

## Status of Seed System in Ethiopia

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### ABSTRACT

It is a recognized fact; seed is the most vital input for crop production. The objective of this paper was to assess the major challenges and opportunities of seed system in Ethiopia which entirely influence quality and quantity of seed production and subsequent crop production. Seed system in Ethiopia represents the entire complex integration of organizational, institutional and individuals associated with the development, multiplication, processing, storage and distribution and marketing operations of seeds. Informal, formal and alternative seed systems co-exist in Ethiopia with low quality, low quantity and medium contribution for crop production, respectively. The informal seed system accounted about 90% of the seed used by smallholder farmers. It is relatively cheaper; readily available in the farmer's villages and its sustainability is more guaranteed than the formal seed system. Alternative seed system includes community based seed production by organized farmers in the form of cooperatives, model farmers and/or individual entrepreneurs. The major challenges of seed system in Ethiopia were inadequate seed marketing information and infrastructure, diseases and pests introduction, lack of a clear seed strategy, inefficient extension service, limited collaboration within the seed sector, private companies tend to concentrate on profitable crops for their own pocket, lack of awareness and knowledge gap about seed production, inadequate basic seed supply, budget limitation and lack of effective large scale seed enterprises. Whereas, the best opportunities to minimize seed system constraints were presence of high seed demands with a limited seed supply, different agencies are currently reassessing their strategies, government investments in rural infrastructure and general agricultural policies, strong national and regional initiatives in seed production, availability of development agents and different cooperatives every corner of the country. Effective seed demand assessment mechanisms, involvement of end users farmers during seed system planning, every seed producers must be channeled into the seed system, seed system strategy should be prepared properly with respect to quality, time and place of supply and fair pricing, establish clear and simple institutional and functional linkages between research and seed producing institutions, formulation and implementation of clear seed strategy should be exercised in the seed system of Ethiopia.

### KEY WORDS

Alternative; Challenges; Formal, Informal; Opportunities; Seed, Seed System

### INTRODUCTION

Seed is the most vital input for crop production. Most crops started from seed; nothing substitutes the essence of seed for crop production. Entirely; it has a great impact for the development of Ethiopia since

agriculture sector plays a leading role in the country's economy. Hence, the seed quality should be engaged with proper system to increase quality and quantities of crop production. An increasing of seed quality can increase the yield potential of the crop by significant folds. Hence, seed security could be considered as a part and parcel of food security.

Production of seed requires a wide structure with appropriate skill, knowledge and specialization which exercised by a seed system in one way or another. One of the first things to be recognized by the seed system is covering a series of quite distinct operations and responsibilities. These include plant breeding, source of seed production, seed multiplication, quality control, conditioning, storage and marketing. So, the seed system should be taken or played a lion share for seeds required to improve crop production.

Ethiopian seed system can be divided into three components. These are informal seed system, formal seed system and alternative seed system with low quality, low quantity and an intermediate contribution for crop production, respectively. Production and productivities of crops or agriculture at large in Ethiopia is constrained by seed system due to the non-availability of seed in quality and quantity. The demand of improved seed is still increasing rapidly from time to time over the last seven years but its supply is not yet fulfills the farmers' requirement. Among others, unavailability of quality seeds at the right place and time coupled with poor promotion system is one of the key factors accounting for limited use of improved seeds which further contributing for low agricultural productivity. Poor availability and promotion of improved seeds was due to inefficiency of seed systems of the country .

Generation and transfer of improved technologies are critical prerequisites for agricultural development particularly for an agrarian based economy such as of Ethiopian. Despite the release of several technologies, particularly of improved crop varieties, there has been limited use of improved seeds by the majority of farmers. Seed industry in Ethiopia is still in the infantile stage. Lack of effective large scale seed enterprises and industries collaboration with seed sector is the major constraint for the proper development of seed system. All seeds could be developed and supplied by some combination of public and private organizations which not directly involved in crop production. Such entities might include public research institutes, public or private universities, farmer cooperatives, state-owned seed enterprises, non-profit NGOs, extension service agencies, seed trade associations and an array of small, medium, and large private enterprises .

