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# Transaction Costs on the Ethiopian Formal Seed Market and Innovations for Encouraging Private Sector Investments

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## Abstract

There is a considerable shortage of improved seed in Ethiopia. Despite good reasons to invest in this market, private sector investments are not observed. Using an institutional economics theoretical framework, this paper analyzes the formal Ethiopian seed system and identifies transaction costs to find potential starting points for institutional innovations. Analyzing data from more than 60 expert interviews conducted in Ethiopia mainly in 2012, it appears that transaction costs are high along the whole seed value chain and mainly born by the government as public organizations dominate the Ethiopian seed system, leaving little room for the private sector. However, direct marketing pilots that have been started recently are a signal of careful market liberalization efforts.

**Keywords:** agriculture, Ethiopia, institutions, private sector, transaction costs

**JEL:** Q13, Q18

## 1 Introduction

About 80% of the Ethiopian population depend as smallholder farmers on agriculture for their livelihoods (CSA, 2012). These smallholders suffer from a very low productivity (see e.g. SEYOU M TAFESSE et al., 2011). To increase productivity, improved inputs like seed, fertilizer and better farming practices are crucial (see e.g. VON BRAUN et al., 1992; CONWAY, 2012).

Despite the presence of several seed companies, the agricultural input sector in Ethiopia is currently not able to satisfy the demand for improved seed in the country (MOA, 2013). However, there are several reasons to invest in Ethiopian agricultural input markets: not only is the market large in terms of the number of people, high rates of economic growth and investments in infrastructure indicate a huge potential especially in the middle and long run. Furthermore, in the last two decades innovative business approaches have emerged that add social additional to financial returns to a company's bottom line and thus augment the reasons for companies to invest in poor countries and poor people (BAUMÜLLER et al., 2013; BAUMÜLLER et al., 2011).

Empirical studies suggest that the current situation on Ethiopian agricultural input markets is not the efficient outcome of demand and supply meeting at a certain price but that institutions drive up transaction costs, i.e. the “costs of coordinating resources through market arrangements” (DEMSETZ, 1995: 4), leading to insufficient supply of and unmet demand for agricultural inputs (ALEMU, 2010, 2011; BISHAW et al., 2008; LOUWAARS, 2010; SPIELMAN et al., 2011). From an allocation theoretical perspective, this situation is a market failure since the lack of supply of agricultural inputs at current prices implies welfare outcomes below an achievable optimum. Thus, the current lack of inputs can be defined as a market failure in this sense (see ARROW, 1969, or BATOR, 1958, for detailed discussions of this argument).

Market failures are a result of high transaction costs. Transaction costs, however, are determined by the institutional structure of an economy (NORTH, 1989). NORTH (1990) defines institutions as “the rules of the game in a society, or more formally, [as] the humanly devised constraints that shape human interaction” (NORTH, 1990: 3).

The free market cannot serve as fictive first best option whose approximation can guide the design of an institutional setting since transaction costs drive a wedge between producer and consumer prices such that even in theory ‘free markets’ do not lead to Pareto efficient results when transaction costs are taken into account (ARROW, 1969; DEMSETZ, 1969). Thus, a comparative approach evaluating real alternative institutional arrangements based on the identification of the relevant transaction costs that determine economic performance is appropriate to study transaction costs and the functioning of markets (WILLIAMSON, 1980; DEMSETZ, 1969; ACEMOGLU and ROBINSON, 2012).

Against this background, an analysis of the institutional setting and the transaction costs arising on agricultural input markets is carried out to get a better understanding of the reasons for the observed market failure and to assess possible solutions for these frictions. Only if these costs are reduced, there is a chance that the private sector can expand activities to make improved seed also accessible to the poor.

Transaction cost economics has been applied to study many different problems of economic organization. MASTEN (2001) stresses the importance of transaction cost economics for the analysis of agricultural markets and policy as well as vice versa the potential the analysis of agricultural markets has to refine transaction cost theory (see also KHERALLAH and KIRSTEN, 2002).

