addis Ababa and about 360 km west of Bahir Dar town, the regional capital. The district has an international boundary of more than 60 km with the Sudan. Although altitude of the woreda ranges from 550 to 1608 masl, nearly all of the cultivated land in the woreda is in the lowlands (between 650 and 850 masl). Farming is basically commercial oriented, with sesame, cotton and sorghum being the important crop commodities. Livestock, especially cattle are also important source of income for farmers.

Atsbi Womberta district is located in Tigray region at about 950 km north of Addis Ababa and at about 80 km north east of Mekelle, the regional capital. Most of the district lies at an altitude range of 1600-2700 masl. The major crops grown are barley, wheat, teff and highland pulses (faba bean, field pea and lentils). Apiculture is an important source of income to farmers. The district is also an important supplier of sheep and goat to the regional capital and neighbouring towns. The major agricultural production problems are soil moisture stress and other forms of land degradation. Alamata woreda is located in the northern region of Tigray at about 700 km north of Addis Ababa and about 180 km south of the regional capital, Mekelle. Most of the district is located in the Raya valley at an altitude of about 1500 masl with moderate soil fertility. The major crops grown are sorghum, teff, and maize. The district is also important supplier of beef in the region. The major problem of agricultural production in the district is soil moisture stress.

Dale woreda is located in the Sidama zone of the Southern region about 320 km south of Addis Ababa and about 50 km southeast of the regional capital of Awassa. Most of the district is located at altitude ranging from 1600 to 3000 masl. The district is divided into two distinct farming systems. A coffee-fruits perennial crop production system with adequate rainfall covering about two-thirds of the district, and a drier cereal

crops-livestock production farming system. The major crops grown are coffee, fruits, spices, haricot bean, maize and teff. Enset (false banana) is also widely grown. Maize is an important food crop in the area. Livestock are important sources of income to farmers, especially in the drier farming system. Alaba woreda is located about 310 km south of Addis Ababa and about 85 km southwest of the Southern regional capital of Awasa. Altitude in the woreda ranges from 1554 to 2149 masl, but most of the woreda is found at about 1800 masl. Rainfall is a major limiting factor in agricultural production in the area and drought is observed recurrently affecting many households. The major crops grown in the woreda are maize, wheat, teff, sorghum, finger millet, haricot bean. Hot pepper is an important cash crop. Livestock, especially sheep and goat, are important source of income to farmers.

4. General characteristics of current agricultural input and credit system in the study areas

4.1 Agricultural input supply system

As it currently stands, considering the supply and distribution of agricultural inputs in Ethiopia, the inputs may be grouped into two categories: inputs whose demand is assessed/planned by the Woreda Office of Agricultural and Rural Development (OoARD) and inputs whose demand is not estimated/planned by the OoARD. The OoARD assessed/planned inputs include various agricultural extension packages inputs (regular, minimum and household packages)¹⁰, for which, usually, funds are arranged through government channels. In this paper, we refer to these inputs as “extension” inputs. Inputs not assessed by the OoARD will be referred to as “non extension” inputs. It

¹⁰ The minimum package stipulates that farmers can use improved seeds with traditional soil fertility management and moisture conservation practices. The regular package stipulates farmers to use improved seeds together with commercial fertilizer, chemicals and soil moisture management practices. The household package requires farmers to choose from a menu of extension packages centred around the use of a pond, ground well, or other forms of irrigation such as river diversion. This indicates that household package could include improved beehives, treadle pumps, improved seed and improved poultry. In addition, it may also include dairy cows, oxen for traction, bee colony, fattening (cattle and small ruminants), fertilizer, local poultry, and local seed. This has been similar for both Tigray and Amhara regions.

should be understood that some inputs assessed by the OoARD in one region may not be assessed in other regions. Also, in a given area an input may fall into both categories (e.g. the OoARD may provide animals for a government designed cattle fattening extension program while simultaneously farmers in the same area may independently purchase/finance animals for his fattening project).