Thus, quality seed multiplication and distribution throughout the country is difficult by public services, universities and research institutes alone. But it is crucial to increase and promote large, modern commercial governmental and non-governmental seed industry and enterprises that to be taken responsibilities of all seed system

operations in an integrated firm. One hundred fifty years ago the United States did not have a commercial seed industry; today it has the world's 2010s largest .

Ethiopian and similar developing African countries seed system performance mainly depends on skills and capacities of farmers' own seed management incase informal seed supply contribute in large for centuries without appreciation by seed system. In the mid-1980s farmer-saved seed accounted for an estimated 35 percent (or \$18 billion) of the total estimated value of \$50 billion for all agricultural seed used worldwide . In developing countries an estimated 80percent of the seed used in the early 1980s was farmer-saved seed.The informal sector is yet the major source of seed of all crops in Sub-Saharan Africa (SSA), with an estimated seed share across eastern Africa (e.g. 80% in Kenya; 90% in Tanzania; 92.5% in Uganda and 96.5% in Ethiopia .

According to Getachew(2010) the formal seed supply sector both from public and private companies provided only 10-20% of the actual demand of the country and less than 5% of the cultivated area is covered by improved seed. The remaining demand has been supplied by the informal seed supply system for the past thousands of years from farmers to farmers, which is considered as illegal by the country seed laws. This condition creates unproductive limitations and hinders the informal system not to flourish in the seed market. As a result, the farmers, farmer owned cooperatives and entrepreneurs are not stimulated to enter into the seed business.

In general, major seed system constraints in Ethiopia are inadequate seed marketing information and infrastructure, diseases and pests introduction due quarantine problem, lack of a clear seed strategy, inefficient extension services, limited collaboration within the seed sector, private companies tend to concentrate on profitable crops, lack of awareness and knowledge gap about seed production, inadequate basic seed supply, budget limitation for field inspection, lack of effective large scale seed enterprise and industry.

Hence, nothing seed quality gain by seed system of Ethiopia unless those critical problems being solved by considering a lot of accessible opportunities(different agencies are currently reassessing their strategies, government investments in rural infrastructure and general agricultural policies, availability of human resource and trained person, presence of high seed demands with a limited seed supply, strong national and regional initiatives in seed production, availability of development agents and different cooperatives at kebele level etc.) in one way or another.

The other big opportunity is that the government of Ethiopia gives high priority to improve the livelihood and socio-economic conditions through increasing agricultural production and productivity to ensure food security, improve rural livelihoods and promote industrial development. So, seed is a key element in improving grain production, food security and rural development. Sustainable availability of good quality seed and well-functioning seed system is vital development issue, without it which attaining the required agricultural production and productivity is impossible. Therefore, it is highly important to assess or review challenges and opportunities of seed system in Ethiopia that entirely influence quality seed production and subsequent crop production.

## OVERVIEW of SEED SYSTEM in ETHIOPIA

### Status of Seed System in Ethiopia

Seed system in Ethiopia represents the entire complex integration of organizational, institutional and individuals associated with the development, multiplication, processing, storage and distribution and marketing operations of seeds in the country. Development and distribution of improved seeds were highly interdependent activities. This chain begins with the development and release of new varieties (hybrids) through applied scientific research and testing, continues through several stages of seed multiplication, processing (drying, shelling, cleaning) and storage of seed and ends with various seed marketing functions( <http://www.jstor.org>).Farmers particularly smallholder ones were involved for multiple kinds of seed systems which can guarantee them in obtaining the required quantity and quality of seeds they need and to market their produce.

Legal issues, such as variety release procedures, intellectual property rights, seed certification programs, seed standard authorization and contract laws enforcement are also an important components of seed systems determining the quality and costs of seeds passing through seed systems in the country. Seed systems in Ethiopia can be divided into three components: the formal, the informal system (sometimes called local or farmers seed system) and alternative or integrated seed system. Both informal and formal seed systems are operating simultaneously in the country and difficult to demarcate between the two. The formal seed supply is not well developed in many developing countries, including Ethiopia. In sub-Saharan Africa, the informal seed marketing is still the dominant system for seed supply. The proportion of seed supplied by the formal seed system is estimated to be around 10-20% in Ethiopia.