Transaction costs are generally found to be high on agricultural markets in poor countries and have a considerable influence on farmers’ marketing decisions. Several studies show that transaction costs are closely related to distance and that distance from markets negatively influences market participation and thus incomes (ALENE et

al., 2008; DE BRUYN et al., 2001; HOLLOWAY et al., 2000; KYEYAMWA et al., 2008; MALTSOGLU and TANYERI-ABUR, 2005; OUMA et al., 2010; RUJIS et al., 2004; SOMDA et al., 2005; STAAL et al., 1997; STIFEL et al., 2003). More specifically, STAAL et al. (1997) find that transaction costs raise more than proportionally to transportation costs due to factors like increasing costs of information and risk of spoilage of agricultural products. Furthermore, costs of information and search are found to impact smallholders' marketing decisions (GABRE-MADHIN, 2001; STAAL et al., 1997; DE BRUYN et al., 2001; DE SILVA and RATNADIWAKARA, 2008; KYEYAMWA et al., 2008; KEY et al., 2000; MALTSOGLU and TANYERI-ABUR, 2005).

However, HOLLOWAY et al. (2000) and STAAL et al. (1997) find a positive effect of organizations of collective action, such as cooperatives, in reducing transaction costs. These benefits accrue to both producers and buyers as cooperatives reduce the costs of information for both sides and take advantage of economies of scales in collection and transport.

Less is known about transaction costs arising on the side of the private sector when companies try to market to poor smallholders. Recent studies starting to analyze constraints for companies entering agricultural markets in poor countries remain vague but indicate that “(a) laws, policies or regulations that constrain business operations; (b) government capacity to respond quickly; and (c) access to capital” are the main hurdles named by the private sector to realize investments in African agriculture (NEW ALLIANCE FOR FOOD SECURITY & NUTRITION, 2013: 6).

Against this background, this paper starts to fill this knowledge gap by analyzing the institutional setting and the resulting transaction costs that arise when selling improved seed to poor farmers in Ethiopia. Results show that the formal Ethiopian seed system is largely controlled by the government and public organizations. Based on the control of breeder seed the government forces seed companies to market all seed through one government-controlled distribution channel, at prices determined by the government. This limits profit margins and incentives to expand seed production. The only exception to this system are the international seed companies that operate in Ethiopia as these produce their own varieties and are thus not dependent on the breeder seed provided by the public research institutes. Thus, especially the government bears high transaction costs to sustain a system that does not lead to satisfactory outcomes. However, direct marketing pilots have been started that allow Ethiopian seed companies to market their seed directly to farmers for the first time, which may indicate a first step towards market liberalization.

The remainder of the paper is structured as follows: Section 2 shortly describes data and method used. Section 3 introduces the problem of insufficient production of

certified seed in Ethiopia. Section 4 analyses the reasons for the shortage of certified seeds and identifies relevant institutions and transaction costs preventing further investments in seed production. Section 5 presents recent institutional changes in Ethiopia that may create new incentives for the private sector to invest in seed production and section 6 concludes.

## **2 Data and Method**

The study uses primary data obtained through 65 expert interviews that were conducted by the author in Ethiopia in 2011, 2012 and 2013. These interviews are analyzed concerning the importance of different types of transaction costs in providing incentives and disincentives to expand seed production. To ensure anonymity to the informants, only the stakeholder group of the informant is provided in the text in square brackets. Thus, if one or more experts from a stakeholder group provided an information, this is indicated in the following way of citation: [1] manager of an international seed company; [2] manager of a private Ethiopian seed company; [3] manager of a public Ethiopian seed company; [4] member of a farmer organization; [5] government employee; [6] employee of a public research organization; [7] employee of another organization (banks, Agricultural Transformation Agency, etc.).

## **3 Seed Production in Ethiopia**

In the following, only the case of seeds of major crops is discussed. These major crops are 18 crops selected by the Ethiopian government: teff, barley, wheat, maize, sorghum, finger millet, rice, faba bean, field pea, haricot bean, chickpea, lentil, soybean, niger seed, linseed, groundnut, sesame and mustard. Institutions differ for other seeds such as fruit and vegetable seed and for other agricultural inputs like fertilizer or agro-chemicals. However, due to space limitations, only the case of the 18 major crops is discussed in the following.

