Investment opportunities in the Ethiopian

Vegetables & Potatoes

Seed sub-sector

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4

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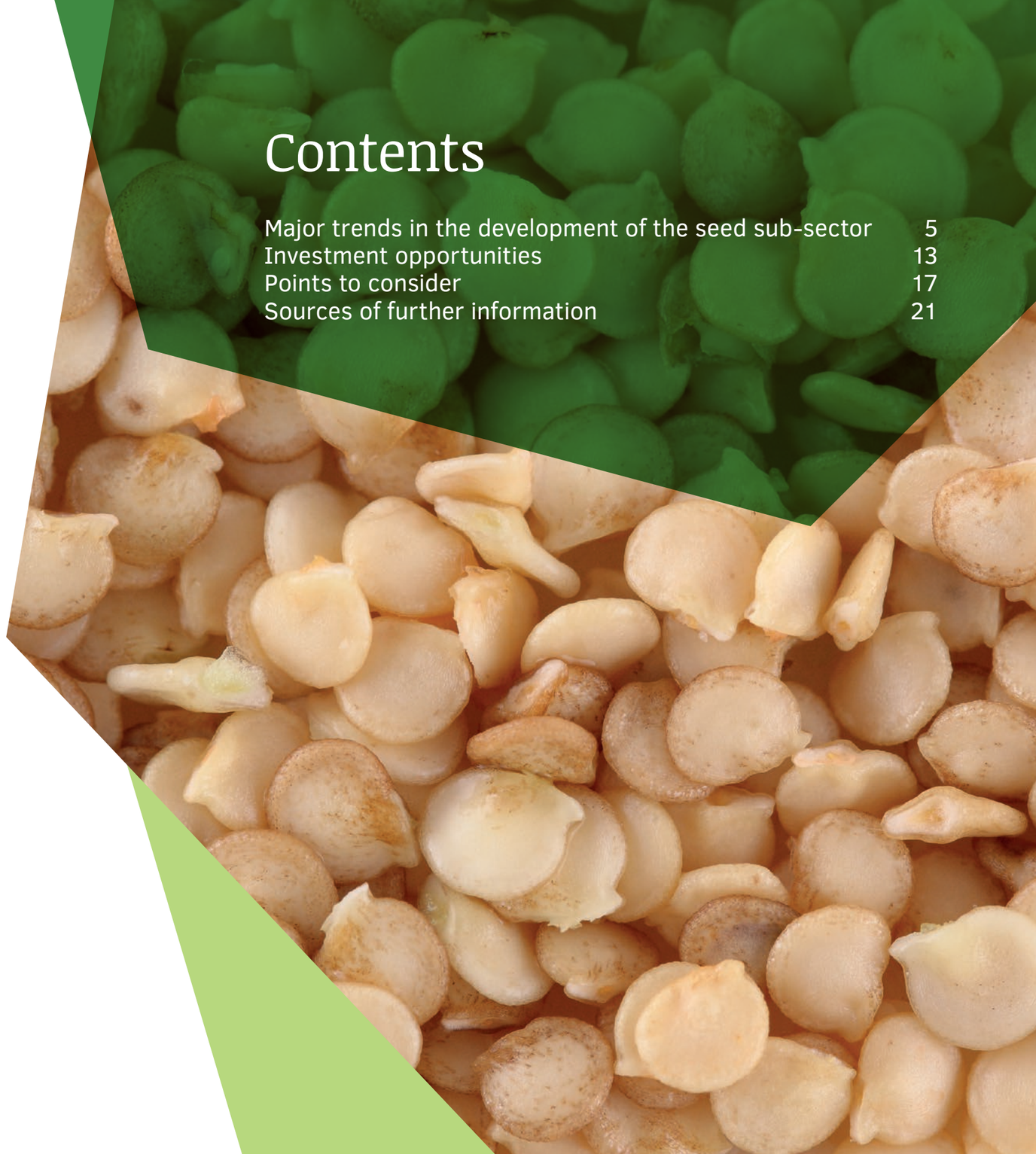

Message *from*

H.E. Teshome Toga

Ambassador of the Federal Democratic Republic of Ethiopia to the BENELUX, Baltic Countries and Permanent Representative to European Union

On behalf of the Ethiopian Embassy, I would like to warmly welcome you to the business event organized by both the Ethiopian Embassy in Brussels and the Embassy of the Kingdom of Netherlands in Addis Ababa. The Ethio-Netherlands Business Event, being first of its kind, is aiming at enforcing the ever-growing friendly relations between the two countries. It is my strong believe that both the Ethiopian and Dutch private sectors shall benefit from this important business forum as it creates a unique opportunity for new networks and acquaints the Dutch private sector with valuable insights about business opportunities in Ethiopia.