As Gloria et al. (2017) stated that Ethiopian policy provisions have a much larger positive impact on the formal seed sector than on the informal sector. It is expected that availability and accessibility of informal seed sector influenced negatively. 16% of coded provisions appear to have negative implications for the formal seed sector while, 25% of provisions appear to have negative impacts on the informal seed sector in Ethiopia (Figure1). The informal seed system should prioritize improving seed quality by increasing awareness and updating farmers knowledge via amending policy provisions.



**Figure1:** Policy provision impacts to the formal and informal seed sectors in Ethiopia

The formal seed system is called formal because it is mainly government supported system and several public institutions are also involved on it. The major actors for formal system are: National Agricultural Research Systems (NARS), Ministry of Agriculture (MoA), Ethiopian Seed Enterprise (ESE) and private seed companies specializing on specific crops like Pioneer. Recently, regional seed enterprises (RSE) were also established as public seed enterprises (such development in seed systems of Ethiopia such as Oromiya Seed

Enterprise (OSE), Amhara Seed Enterprise(ASE) and Southern Nations Nationalities and Peoples Region Seed Enterprise(SRSE) and entered into the formal system. All actors have inter-dependent roles and inefficiency of one actor automatically affect negatively the performances of the rest actors.

Informal seed system also known as local system or farmers' system which is called informal because it operates under non-law regulated and characterized by farmer-to-farmer seed exchange. Five key features of informal are: traditional, semi-structured, operate at the individual community level, uses a wide range of exchange mechanisms and usually deal with small quantities of seeds that demanded by farmers( Abebe and Lijalem,2011).The informal system is extremely important for seed security. The bulk of seed supply is provided through the informal system. About 60-70% of seed used by Ethiopian smallholder farmers is saved on-farm and exchanged among farmers and the remaining 20-30% is borrowed or purchased locally. The informal seed system (either self-saved seed or farmer-to-farmer seed exchange) accounts 90% of the seed used by smallholder farmers.

On average more than 12 million hectare of land were cultivated by major food crops over the last five years (2005-2010). Seed distributions for cereals, legumes, oilseeds, root crops and horticultural crops were covered by local seeds (96.56%) in 2009/10.The informal seed system were also the major source of vegetables. The informal seed system also dominated the seed marketing of Africa at large(Getachew,2010).The Ethiopian farmers depend on the informal system due to the following key reasons: It is relatively cheaper; readily available in the farmer's villages just at the time of seed is needed; reliable and its sustainability is more guaranteed than the formal seed system. The imported seeds were distributed by local traders, farmers' cooperative/union, bureaus of agriculture and NGOS. Such seeds rarely checked for quarantine and quality by the seed regulatory department of the Ministry of Agriculture and the regional bureaus of agriculture despite criticize the expansion of seed system. General, the local seed marketing plays an important role in narrowing the gap between the demand and supply of seed. Local seeds were produced at low cost with local resources, easily adopted and most preferred by the farmers Ethiopia because they had a long experience and possessed better quality in terms of taste and accessibility of seeds at the needed time.

The seed distribution channel of this system includes community based seed production by organized farmers in the form of cooperatives, model farmers and/or individual entrepreneurs. The system receives high technical support from research, NGOs, seed projects and some regulatory oversight from bureaus of agriculture. In most parts of Ethiopia onion, pepper, tomato, potato seed tubers, sweet potato cuttings and cereals were produced under the intermediate system. Farmers accessed to get improved varieties through technology transfer and dissemination mechanisms of the research centres. This is usually followed by community-based seed production and distribution initiatives by individuals and farmers' cooperatives. Some groups of farmers are organized into seed producer cooperatives to produce seeds for local supply. Cooperatives and small and medium seed producers are linked with nearby agricultural research centres or universities (Gebremedhin, 2014).

Community-based seed production also called the intermediate seed system with some regulatory oversight and largely served for seed supply. The community- based vegetable seed production (e.g. onion and potato) includes the participation of model farmers, farmers

cooperatives, individual seed producers with spirit of entrepreneurship and supported by research centres, bureaus of agriculture, NOGs and seed projects. The bulk of vegetable seeds were exported by private seed importers and parasternal enterprises such as Et-Fruit and AISCO. The seed import is predominately made from Europe countries like the Netherlands, Italy, Germany and France. The quantity of imported vegetables is increasing, primarily because of increasing vegetable production both under rain-fed and irrigation.