Only 2.9% of the farmers in Ethiopia reported to use improved seed in 2011 (CSA and MOFED, 2011: 20). The contribution of the formal seed sector as a percentage of cultivated land was only 5.4% in 2011, with considerable variability among different crops (SPIELMAN et al., 2011). Low technology adoption rates can have many reasons (DEGU et al., 2000; FEDER and UMALI, 1993). In Ethiopia, one important reason is the substantial lack of improved seed (see MOA, 2013).

In 2011/12, seed supply covered only 51% of stated demand for barley, 24% for wheat, 16% for rice, 30% for millet and 60% for faba bean (see TABLE 1). The supply of maize, wheat and teff seeds has improved considerably over the last years. But still,

only 20% of the area cultivated with maize, 4% of the wheat area and less than 1% of the teff area are cultivated with seed from the formal sector (CSA, 2012).

**Table 1. Difference between supply and demand of improved seed of various crops**

	Difference btw demand and supply in quintals (2011/12)	% of demand not met
Wheat	200,720	21
Teff	10,211	11
Maize	39,666	9
Barley	101,924	49
Sorghum	16,433	92
Rice	13,638	84
Millet	967	70
Faba bean	19,918	40
Field pea	47,769	84
Chick pea	11,035	63

Source: MOA (2013)

In the Ethiopian case, it is important to distinguish different types of seed companies. Generally, in this paper, a private seed company is understood as a firm with a business and a seed producing license, producing seed on its own account and bearing the full risk of the business. Thus, cooperative unions or farmers employed as seed producers by seed companies or other organizations such as non-governmental organizations (NGOs) do now fall into this category. However, this does not imply that seed companies produce all their seed themselves, companies can also hire farmers to produce the seed on their behalf.

For the following analysis, it is helpful to differentiate between public seed enterprises, private Ethiopian seed enterprises and international (private) seed enterprises. There are five public seed companies in Ethiopia: the Ethiopian Seed Enterprise (ESE), the Amhara Seed Enterprise (ASE), the Oromia Seed Enterprise (OSE), the South Seed Enterprise (SSE) and the Somali Seed Enterprise. The ESE was the only seed company in the country for several decades before some private seed companies entered the market. The regional public seed enterprises were established recently, starting with ASE and OSE in 2009. Their statutes foresee them to produce different kind of seeds for Ethiopian farmers while profit making is not a primary goal (AMHARA REGIONAL STATE, 2008).

The number of private Ethiopian seed enterprises is not clear. In 2004, 26 firms were licensed to produce seed but only eight firms were active in seed production (BYERLEE et al., 2007). Other sources mention 33 seed producing companies but without specifying who they are (ATILAW and KORBU, 2012). In 2011, 16 private seed enterprises were listed in the business directory but it is not clear whether they were all operating at that time.

Two international seed enterprises are producing some of the selected major crops (as at July 2013), Hi-Bred Pioneer and Seed Co. Both focus on the production of hybrid maize, while one of them also produces smaller quantities of wheat, teff and beans ([1]).

#### **4 Why is there not more Investment in Seed Production?**

If the stated demand is much higher than seed production, the question arises what prevents private seed companies from increasing investments in seed production to tap this market? The answer to this question lies in the institutional setting governing seed production and distribution in Ethiopia.

As illustrated in Figure 1, the Ethiopian seed system is quite complex. The process of seed production starts with an assessment of seed demand, which is carried out by the Development Agents (DAs) on *kebele* (village) level. Information on seed demand is then passed upwards the government administration ladder and collected by the Bureaus of Agriculture (BoA) and the Ministry of Agriculture (MoA). On this information basis the MoA orders the quantities of production of various crops at the ESE, the BoAs determine production portfolios of the regional public seed enterprises and the private seed companies in the area.