Presently, Ethiopia and the Netherlands enjoy good diplomatic relations and a strong development and economic partnership. Ever since the Netherlands opened its diplomatic Missions in Addis Ababa in 1950, the relation grew from strength to strength. Most recently, the second round of political consultation took place in The Hague from 5 to 6 March 2015, where we emphasized the need to further stimulate the economic relations by maintaining and diversifying the foreign direct investment (FDI) and trade between the two countries. Our statistics clearly indicate that Dutch investors are leading among Europeans in FDI flows in Ethiopia. Tapping into the Dutch investment opportunity and potentials in Ethiopia, the Dutch government has included Ethiopia in almost all financial instruments available for the private sector encouraging investment in developing countries.

Trade between the two countries is showing an encouraging development in recent years. Today, there are over 100 Dutch companies active in Ethiopia, and this number is increasing. However, I strongly feel that the current level of investment is not commensurate with the potentials of the two countries. My government is highly committed to promote the private sector by offering a comprehensive set of incentives to enhance the FDI in the country. Investors shall be accorded with several incentives depending on the sectors; such as custom duty payment exemptions on capital goods and construction materials, income tax exemptions from two to seven years and carry forward losses. Similarly, several export incentives have been put in place to encourage investors aspiring for export. Ethiopia is highly devoted to protect investment through its Investment Code that protects private property, repatriation of capital and profit. More importantly, my government guarantees constitutional protection from expropriation. Ethiopia is also a signatory to the International Investment agreements such as the Multilateral Investment Guarantee Agency (MIGA), Bilateral Investment Promotion & Protection Treaties (BIPPT), and the International Convention for the Settlement of Investment Dispute (ICSID). Equally, Ethiopian products have duty-free, access to the U.S. and EU markets.

Ethiopia is now going through a constant multifaceted economic growth and transformation. Ethiopia's improved economic infrastructure, abundant and affordable labor along with its excellent climate and fertile soil remains the country's comparative advantage attracting investors. Market wise, the >90 million population and strategic geographical location offer a wide market access. Ethiopia with its huge investment potential has a lot to offer for the Dutch private sector. My government is ready to address any investment request from the Dutch private sector and to create economic interdependence between the two countries and peoples. It is therefore, my sincere believe and expectation that the outcome of this business event will highly equip participants with the required information and techniques necessary to elevate the economic relations of the two countries to a higher level.

Using this opportunity I would like to extend my appreciation to all the stakeholders who took part in organizing this important event both in Ethiopia and in the Netherlands along with our Embassy in Brussels. My special thanks also goes to my counterpart and friend Lidi Remmelzwaal, the Ambassador of the Kingdom of the Netherlands to Ethiopia and Djibouti for her tireless effort and the excellent working relations we have developed over the last two years.

With my best wishes for the success of the Ethio-Netherlands Business Event.

Foreword *from*

Lidi Remmelzwaal

Ambasador of the kingdom of the Netherlands in Ethiopia

Not many people realize how much Ethiopia has changed over the last two decades. Ethiopia combines strong economic growth with impressive results in poverty reduction and other social indicators, food security and infrastructure; a structural transformation of the economy is underway, with an increasing role for manufacturing and industrialization. For the coming years, the perspective for future private sector investment is promising in many areas, especially in sectors where more value can be added and where large numbers of jobs can be created.

Of course these developments have also had its effect on the changing relation between the Netherlands and Ethiopia. Although development cooperation is still very much needed for years to come, the relation has broadened into a dynamic partnership, in which Aid and Trade and economic cooperation are becoming more and more prominent.

Many Dutch companies have discovered the potential in Ethiopia; at present we have are over 100 companies with a permanent basis in Ethiopia and the number is increasing. Although the majority of these companies is active in horticulture/agriculture, there is also Dutch presence in other sectors like transport, construction, tourism, food & beverages etc.

Opportunities in Ethiopia are almost endless and one of the promising areas is the Agro-sector of Seed. The Netherlands Embassy in Addis Ababa therefore felt the need to commission a Business Opportunity Report, to provide further insight into the opportunities in seed sub-sector and specific information for companies that are interested to invest in this sector in Ethiopia.