Remote area farmers were faced by inaccessibility of seed market information and infrastructure. A known fact that seed must reached to farmer at the right time, place, in the right quantity and quality with appropriate price. Since seed marketing is sensitive to many factors, which has been considered as a high risk section for seed distribution. In Ethiopia seed marketing remains one of the weakest links in the seed supply chain, thus limited farmers access to get good quality seed. In general, it is a big constraint for African countries. Certain private stakeholders in commercial crops were started in some countries such as cotton in Burkina Faso, Chad and Mali, groundnut in Senegal and rice in Mauritania and Senegal. However, seed marketing problem has not been bridged by the private sector. This worrying situation indicated that seed produced by formal sectors did not meet a required standard and quantity and not accessible to small producers due to their remoteness from urban markets (Oumar, 2010).The marketing system was poor, access to market information and market linkage was weak.

Therefore, it is very crucial to implement and follow all the marketing functions and marketing principles to reduce the high risk-business nature of the seed sector. The most important questions to be answered; what are the challenges of seed marketing? Why only few farmers are participating in the seed marketing, etc. Although many measures has been taken to improve the seed sector (public institution) for the last five decades, farmers' access to seed was hindered by technical problems, poorly developed seed sector and rural marketing infrastructures. Thus, development and promotion of different seed system at both community and private levels close to the remote area farmers are a big solution for such problems.

## CONCLUSION AND RECOMMENDATION

The formal, informal and alternative seed system were operating in Ethiopia and playing the lion share to alleviate seed supply problem for crop production. Legal issues, such as variety release procedures, intellectual property rights, seed certification programs, seed standard authorization and contract law enforcement has a big contribution for determining the quality, quantity and costs of seeds in the country. The government is focused on formal seed system to minimize seed shortage and quality problem and left other seed system operating in the country that is why the seed system not yet developed to address remote area farmers as required.80% of seed distribution and 85% the cultivated land were covered by local seed in the previous decades because informal (farmers) seed system is widely operating by farmers without significant support from the government. These are the first bottle neck factors for quality seed supply shortage in the country.

The major challenges of seed system in Ethiopia were inadequate seed marketing information and infrastructure, diseases and pests introduction, lack of a clear seed strategy, inefficient extension service, limited collaboration within the seed sector, private companies tend to concentrate on profitable crops for their own pocket, lack of awareness and knowledge gap about seed production, inadequate basic

seed supply, budget limitation and lack of effective large scale seed enterprises. The Ethiopian Seed Enterprise that tried to produce plenty of seeds in the formal system as much as possible for the years. But it was inefficient seed distribution under farmers' field. Coordination and linkages among all actors and pertinent stockholders is paramount importance that needs strengthening. Technology promotion and seed marketing should also be enhanced. Furthermore, seed system of Ethiopia has a lot of opportunities to solve those critical problems listed above. Thus, seed system needs further investigation by full usage of here accessible opportunities such as: presence of high seed demands with a limited seed supply, different agencies are currently reassessing their strategies, government investments in rural infrastructure and general agricultural policies, strong national and regional initiatives in seed production, availability of development agents and different cooperatives at the border of the country.

The other good opportunity which go side by side is that the government of Ethiopia gives high priority to improve the livelihood and socio-economic conditions through increasing the agricultural production and productivity in order to ensure food security, improve rural livelihoods and promote industrial development. Generally, the seed system of Ethiopia needs further investigation specially to run the three seed system with full collaboration and dedicated responsibilities and beside these the following points should be given attention: effective seed demand assessment mechanisms, involvement of end users farmers during seed system planning, every seeds producer must be channelled into the seed system, seed system strategy should be prepared properly with respect to quality, time and place of supply and fair pricing; more times seed production per year is needed to fill the huge gap between seed demand and supply; establish clear and simple institutional and functional linkages between research and seed

producing institutions; formulation and implementation of clear seed strategy is crucial for seed system of Ethiopia.

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