For the supply of “extension” inputs, three steps can be identified, (1) estimation of farmer needs of inputs, (2) production/procurement of inputs, and (2) delivery of inputs. The procedures for estimating the need for “extension” inputs is more or less similar throughout the country i.e. estimates are made principally by development agents (DAs) in Peasant Associations (PA) and are forwarded to the OoARD (input supply desk/unit and/or cooperatives desk). Inputs can then be produced/procured locally and centrally. For “centrally” produced or procured inputs (fertilizers, improved seeds, improved cattle, improved poultry) the OoARD forwards the request to the regional level, which then organizes the supply through companies or firms which either purchase or produce the inputs (eg. fertilizers – AISE, Amalgamated, Ambassel, Guna, Dinsho, Wondo, others; improved seeds-Ethiopian Seed Enterprise, others; improved heifers and poultry- state ranches and multiplication centers). The OoARD then distributes the inputs to farmers upon arrival, mainly on credit basis.

Estimates for “extension” inputs which are not “centrally” produced or procured are dealt with by the OoARD itself. The animals for fattening which are included in the “extension” packages are purchased with the help of OoARD and village level staff in local markets from traders. A committee comprised of staff members of the OoARD is formed who encourages the DAs at the PA level to form groups of farmers (with 1 team leader). The group members purchase the animals with the help of the committee from local traders in the local markets. The supply of improved dairy animals mainly comes from government ranches and supply is very limited compared with the demand. Some farmers purchase improved animals from the commercially operated farms in the surrounding.

In almost all of the study woredas the OoARD is involved in the supply of farm equipment such as treadle pumps, irrigation pumps, and improved beehives mainly on credit, and AI and veterinary services and drugs mostly on cash basis. However,

innovations in the production of some of these inputs have been identified in the different woredas (See section 7 below).

All “non extension” inputs are produced and supplied in various ways, with higher involvement of the private sector (compared with the “extension” inputs). Considerable variation also exists in the farm delivery of “extension” and “non extension” inputs. In principle six delivery channels are identified 1) through the OoARD (usually the input supply desk), 2) through primary cooperatives and unions, 3) farmers, 4) private shops/service providers/traders, 5) market agents and 6) NGOs. Generally, the input supply system is characterized by demand outstripping supply, except for occasional stock carryovers of commercial fertilizer. Shortage of supply is particularly critical for seeds, seedlings, and planting materials.

4.2 Agricultural input supply credit system

The link between the credit services and the purchase of agricultural inputs varies from region to region. In the Amhara and Tigray regional states, where the household extension program is most emphasized, the credit services provided by the Amhara Credit and Saving Institution (ACSI) in Amhara, and the Dedebit Credit and Saving Institution (DECSI) in Tigray, are closely linked with the purchase and use of the “Extension” inputs. Funds are obtained from the CBE and repayment is guaranteed by the regional governments.

On the contrary, in Oromia and the Southern regional states, where the household extension programs are not as emphasized, the credit services of the Oromia Credit and Saving Institution (OCSI), in Oromia, and that of the Omo Microfinance Institution (OMFI) and the Sidama Micro Finance Institute (SMFI) in the South, are mostly used for the financing of non extension inputs. The credit for the extension packages (other than the household packages) are provided through cooperatives and/or the input supply desks in the OoARD

The credit services of the OCSI, the OMFI and SMFI for the non extension inputs are channeled to the individual farmers, who organize in groups to provide group

collateral to the institutions. Most of the credit services in this case are used for the purchase of both “extension” and “non-extension” inputs.

Credit supply by the MFI and others for inputs that are included in the household package extension program are given to individual farmers with out group collateral, for 2-4 years term, generally at lower interest rate than other credits. All other credit services are given either to farmer cooperatives who then distribute to members, or are given on group collateral basis. When credit is given on group collateral basis, several steps are followed. First farmers have to organize in credit groups. Several credit groups may also organize in to credit centers. Credit committees constituted at the PA level and chaired by the loan officer of the sub-branch office of micro finance institution (MFI) and includes PA officials screen credit requests of farmers. The sub-branch office of the MFI then approves credit requests upon further screening of the credit worthiness of the applicants. Overall, we found that the demand for credit is much lower than the supply.

5. Availability of input supply and credit services in the PLWs

Community survey was conducted to determine the availability of credit and input supply services in a peasant association (PA). About 47% of communities reported that they had credit service available in their PA, while 69% of communities reported that they had access to input supply service in their PAs. Of those who reported the lack of credit and input supply services in their PA, 41% and 91% of communities reported that they have access to credit service and input supply services, respectively, from sources outside their PA. These results indicate that while about 31% of communities had no access to credit services and only about 3.5% of communities did not have access to input supply service.