This Business Opportunity Report will also be used as an important input for the first Ethio-Netherlands Business Event that will take place on 5 and 6 November 2015 in the Netherlands. This important event will focus on a selected number of promising sectors in Ethiopia, such as seeds, oilseeds, poultry, dairy, spices, textiles and logistics.

The idea for this Ethio-Netherlands Business Event surged in a dynamic discussion that I had with my colleague, the Ethiopian Ambassador to the Netherlands (based in Brussels). We felt that the growing economic cooperation, the ambition of Ethiopia and the numerous opportunities for Dutch companies deserve a much broader and prominent approach, such as this Ethio-Netherlands Business Event, in addition to sectoral economic and trade missions.

In good partnership between Ethiopia and the Netherlands this initiative was further developed and together with many other partners and stakeholders this idea has been turned into reality. This Business Opportunity Report is an important building block for the Ethio-Netherlands Business Event.

I hope that this Business Opportunity Report on Seed will prove to be instrumental for raising the interest of Dutch companies to invest in Ethiopia and will provide them with useful and realistic information. The Ethio-Netherlands Business Event will certainly offer an interesting podium for this and I am very much looking forward to this important event. It will certainly be yet another step in the further strengthening and broadening of the partnership between the Netherlands and Ethiopia.

Major trends in the development of the seed sub-sector

1

1.1 Importance of the vegetable sector to the economy

The opportunities for vegetable seed sales in Ethiopia are derived from the size and type of the product market. The product market for vegetables in Ethiopia has been growing rapidly, both in terms of crop portfolio, as well as size. The data in table below provide an overview of the trends of the last 20 years.

Acreage of Ethiopia's five most important vegetables

Acreage	1993	2003	2013
Cabbages	6,000	18,000	38,000
Carrots	560	1,100	1,500
Chilies*	35,767	33,661	56,991
Onion	9,700	19,017	23,900
Tomato	4,100	3,761	7,000
Total	58,120	75,539	127,391

Source: Adapted from FAOStat – crosschecked with CSA data (* CSA Data, 2012)

The overall acreage of vegetables in 2013 was around 200,000 hectares, of which close to 120,000 hectares were dedicated to five crops: hot pepper, onions, cabbages (including kale), tomatoes and carrots. Other important crops are local leafy vegetables like Swiss chard, green beans and peas, garlic, cauliflower, beetroot and sweet pepper. Over the last 20 years the acreage dedicated to vegetables has doubled, which is in line with the overall population growth which has also doubled.

Supported by yield increase, production almost quadrupled over the same period. Though still relatively low compared to neighboring Kenya or South Africa, specific areas (or clusters) have seen a rapid increase in yields. The decrease in tomato yields in 2013 was mainly due to the *Tuta Absoluta* pest outbreak. At the time of writing, this disease had been brought under control and yields were up to around 15–20 t/ha.

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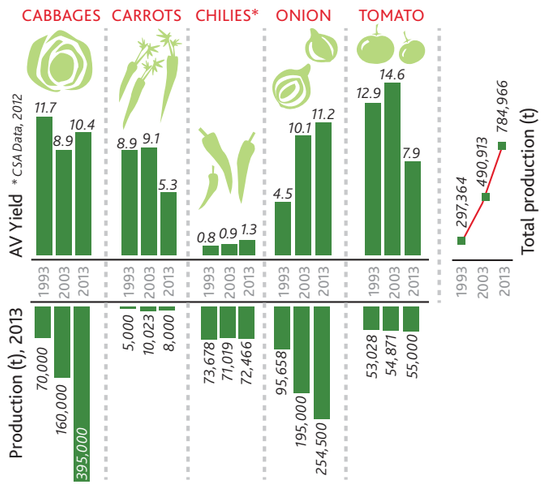
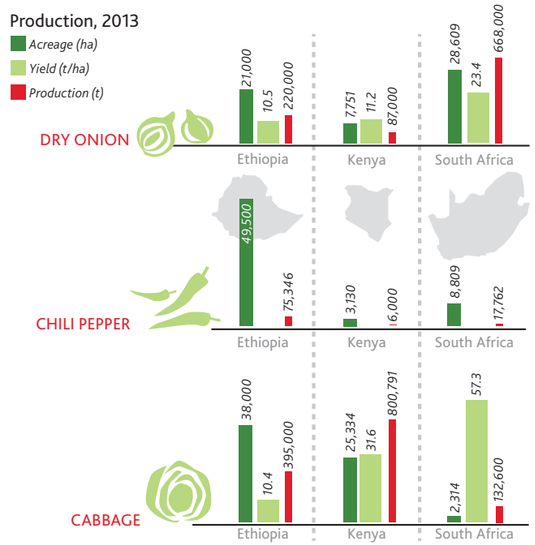
Yield and production of Ethiopia's five most important vegetables (2013)
Source: Adapted from FAOStat – crosschecked with CSA data