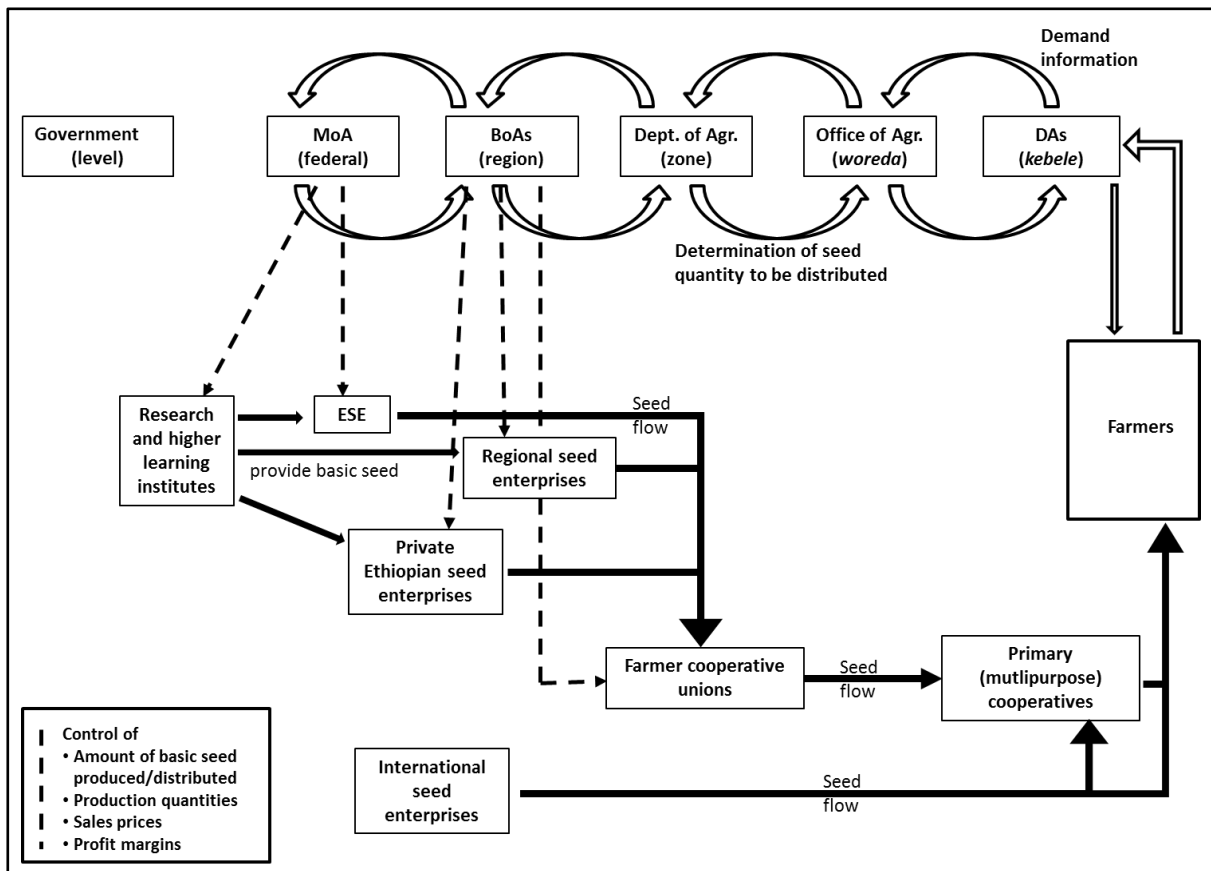
All Ethiopian seed companies – public and private – get their pre-basic and basic seed from public research institutes (see also Figure 1). Only the two international seed companies operate with own varieties. This is of great importance because getting pre-basic seed from national research institutes comes with a contract entailing a clause that obliges the companies to sell all produced seed back to the government – at prices to be determined by the government and often announced on short notice.

The MoA determines the quantities of seed to be distributed to each region on the basis of the demand assessment; the BoAs define the quantities for each zone and so forth. Seed distribution is usually managed by farmer cooperative unions who bring the seed to the zones and the primary (multipurpose) cooperatives that pick the seed up in the zonal warehouses and bring it to the *woredas* (districts) and *kebeles*. Unions charge for transport, uploading and unloading but they make only small profits with

seed distribution, with profit margins being determined by the regional governments ([3]; [4]).

An important implication of this seed system is the lack of agro-dealers as seed distribution is organized in one government-controlled distribution channel. This has important implications also for other agro-dealers as it makes it extremely difficult and expensive for them to market agricultural inputs outside larger agglomerations.