When disaggregated by region, all communities in the sample districts of Tigray region reported that they had access to input supply either in their PA or outside of their PA, with about 86% of communities having access to input supply service in their PAs. More than 96% of communities also reported that they had access to credit service either in their PA or from other locations. In the sample districts of the Amhara region, 76% and 80% of communities reported that they had access to credit and input supply services

in their PAs, respectively. Only 12% and 10% of communities reported they had no access to credit and input supply services, respectively.

All communities in the Ada'a Liben woreda of the Oromia region reported having access to the services either in their PAs or from outside sources. This high access to services in the woreda may be because of the availability and strength of the primary cooperatives and the union. Access to credit services seems to be low in the Southern region sample districts, although access to input supply is not a problem. Only 18% of communities reported having access to credit service in their PAs, and 56% reported having access to input supply in their PAs. More than 52% of communities in these woredas reported no access to credit services at all, while only 3.5% reported lack of access to input supply.

Farmers were also asked about their satisfaction with the input supply and credit services. Despite the reportedly high level of access to input supply and credit services, farmers response to whether they were satisfied with the services (i.e if the information they receive from the extension service regarding input supply and credit was actually useful to them) seems to tell a completely different story. Regarding teff, about 85% of surveyed households reported that they receive information about input supply from the extension service, but only 38% of them reported that the information supplied was useful to them. The case with wheat is similar, with 96% reporting receiving information on input supply, but only 58% responding positively about the usefulness of the information.

Similarly, despite high access to credit services, farmer satisfaction with the service the credit service was low. For example, for teff, while 65% of surveyed households reported having received information on credit services, only 38% of them responded positively about the usefulness of the service. The case with wheat was also similar, although better than for teff. While 95% of surveyed households received information about credit services for teff, only 57% found it useful.

Farmers were also asked whether they find the extension service responsive to their information needs on input supply and credit services (i.e. if the information they receive is the information they needed). Results are consistent with that of perceived farmers satisfaction on the information supply. Only about 40% and 54% of farmers

reported that the information they received on input supply from the extension service for teff and wheat, respectively, is according to their needs. With regard to credit information, 44% of farmers for teff, and 58% of farmers for wheat reported that information supplied is according to their needs.

Farmers cited several reasons for their lack of satisfaction with the input supply and credit services. The major reasons reported by farmers for their lack of satisfaction with the input supply service include shortage of supply of the required inputs, weak extension service, high cost of inputs and untimely information. With regard to credit services, farmers identified limited credit supply, high interest rate, high down payment requirements, and inadequate information as important problems.

The results of the analysis of perceived usefulness and responsiveness of information supplied by the extension service strongly suggests that there is a need to identify farmer needs and address them. According to farmers, the major problem that needs immediate attention is improving the supply of inputs and credit. Improving the extension service is another urgent concern of farmers. Part of the problem with the extension service could be the top-down and supply driven approach it follows, and the unnecessary focus on input supply and delivery, instead of on improving the knowledge and skill of farmers.

6. Commercial fertilizer and improved seed use in the study areas

Cereal crops grown in the study area include teff, maize, wheat, barley, sorghum, finger millet and rice. In this section we present results of descriptive analysis of use of commercial fertilizer and improved seeds in the study area in the 2004/05 cropping year. Farmers applied commercial fertilizer on more than 50% of teff and wheat fields. Only about 27% of maize and finger millet fields, 13% of barley fields, 6% of sorghum fields received commercial fertilizer during the cropping season. The use of commercial fertilizer on rice fields was rare (2.8%), apparently because of the moderately high soil fertility of the fields, and also due to fear of water pollution on rice fields, which is also used as drinking water for livestock.

When disaggregated by region, nearly 97% of teff fields in the Ada'a Liben woreda of the Oromia region were cultivated with fertilizer, followed by Dale and Alaba

woredas of the southern region (77%), and Fogera district of the Amhara region (19%). Fertilizer use on teff on the two sample woredas of Tigray is about 1%, because these woredas are basically drought prone and soil fertility is not a serious problem in one of the woredas (Alamata). With regard to use of improved teff seeds, despite the highest proportion of plots cultivated with fertilizer on teff plots in Ada'a Liben (Oromia), and the Southern region woredas, only 5.6% of fields in Ada'a Liben and 5% of fields in the South were cultivated with improved seeds. This is contrary to the usual assumption that farmers use fertilizer and improved seeds together.