Dry onion, chili pepper (green and dry) and cabbage production figures compared between Ethiopia, Kenya and South Africa (2013)
Source: Adapted from FAOStat – crosschecked with CSA data



Overall production of vegetables in Ethiopia is estimated at around 2.4 million tons, which translates to around 25 kg per person per year, or 70 grams per day—far below the recommended 200 grams per day advised by the WHO. Only Burundi ranks lower in an overview of African countries that also includes Ghana, Kenya and Tanzania (in: Wiersinga & de Jager, 2007).

Another comparison with Kenya and South Africa shows that Ethiopia especially produces a lot of hot peppers and onions. With respect to chili peppers, Ethiopia is among the top-10 largest producers in the world. Also cabbages (and other brassica species) rank high in Ethiopia, with 395,000 tons produced annually.

1.2 Importance of the potato sector to the economy

The main production season for potato, at altitudes higher than around 2500 masl is June to September (*Meher* in Amharic). The off-season production period for Ethiopia at higher elevations is April to August (*Belg* in Amharic). Interestingly, the main production season for ware potato represents only 34,000 ha, while the off-season production is around 128,000 ha. The reason for a gradual shift from *Meher* to *Belg* is because of the increasing pressure of late blight and farmers experience less risk when cultivation takes place during the "small" rains combined with irrigation. The average potato production throughout Ethiopia is 8–12 t/ha. This is a relatively low figure, especially considering the country's attributes, with its favorable climate at higher elevations, soils and irrigation potential. The main production constraints are related to the narrow genetic basis of the varieties and the poor seed quality. In addition, the disease pressure/susceptibility is increasing and the management capacity of the farmers is poor (Haverkort *et al.*, 2012).

Ethiopia officially produces potato on 160,000 ha with an average yield of 10 t/ha so the national production is 1.6 million tons. Assuming that 1.5 t/ha is used as seed (15% of the production) and another 15% is lost in storage and transport, then 1.12 million tons is actually consumed by a population of 85 million. This means that the average Ethiopian consumes 13 kg of potatoes per year or 250 g (two modest portions) per week.

1.3 Main areas for vegetable and potato production

The Agricultural Transformation Agency (ATA) has prioritized five clusters or growth corridors for further development of the horticultural sector. These are currently also the hotspots for vegetable production. The areas are associated with good water sources (both surface and borehole) enabling off-season irrigated production or supplementary irrigation during the rain-fed production seasons.

Especially the cluster in the Eastern part of the country, the Dire Dawa–Somali Corridor, is responsible for most of the regional exports to Djibouti and Somalia. This is especially the case for tomatoes and onions.

For potatoes, three clusters stand out: the Addis and Oromia corridor, the Hawassa–Arbaminch Corridor (including West Arsi) and the Bahir Dar corridor. The city of Shashemene, strategically located in between the first two corridors, forms the most important market for ware potatoes.

In many parts of the country the Government of Ethiopia has embarked on the construction of large irrigation schemes. In the Bahir Dar corridor alone 7000 ha has been developed in the Koga scheme, 7000 ha in the Fogera scheme and 5000 ha in Dumbia (north of Lake Tana). Many of these schemes (at around 2.000 masl) have excellent conditions for cultivation of temperate vegetable crops (green beans, potatoes, cabbages, tomatoes, carrots and onions) using mostly flood or furrow irrigation. It is estimated that more than 30% of all vegetables produced come from irrigated land (Emana *et al.*, 2013).