**Figure 1. The formal seed system in Ethiopia**



Source: author

The private seed enterprises in Ethiopia mainly focus on hybrid maize production because it offers the highest profit margins. For this reason, supply of hybrid maize seeds has improved considerably since the regional seed enterprises started operations, from 88,000 quintals in 2006/7 to 357,000 quintals in 2010/11 (1 quintal = 100kg) (DALBERG GLOBAL DEVELOPMENT ADVISORS, 2012). Private companies produce now about 40% of the hybrid maize seed sold in the country (ALEMU, 2011).



Some companies also produce varieties of wheat, teff, beans, rice, soybean, sesame and sorghum. But all crops except hybrid maize are only produced in very small quantities despite large cultivation areas. Thus, also for these crops, there are large untapped markets where demand is substantially higher than supply (see MOA, 2013). However, with the limited size of land for seed production, companies focus on the production of the seed with the highest profit margin as long as there is demand for that seed.

#### **4.1 Institutions Preventing the Private Sector from Increasing Seed Production**

Various institutions in the current seed system prevent private seed companies from increasing seed production and from making it available to smallholders. Important constraints for the private Ethiopian seed enterprises result out of the fact that none of them has its own breeding program. Some managers express the intent to import new parental lines for own breeding efforts to escape the strict government interference. However, breeding is a difficult business that requires additional land and high-skilled and experienced plant breeders as well as technical facilities. Accordingly, seed producers need to get more land assigned by the government to start own breeding, which takes a long time and is insecure. Additionally, it is difficult to hire experienced plant breeders in Ethiopia because currently plant breeders are government employees enjoying secure jobs and other privileges. This problem is aggravated by the fact that areas dedicated to plant breeding will be in remote areas because breeding requires isolated land plots. These circumstances oblige companies to pay high salaries to plant breeders since skilled people often do not want to live in remote areas. Thus, it is difficult to attract them to private companies ([2]). Moreover, the installation of the necessary technical facilities requires additional working capital, which is difficult to get.

On the other hand, several experts assume that some seed enterprises are quite content with the present form of the contracts because they minimize risks as long as the government commits itself to buy all produced seed ([7]).

Another institution disadvantaging private Ethiopian seed companies is related to the distribution of seed. Farmers can select the varieties they want to purchase but they are usually not given the choice to opt for one particular source. It even often happens that the farmer cooperative unions or the primary cooperatives mix seed or refill it into other bags to make transportation easier, which confuses farmers about the quality of seed of different producers ([2]). Two problems arise as a result: first, this disables companies to establish a brand name, and second it blocks complaints by farmers about seed quality because the producer of the seed is not clearly identifiable.

Price determination is another point posing major difficulties for the private Ethiopian seed companies. Compared to other Sub-Saharan African countries the seed prices determined by the government are relatively low in Ethiopia. At first glance, this seems to be beneficial for the farmers but has also considerable disadvantages concerning users' efficiency (ALEMU, 2010: 24) and can lead to a crowding out of the private sector ([2]). The prices of major crop seeds are negotiated by the BoAs, the board and the management of the public seed enterprises. These prices are then binding maximum prices for the seed of all Ethiopian seed enterprises. Prices are based on estimations about farmers' willingness to pay for seed but there is no systematic assessment about farmers' willingness or ability to pay (ALEMU, 2010). Prices vary considerably across regions and from year to year. In 2011, e.g., hybrid maize BH-540 was sold at 2,000 Ethiopian Birr (ETB) per quintal in Oromia while in Amhara the price was 1,500 ETB per quintal ([2]; [3]). In the 2010-11 cropping season Pioneer Hi-Bred sold its hybrid maize at 2,784 ETB per quintal and sold all its stock ([1]).

#### **4.2 What is the Nature of Transaction Costs Arising in the Ethiopian Seed System?**

Although it is not possible to quantify transaction costs resulting out of the presented institutions in the seed system since neither the companies nor the government keep detailed records of their costs, the nature of the transaction costs involved and the distribution of these costs can be identified.