Similarly, more than 95% of wheat fields in the Ada'a Liben woreda is cultivated with fertilizer, followed by 66% in the southern region woredas, 33% in Amhara, and 14% in Tigray. Regarding the use of improved wheat seeds, about 92% of fields in Ada'a Liben and about 57% of fields in the districts in Tigray, and 32% of fields in the southern region districts were cultivated with improved wheat varieties. The use of improved seeds for wheat seems to be much higher than that of teff.

In the Southern and Amhara region districts, where maize is an important food security crop, about 35% of fields in the Southern region and 26% of fields in the Amhara region were cultivated with improved maize varieties. Moreover, about 24% of fields in the Southern region districts, and only 10% of fields in Amhara were cultivated with improved varieties.

With regard to the rate of application of commercial fertilizer on cultivated fields, wheat has the highest application (91 kg/ha), followed by teff (77 kg/ha), maize (41 kg/ha) and finger millet (25 kg/ha). When we consider only those fields where fertilizer was applied, the average application rate was 167 kg/ha for wheat, 151 kg/ha for maize, 138 kg/ha for teff, and 95 kg/ha for finger millet.

Regarding the use of improved seeds across the sample districts, wheat was the first with improved seed used on 65% of cultivated plots, followed by maize (16%), and teff (8%). Use of improved seed for sorghum, barley and finger millet is very low (below 1% of plots), while about 3% of rice fields were sown with improved rice varieties.

7. Emerging innovations in agricultural input supply and delivery

Recent innovations in the input supply system (innovations in input delivery away from the OoARD) and associated credit services have been observed in the study areas. We summarize these innovations below.

7.1 Role of cooperatives

In the Ada'a Liben woreda, contrary to the past where the OoARD was the major input supplier, the multipurpose cooperatives distribute all fertilizers and improved seeds (wheat, chickpea, lentils and teff) of the "extension" packages to farmers upon down payment¹¹. The Cooperatives are also responsible for the collection of credit repayment from farmers, unlike in the past where DAs were responsible for the job. The procurement/production/supply of fertilizers and improved seeds to the woreda has also changed very recently. Fertilizers at present are directly imported by the Cooperative Union, instead of being delivered through companies. The Union has also become involved in the purchase of improved seeds (wheat, chickpeas) from farmers with the help of the OoARD. The seed grains are cleaned by the union and sold through the primary cooperatives. However, the demand for improved seeds remains much higher than the current supply, basically because of the limited supply by the ESE. Besides these "extension" inputs, the Union also sells limited quantities of agro chemicals, and farming equipment like the broad bed maker (BBM). In addition to distribution of inputs, the primary cooperatives are involved in the estimation of farmer input needs, assisted by the DAs, a function which in the past was the sole responsibility of the DAs. In 2006, the Union is planning to become involved in the supply of improved chickens.

In the Ada'a Liben woreda, a dairy cooperative known as the Ada'a Dairy Cooperative is also involved in the supply of dairy inputs including roughage feeds (grass hay and cereal straw), concentrate feeds (bran, oil seed cake, molasses, salt), and the provision of AI and veterinary services to dairy farmers. The sources of these feed are farmers, flour mills, sugar and oil processing plants, and from commercially established feed processing factories. The cooperative is planning to establish its own feed processing unit. It is interesting to note that the dairy cooperative has established AI service and presently charges Birr 10/insemination while the government AI services

¹¹ The down payment can be as high as 50% of the value of inputs.

charges Birr 2/insemination. The difference in the price is indicative of the need to liberalize input prices in order to encourage involvement and development of the private sector in input supply.

The gradual exit of the OoARD of the Ada'a Liben woreda from supplying the major crop inputs (fertilizer and improved seeds) and the transfer of the responsibility to the primary cooperatives and the union needs to be studied in detail in order to draw lessons to scale up the experience to other areas.