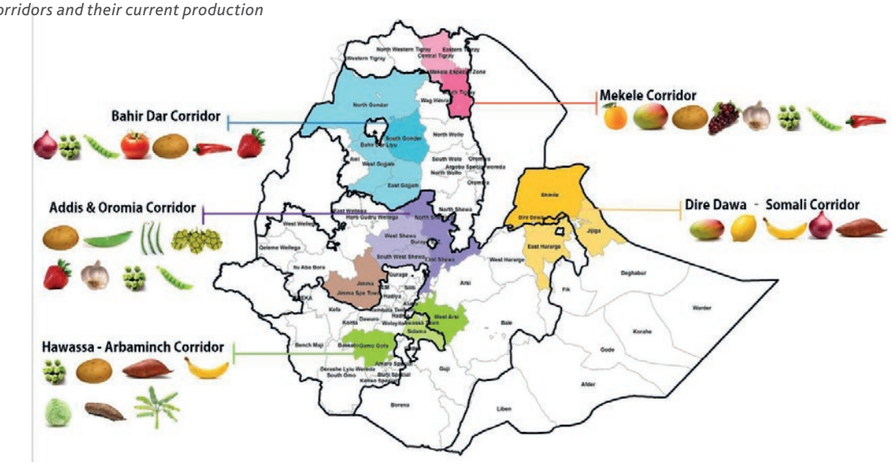
1.4 The market for vegetable seeds

The market for vegetable seeds is currently dominated by 'generic', mostly OP varieties. The popular varieties for a number of vegetable crops in Ethiopia are:

- **Onion:** Bombay Red, Red Creole, Adama Red (locally released)
- **Chili Pepper:** Marekofana (a local variety; pungent (50.000+ SHU3); long, dark red chili)
- **Tomato:** Melkashole (local), Moneymaker and Marglobe
- **Cabbage:** Copenhagen Market and Holland
- **Carrot:** Nantes
- **Beetroot:** Detroit and Detroit Nero

For vegetables like onion, cabbage, carrot, lettuce, Swiss chard, beetroot and leek, the variety replacement period is quite long, as old varieties are still in cultivation. It is estimated that the variety replacement rate is once every three to five years.

Horticultural corridors and their current production



Seed Companies Registered Commercial Vegetable and Seed Potato Varieties (2012)

Crop	Variety	Type	Year of Reg.	Seed Company
Tomato	Jewel (STH-808)	Hybrid	2012	Vibha Seeds Ethiopia PLC
Tomato	Syno (STH-805)	Hybrid	2012	Vibha Seeds Ethiopia PLC
Tomato	Galilea	OPV	2011	Hazera Genetics Ltd
Tomato	Bridget 40	OPV	2011	Hazera Genetics Ltd
Tomato	Shanty	OPV	2009	Hazera Genetics Ltd
Tomato	Irma	OPV	2009	Hazera Genetics Ltd
Tomato	Rainbow	OPV	2011	Era Agrilink PLC
Tomato	Anna F1	Hybrid	2011	Mogno, Maria Rita
Tomato	Eden F1	Hybrid	2011	Beck, Bunn, Teresa
Tomato	Topspin F1	Hybrid	2011	Bejo Seed/Crop Grow PLC
Tomato	Barnum	OPV	2011	Markos PLC
Onion	Rosy (SOV-111)	OPV	2012	Vibha Seeds Ethiopia PLC
Onion	Caramelo F1	Hybrid	2012	Impact Mundial Agri PLC
Onion	Sweet Caroline	OPV	2012	Impact Mundial Agri PLC
Onion	Red Passion F1	Hybrid	2011	Bejo Seed/Crop Grow PLC
Onion	Sivan	OPV	2009	Hazera Genetics Ltd
Onion	Neptune	OPV	2009	Hazera Genetics Ltd
Onion	Jamber F1	Hybrid	2011	Jones Rick
Onion	Red King	OPV	2011	Markos PLC
Pepper*	Capsi (SCH-902F1)	Hybrid	2012	Vibha Seeds Ethiopia PLC
Pepper*	Spicy (SCH-922F1)	Hybrid	2012	Vibha Seeds Ethiopia PLC
Pepper*	Supreme (SCH-924F1)	Hybrid	2012	Vibha Seeds Ethiopia PLC
Pepper*	Serenade	OPV	2011	Hazera Genetics Ltd
** Capsicum spp.*				
Cabbage*	Rotonda F1	Hybrid	2011	Bejo Seed/Crop Grow PLC
Cabbage*	Thomas F1	Hybrid	2011	Bejo Seed/Crop Grow PLC
Cabbage*	Lucky F1	Hybrid	2011	Bejo Seed/Crop Grow PLC
Cabbage*	K500	OPV	2011	Hazera Genetics Ltd
Cabbage*	Oxylus F1	Hybrid	2011	Carl Scholten
Cabbage*	Victoria F1	Hybrid	2011	Carl Scholten
** Brassica oleracea*				
Carrot	Samson	OPV	2011	Bejo Seed/Crop Grow PLC
Potato	Red Scarlett	OPV	2010	HZPC Holland/ SolaGrow PLC
Potato	Caesar	OPV	2009	HZPC Holland/ SolaGrow PLC
Potato	Mondial	OPV	2009	HZPC Holland/ SolaGrow PLC