Costs for market entry have not been high in the past. Until now it was not difficult for private companies to start a seed business. Business owners need (1) an investment license, (2) a competence license and (3) a business license if they produce the seed on their own land. If the company does not operate on its own land but hires farmers to produce the seed it does not need the business license. Requirements to get the licenses are clear and the application procedure usually takes only a few weeks ([2]). However, private sector stakeholders fear that procedures become more tiresome and lengthy as the government might want to suppress additional competition for the regional public seed enterprises ([2]).

International seed enterprises that operate with their own varieties face very high transaction costs for market entry ([1]). Bureaucratic procedures are unclear and lengthy. New varieties that are brought to the country need to get registered in a procedure that usually takes three to four years ([1]; DALBERG GLOBAL DEVELOPMENT ADVISORS, 2012).

Costs for market information and pricing are moderate since demand is still very high for improved seed of all crops. For international seed companies marketing their own

varieties, considerable costs arise for promotion activities since it takes several years to gain the farmers' confidence in a new brand. Many field days, demonstration plots and gratis seed packages are needed to convince farmers of the benefits of improved seed ([1]).

For Ethiopian seed enterprises pre-contractual activities are organized by the government. Although there is no law or regulation fixing it, a *de facto* monopoly of the public research institutes implies a monopsony for seed as the government obliges the seed companies to sell all seed back to it. The government is then responsible for the marketing of the seed. In terms of transaction costs this means that for the companies, costs for search for customers and costs for information about the market do not arise because their product portfolio is largely determined by the government and they have to sell the produced seed to the government. This is changing with the direct seed marketing pilots (see next section) where companies are responsible for the demand assessment themselves.

Advertisement costs do not arise for Ethiopian seed companies since marketing is done by the government with the help of farmers' cooperatives and farmers cannot choose the source of their seed.

For the government pre-contractual transaction costs are considerable. Government employees spend much time to collect data about seed demand and to distribute seed. The typical time the head of extension in a *woreda* spends on collecting seed demand per season is one month, i.e. two months a year for both cropping seasons, and 45 days on distributing seed to the farmers ([5]). In the regional BoA of Southern National, Nationalities and Peoples' Region (SNNP), e.g., five full-time employees are charged with organizing seed supply and distribution ([5]). Additionally, employees in the zonal departments of agriculture and in the MoA are involved but it is not clear how many people dedicate their working time to seed distribution there.

Contract formation (bargaining) is similarly simplified for companies since the prices of major crop seed are negotiated by the BoA, the board and the management of the public seed enterprises. Since government regulations avoid direct contact and contracts between seed companies and farmers, there is no room for negotiations between customers and companies about prices or other parts of the contract ([2]).

The post-contractual transaction activities of contract execution, control, and enforcement are also minimized for seed companies by the actual government regulation. The theory of self-enforcing agreements (FURUBOTN and RICHTER, 2005) ceases to be valid since the seller of the seed is not the producer and complaints are usually not transferred back to the producer. The farmer cannot retaliate by stopping to purchase the product if the product turns out to be of bad quality because, first, he cannot

identify the producer and secondly, because he cannot choose between different producers such that the only alternative is not to buy improved seed at all.

As a result, it appears that in the current situation transaction costs are mainly born by the government. Governmental agencies assess demand and organize distribution of seed, public banks finance the time elapse between seed delivery of the seed enterprises and payments of the farmers. Promotional activities are done by the DAs, if at all. These transaction costs are very high and are not justified by satisfying outcomes in terms of quantities of seed produced, seed quality and timeliness of delivery.

Rather, the system has considerable disadvantages: cooperatives have to carry the burden of transporting seed, which keeps them away from other tasks such as trainings for farmers or output marketing on which they should actually focus ([7]). The current distribution network is also the reason for the lack of agro-dealers in the country, which is detrimental for the international seed companies and for other traders of agricultural inputs.

## 5 The Direct Seed Marketing Pilots

Increased pressure from private seed companies and other stakeholders led to the first trials, in which Ethiopian seed companies could directly sell their seed to farmers. Starting in Amhara region in 2011 and followed by Oromia and SNNP in 2012, Ethiopian seed companies were allowed for the first time to directly market their seed. These pilots have been scaled up in 2013. While in Amhara and Oromia the direct seed marketing was restricted to hybrid maize, also other varieties such as wheat could be directly marketed in five *woredas* in SNNP.