7.2 Contracting to commercial companies

An innovation has also been observed in the production and supply of improved chickens in Ethiopia. Whereas previously 12 week old pullets were produced in government managed multiplication centers and distributed to farmers on credit basis, most pullets are now produced on contract with commercial companies. (eg. Genesis Farm and ELFORA located in Ada'a Liben woreda). Interesting to note is that these firms are paid Birr 27.50/pullet instead of the Birr 12 which is normally charged for government produced pullets. Still, these companies do not sell directly to farmers and all "contracted" pullets are channeled through the OoARD and supply of chickens to the farmers is still short of demand. The chickens are supplied to farmers at subsidized price. This case is a good example of how the government can encourage the involvement and development of the private sector and still provide input to farmers at subsidized price, if it decided to do so.

Another innovation observed in the Alamata woreda of the Tigray was the supply to farmers of improved haricot bean seeds on contract farming arrangement with a South African company in 2003/04. However, experts and farmers reported that the contract farming did not succeed, suggesting the need to analyze the reasons of the failure of and draw lessons to pre-empt failures of future contractual farming arrangements.

7.3 The role of small scale private businesses

An innovation observed throughout the four regional states was the production and supply of farm equipment, especially improved beehives. The various government owned Rural Technology Centers (RTC) were originally expected to produce and supply

improved beehives for distribution to farmers. Soon after the program started, it was realized that the technology centers would not be able to supply the required number of beehives to the farming community. The idea of providing technical training to private manufacturers and sub-contracting the production of the equipment to them was initiated. The BoARD and the OoARD took the responsibility of quality control. As a result of the sub-contracting, the private manufacturers are producing the improved beehives according to the standards required by the OoARD and shortages were soon converted into surplus in all the regions.

Similarly, some regions and woredas (eg. Alamata woreda in Tigray) sub-contracted the production of other farm implements such as treadle pumps to private manufacturers who received training from the bureaus and offices. The production of improved energy saving stoves has also been similar.

A different innovation occurred in Fogera woreda with regard to the supply of vegetable seeds. Despite the high potential for irrigated vegetables (especially hot pepper and onion), production has been constrained by lack of seed supply. Cognizant of the situation, private businesses started to be involved in the production of vegetable seeds. The businesses sell the seeds to farmers on cash basis or enter in to sharecropping arrangement with farmers.

Farm households in different parts of the country are involved in household level water harvesting and irrigation development initiatives. One of the constraints farmers are facing in this regard is water lifting devices. Many of the farmers cannot afford to purchase irrigation pumps or would not find it profitable because of the lack of economies of scale. Accordingly, an innovation was observed in the supply of irrigation pumping services in the woredas of Atsbi (Tigray) and Fogera (Amhara). Private individuals purchased portable pumps and provided pumping services on cash basis to farmers to extract water from ponds, wells or rivers. It was reported that these operators charge pumping fee on hourly basis or enter in to sharecropping arrangements with farmers.

These experiences are practical examples of how the involvement of the private sector in agricultural input supply can help alleviate shortages and ensure sustainable supply. The experiences also indicate the need for business development support services

(eg. technical training, business and entrepreneurial training, and credit) to facilitate and encourage the involvement and development of the private sector in agricultural input supply.

Although the role of the private sector in the supply of inputs such as feed, agro-chemicals, veterinary drugs is still very low, signs are being observed of the emerging involvement of the private sector in the business. For example, in Alaba woreda a number of small agricultural input supply shops are apparent at the capital of the woreda. Also, in Metama, an input supply shop has been identified and linked to farmers for the supply of agro chemicals and veterinary drugs.. Similarly, in the Ada'a Liben woreda, some shops are found in the main urban centers which sell agro chemicals, fertilizers, veterinary drugs and fodder/concentrates. Some traders also sell seeds to farmers. Veterinary services are also provided by private individuals. A closer look at the constraints that these businesses are facing would help in developing interventions to improve the involvement of the private sector in the business and help alleviate the shortage of supply of agricultural inputs and services. In particular, the effect of the involvement of the public sector on the development of the private sector needs to be evaluated critically.