Source: Ministry of Agriculture: Crop Variety Register

Though OP varieties are currently most popular, a number of initiatives are being undertaken to promote the uptake of hybrids. The growing market for hybrids is supported by the interests of international seed companies and the number of new varieties that have been released over recent years (data up to 2012, see table on page 8)

In addition, seed imports have risen gradually and now amount to more than US$ 3 million per year. The table below shows the major sources of these seeds. The Netherlands figures prominently, with more than US$ 2 million and a market share of 64%.

Amount and value of vegetable seed imported in Ethiopia from country of consignment (2012)

Country	Quantity (t)	CIF Value (*1000US$)	% of value
Belgium	0.1	70.8	2.1
France	3.6	64.7	1.9
Germany	3.8	74	2.2
India	2.6	24.2	0.7
Israel	1.2	690.9	20.5
Italy	11.9	216.3	6.4
Kenya	0	14.4	0.4
Netherlands	103.6	2170	64.4
Niger	0.1	13.5	0.4
Spain	1.0	29.5	0.9
Thailand	0	0	0
Total	127.9	3368.3	99.9

Source: Ethiopian Revenues and Customs Authority, 2012

As it is not allowed for foreign companies to trade directly within Ethiopia, the seeds are imported by a number of agents and parastatal enterprises. The most important ones are listed in table right above.

Many of the Dutch seed companies have also resorted to this mode of operation, working together with an Ethiopian agent to import their seed and promote their varieties. An exception is made for (foreign owned) vegetable production companies that are fully dedicated to exports, as they can import varieties directly from the foreign seed companies and so far no variety testing is necessary.

Seed Companies Registered Commercial Vegetable and Seed Potato Varieties (2012)

Organizations	Seed production	Seed Processing	Seed Import	Seed Retail
Teppo Agric & Trading			X	X
Hawassa Greenwood	X		X	X
Ethioflora	X			
Ethiopian Seed Enterprise	X	X	X	X
Markos			X	X
Axum Greenline			X	X
SolaGrow	X		X	X
Elfora	X			
EAR			X	
Chemtex			X	X
EthioVeg Fru	X			
ETFruit			X	X
Ajmu Import & Export Trading Enterprise			X	X
Kaleab Farm Development	X			X
General Chemical and Trading			X	X
Segel General Trading			X	X
Upper Awash Agro Industry	X			X