Preliminary results of the Amhara pilot suggest that seed availability and timely delivery was better in project *woredas* than in non-project *woredas* (ASTATIKE et al., 2012). The pilot also revealed that demand estimations for the pilot *woredas* were quite inaccurate. The project was not reiterated in Amhara in 2012 since the ASE was left with a lot of unsold seed that the government decided to sell preferentially in 2012 in the framework of the normal seed distribution system.

Concerning the 2012 direct seed marketing pilot in Oromia and SNNP, preliminary results indicate that all companies were able to sell almost all their seed. Participating companies in both regions even felt that they could have sold more seed if they would have had better demand information and fewer difficulties with transportation and storage in the *woredas* ([2]; BENSON et al., 2014).

Still, in all *woredas* more improved seed was sold than in any other year before and more than was initially foreseen (ISSD, 2013). This might have various reasons. First, shops of agro-dealers were open seven days a week and during the whole day while the cooperatives distributing the seed usually only open for two afternoons a week due to the lack of full-time employees. Secondly, seed was available on time before planting and until planting was finished. Thus, previously well-known problems of late arrivals of seed were avoided. Third, agro-dealers are said to provide good technical advice to farmers. This, together with some promotion by the companies might have increased awareness and trust in the seed. Finally, some farmers reported that they also bought seed for their relatives living in neighboring *woredas* who saw the benefits of early seed arrival and technical advice by the agro-dealers ([2]; [5]).

The main benefits of the pilots can be summarized as:

- Traceability of the seed and thus increased accountability for seed quality, which increases farmers' trust;
- Saved time resources of DAs and Subject Matter Specialists who were occupied with seed distribution previously and can now concentrate on training and advisory services for farmers;
- Farmers do not hold DAs responsible for seed failure since seed distribution is now managed by agro-dealers, which considerably improves the relationship between DAs and farmers;
- Companies are rewarded for better quality and have thus an incentive to improve on quality in the future;
- There is less seed fraud and storage damage as the value chain is much shorter.

The direct seed marketing trials can be seen as an important step towards market liberalization. However, the stop of the pilot in Amhara shows how fragile such changes are. Improvements in the methodology and careful evaluations of the project will be needed to smooth the way towards market liberalization for companies as well as for farmers.

Despite the generally very positive experience with the recent direct seed marketing pilots, some difficulties remain. Especially crucial points are the costs for transportation and agro-dealers. In 2012, sales prices were determined by the government and companies were not allowed to add up transportation costs and agro-dealer commissions despite considerable expenses for long ways of transport, which drove their profit margins towards zero or even below that. These problems led some companies to step out of the process. Other challenges are the lack of storage facilities in the *woredas* and a lack of trained agro-dealers.

## 6 Conclusions and Policy Recommendations

There is high demand for improved seed in Ethiopia. The question in the case of Ethiopia is how the private sector can participate in the government-dominated system that is not able to produce enough seed to meet the demand in the country. Control of breeder seed together with high costs of finance for private companies have been identified as the main instruments of the government to control seed production, distribution and price setting, which hampers investments and the development of business strategies of Ethiopian seed enterprises. Since all Ethiopian seed companies, public and private ones, are dependent on public research institutions for the supply of breeder seed, they are obliged to comply with the conditions that come with the provision of the breeder seed, i.e. the sale of all produced seed to the government at prices that are determined by the government. The seed is then distributed by cooperative unions and primary cooperatives on behalf of the government. The singular distribution channel often leads to seed being mixed up along the value chain and implies that farmers can choose the variety they want to plant but not the producer of the seed, which again bereaves them of holding seed producers accountable if the seed fails. The flip side is that seed producers have no incentive to improve on seed quality as better quality is not rewarded since prices are the same for all producers and low quality cannot be penalized.

The two international seed enterprises do not suffer from these constraints since they operate with their own varieties and are thus not subject to the restrictions related to the provision of breeder seed from public institutions. These international seed companies seem to be very successful and do not face problems in seed marketing despite their considerably higher prices.