7.4 The role of farmers

That farmer to farmer input supply can be an important and sustainable input supply channel is exemplified by the farmer to farmer supply of local teff seeds in Ada'a woreda. Teff production in Ada'a woreda is market oriented. Although farmers mainly use local teff seed, seed is purchased from farmers who specialize in teff seed production. Due to the high rainfall and runoff problem in the woreda, several farmers have specialized in producing teff for seed on plots located at upper parts of watersheds and on good soils. The choice of plots located on upper parts of the watersheds ensures that teff sown for seed is not mixed (contaminated) with teff varieties sown on other plots due to runoff. Farmers reported that they are content with this farmer to farmer teff seed supply system, a result consistent with the fact that the farmer to farmer supply has been operating for several decades in the woreda. This practice is another important indication of the role of developing farmer to farmer seed supply systems, or the involvement of the private sector in input production and supply in order to alleviate the shortage of inputs in

rural Ethiopia. Interesting to note is that, in this free market environment, farmers were prepared to pay up to 50% more for the “seed” teff as compared to grain teff.

Another interesting case of farmer to farmer input supply was observed in Alamata woreda, Tigray region. The woreda has a high potential of tropical fruit production. Despite the potential, however, lack of seedlings planting materials supply had left the production of fruit crops completely underdeveloped. In order to fill this gap, there are emerging signs of farmer to farmer supply of seedlings and planting materials in the woreda. We observed that technical training and other business development support services is crucial in this regard. Moreover, the threat of competition by the OoARD that supplies seedlings at subsidized prices to farmers needs to be reconsidered. One approach could be for the OoARD to buy the planting materials from the private nurseries at market prices, and distribute to farmers at subsidized prices, if the objective is to subsidize farmers. This way, the private sector could be encouraged to develop.

Dale woreda is one of the important coffee producing woredas in the country. An interesting innovation was observed in this woreda with regard to the production and supply of coffee seedlings. The production and supply of these seedlings was originally organized by the OoARD in central government managed nurseries. However, in recent years, more than 80% of the production takes place in private nurseries owned by farmers and primary cooperatives. Seedlings from government nurseries are normally sold at Birr 0.16/seedling. Initially private nurseries produced seedlings on contract basis to the OoARD who purchased the seedlings at Birr 0.20 and sold them to farmers at Birr 0.16. Since a few years, farmers started selling seedlings directly to buyers. Prices now reportedly fluctuate depending on the coffee price (responding to market forces) and the weather. For example, in 2004/05, prices ranged from Birr 0.50 to 1/seedling.

The Metema woreda in the Amhara region is another area with unutilized high tropical fruit and vegetable production potential. However, due to lack of the supply of seedlings and planting materials, and weak extension service fruits and vegetables production remains completely underdeveloped. Based on PRA and series of consultations with farmers and agricultural experts of the woreda, the IPMS project, as part of its approach of community resources based agricultural extension service, introduced dwarf Cavendish bananas in the PLW to private farmers. After about eight

months, the first-round plantations are supplying banana to market. Based on the success of the first round plantations, farmer demand for banana suckers and other fruit crops planting materials and seedlings is increasing. The interesting outcome of this development is that the farmers who adopted the banana technology are now suppliers of suckers to other farmers.

7.5 Innovations in credit supply

Credit supply in Ethiopia is closely related with the use of improved agricultural inputs, owing to the poverty level and liquidity constraints farmers are facing. An interesting phenomena was observed in the PLWs in Tigray region with regard to credit service. In these woredas, farmers are provided with credit coupons to buy inputs. Credit coupons issued by the Dedebit Credit and Saving Institution (DCSI) are used for the purchase of improved seeds, treadle pumps, improved beehives, and improved poultry. Currently, the coupons indicate the supplier of the particular input the credit coupon is issued for. However, if farmers had the choice of suppliers to buy inputs from, the use of credit coupons could contribute to improve the competitiveness of the input market, compared to supplying input on in-kind credit. Another innovation regarding credit supply was also observed in Dale woreda by the Sidama Micro Finance Institution (SMFI). The SMFI requires borrowers to pay 1% of the principal as insurance fee against the death of the borrower. In case a borrower dies, the family members are not held responsible to pay the debt.

8. Conclusions and recommendations

The public sector in Ethiopia is heavily involved in the supply and distribution of agricultural inputs. The *woreda* OoARD (through its DAs) is involved in the demand estimation of inputs and distribution of same to farmers. Generally, the input supply system is characterized by demand outstripping supply, especially for improved seeds, seedlings and planting materials, and livestock inputs.

The series of proclamations and regulations issued by the government of Ethiopia since 1991 made explicit recognition of the role of the private sector in agricultural input

supply and the need to create conducive environment for the private sector to engage in the business. However, the role of the private sector in the input market remains limited. In almost all regions, competition had not reached all the way down to the woreda level. Inadequately competitive input market discourages entry into the business and limits investment in market infrastructure. In this regard, the key lesson for Ethiopia (and indeed the whole of sub-Saharan Africa) from the Asian Green Revolution is the fact that private sector involvement was consistently encouraged during the process of the green revolution (Djurfeldt, 2006), in contrast to many SSA countries where private sector involvement was constrained, or in extreme cases eliminated.

Part of the reason for the slow development of the private sector in the input market in Ethiopia is the lack of institutional strategies that complement reform policies. Institutions that foster competitive environment are vital for the development of efficient input markets. The input credit system that eliminates competition is a good case in point. In addition, fear of public officials that the private sector is not trust worthy, concerns about the effect of reform programs on the rural population, subsidies driving the private sector out of business, state mentality of guardianship of development are all important factors that constrain the development of the private input supply sector.

Government lack of confidence on the private sector usually results in a vicious circle of justifying public involvement in markets thus reducing the incentive and confidence of the private sector, resulting in further justification for government entry (Jayne et al. 2002, Djurfeldt et al. 2006). Subsidies to farmers may need to be handled in such a way that does not go against the private sector. The lack of business development support services (eg. technical and business training, credit supply) is another reason that deserves attention.

On the demand side, improving the effectiveness of the extension service and expanding credit supply could increase farmer willingness to use modern inputs. Infrastructural development, such as roads and irrigation structures, could increase the profitability of farming thus stimulating input demand. Part of the problem with the extension service that deserves immediate attention is the top-down and supply driven approach it follows, and the unnecessary focus on input supply and delivery, instead of on improving the knowledge and skill of farmers (Gebremedhin et al. 2006).

The innovations in input supplied identified in the study *woredas* offer practical examples of how the involvement of the private sector in agricultural input supply can help alleviate shortages and ensure sustainable supply. The experiences in the development of these innovations needs to be studied in greater detail in order to draw lessons for scaling out and up to wider areas. In this regard, we recommend to:

- Study/monitor the identified innovations and other innovations in input supply and rural finance in more detail. Particular attention needs to be paid to the effect these innovations have on reducing the role of the OoARD in the supply of inputs and credit as well as increasing the role of the private sector (including cooperatives) in the supply of inputs. Relieving the OoARD from input supply would allow DAs and experts to focus more on information and knowledge transfer, and in facilitating linkages of farmers with institutional services, including the input supply service itself.
- Share experiences on the innovations on input and credit supply between regions and PLSs, including linkages between micro finance institutions and the activities of the OoARD.
- Stimulate the introduction of promising input and credit supply innovations through a participatory process with key stakeholders.

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Annex 1: Brief description of the IPMS project and its objectives

IPMS is a five-year project funded by the Canadian International Development Agency (CIDA) and implemented by International Livestock Research Institute (ILRI) on behalf of the Ethiopian Ministry of Agriculture and Rural Development (MoARD). Following the Government of Ethiopia's rural development and food security strategy, the IPMS Ethiopian Farmers project aims at contributing to improved agricultural productivity and production through market-oriented agricultural development, as a means for achieving improved and sustainable livelihoods for the rural population.

To achieve this goal the project has four main objectives:

- To develop an agricultural knowledge management system that will enable Ethiopian institutions, farmers and pastoralists to adopt appropriate technologies from research and development institutions based in Ethiopia and elsewhere;
- To build and strengthen existing public agricultural institutional capacity and foster institutional learning and change so that new collaborative arrangements across sectors and levels are developed to better support the dissemination, use and impact of demand-driven sustainable agricultural technologies and information;
- To increase the capacity of farmers, pastoralists, community-based organizations, and private organizations to improve agricultural productivity and production, and to improve and sustain livelihoods;
- To develop recommendations, policy options and strategies to enhance the impact of public policies and programs.

The project strategy is to introduce/strengthen and adapt innovative technologies and practices for priority crop and livestock commodities in Pilot Learning Woredas in conjunction with innovative private sector marketing, input supply and credit arrangements. Such innovations will be introduced and developed on the basis of the potentials of the "market" and the needs and capacities of farmers, including female headed households in the PLW.