It can be doubted that the relation between the sum of transaction costs and outcomes in terms of efficiency of seed production and distribution is optimal in the Ethiopian system. Of course, it is difficult to evaluate efficiency without a counterfactual. Yet, the analysis of the seed system reveals that institutions do not govern the seed market in an optimal manner: despite the high investments of time and other resources, inaccuracies in the demand assessments regularly lead to deficient outcomes that distort optimal seed production and distribution. High costs of capital and other burdens imposed by the government prevent Ethiopian seed companies from investing in own breeding which could improve the availability of high-quality seed in the country. Incentives for optimizing seed quality are distorted since farmers cannot identify the source of their seed and prices are independent from quality.

Thus, access to pre-basic and basic seed and support for own breeding efforts, which would include the assignment of appropriate land plots and the availability of plant

breeders as well as access to finance at reasonable costs combined with price incentives could considerably improve incentives for private seed companies to increase production and thus ameliorate the seed shortage in the country. The direct seed marketing pilots show that the government has recognized the need for change and may slowly deregulate the market.

To ensure supply of improved seed of all crops contributions of the private sector will be needed. Even if the new regional seed enterprises expand and optimize their production over the next years, it is unlikely that they can satisfy the seed demand of all farmers in the country. This is also acknowledged by the government (WORLD ECONOMIC FORUM, 2012).

In the current system, there is no strong incentive for many seed producers to start to make themselves more independent from the government. It is uncertain (for some even unlikely) whether their profits would increase much but business would become much riskier.

To incentivize domestic as well as foreign investments, a well-designed and stepwise market liberalization is needed. Incremental institutional changes are required that provide incentives for the private sector to increase seed production and diversity in the product portfolio and to improve seed quality. Yet, the costs of such changes in terms of welfare losses of other stakeholders must be carefully evaluated. Some concrete innovations that are most likely to increase incentives for the private sector and result in better input supply for farmers in the middle- and long run are discussed in the following.

A central aspect for Ethiopian seed companies is that they need access to basic and pre-basic seeds of the varieties and in the quantities of their choice and market it in areas and at prices according to their firm strategy. Since public seed companies are not obliged to make profits according to their statutes, these enterprises can ensure that even the poor have access to improved seed in case the private companies develop strategies that focus on other market segments.

Microfinance institutions (MFIs) or farmer cooperatives need to provide credits to the farmers. Without a credit facility, a rise in seed production will hardly benefit the majority of the peasants. MFIs are already serving many farmers but are still far from being omnipresent. Therefore, an extended coverage is needed to backup the want for improved inputs with purchasing power. The extension of coverage, however, needs to be accompanied by lending methodologies that ensure repayments to avoid the high default rates that have eroded the credit system in the past.

Not only for the farmers but also for the seed companies access to credit is a decisive factor if they are to increase seed production and the diversity of varieties. Collateral requirements and costs for negotiations with the banks need to be lowered such that seed companies have a realistic chance of accessing finance at reasonable costs.

Another fundamental precondition for a more vibrant private sector is the assignment of more land for seed production and breeding efforts. Yet, more seed production and especially own breeding efforts that would free Ethiopian companies from most government control along the value chain also require high-skilled plant breeders. The education of such people is a long-term task that needs to be taken care of by the government in the form of support for universities and higher learning institutes.

Additional to these ‘enabling changes’, it seems adequate to abolish the security for private seed enterprises that all produced seed is bought by the government. As long as seed companies do not need to use entrepreneurial spirit and design competitive firm strategies, many of them may remain in their cushy position where no huge profits are made but the government organizes the marketing and covers much of the risks.

If seed markets are liberalized and the centralized distribution system is replaced by free market competition, access to seed for the poorest may be at stake. Thus, in a transition phase in which seed supply is not high enough to meet demand and the private sector focuses on farmers who are better-off and easier to reach, the public seed enterprises can cater to the poorest as, according to their statutes, they do not need to make profits. Alternatively, subsidies for the poor and investment incentives for companies may be temporary measures to ameliorate inequalities.

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