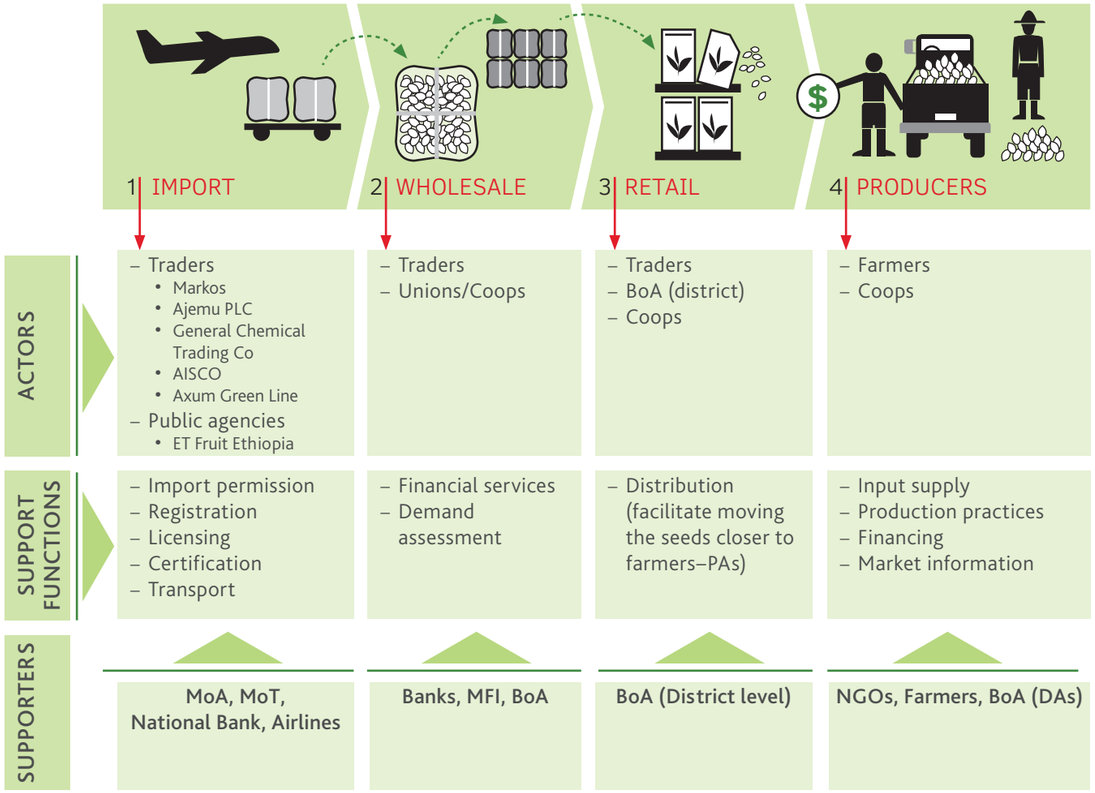
The main reasons for replacing varieties are availability of seed, yield advantage (e.g. tomato, cabbage, and potato), expected long shelf life (e.g. tomato and cabbage), early maturity (e.g. tomato and onion), tolerance to diseases (e.g. tomato, beetroot and potato), taste/ market preference (e.g. tomato, onion), better prices (e.g. tomato, onion and sweet potato), and better local adaptation (e.g. onion and beetroot) (Emana *et al.*, 2014). Amongst these criteria, seed availability ranks highest. In many cases farmers only have one or two (OP) varieties to choose from, showing the gap in distribution networks and promotion of new varieties.

Important for further expansion of hybrid varieties in Ethiopia's vegetable sector is the upgrading of agricultural practices, including the development of (professional) nurseries, better seedbed preparation (raised beds), soil and water management, and pest and disease management. At a number of well managed farms, for example, tomato harvests of more than 60 t/ha have been recorded. These figures have been achieved by both small- and large-scale growers. In particular, the agricultural practices in the Central Rift Valley have seen dramatic improvements in the last decade.

Seed chain

The Emana *et al.* (2014) report describes Ethiopia's seed value-chain well. It is mainly the government agencies like AISCO and ET Fruit that import large quantities of (OP) vegetable seed that are distributed to cooperative unions and the Bureaus of Agriculture at district level. Other big importers are Markos and Axum Green Line. Some seed flows to the traders and smaller agro-input shops at district capital level.

Seed chain for imported vegetable varieties (Emana et al., 2014)



1.5 The market for seed potatoes

Sources of seed potatoes

In Ethiopia only 1.3% of the total seed requirement is met by relatively high-quality seed (Gildemacher *et al.*, 2009a). Seed potatoes are produced and distributed by farmers: 99% is either taken from own stock or bought from other farmers (Gildemacher *et al.*, 2009). This informal supply system has some disadvantages (Emana and Nigussie, 2011):

- **Phytosanitary:** In all Ethiopian potato-growing areas, late blight is common. And in the informal supply system quality measures are poorly applied.
- **Physiological:** The common practice is to use potatoes that are too small or inferior for consumption.
- **Physical:** Tubers are damaged at all stages in the supply chain. For instance, produce is damaged during harvesting with long, sharp forks, or bruising occurs during packing in sacks and transporting.
- **Genetic qualities:** Mostly potatoes of unknown origin and varieties are used.

Seed value chain

According to the survey done by Emana and Nigussie (2011) in Tigray and in SNNPR, seed-potato farmers sell 50–57% of their seed to other farmers. Shashemene is seen as hub for the seed-potato supply system. The formal seed-potato supply chain is in its infancy. One private company (SolaGrow PLC) is active in seed-potato production.

The study by Gildemacher *et al.* (2009a) showed that 44% of Ethiopian farmers renewed their seed, hence suggesting that 56% never do. The average renewal interval in Ethiopia was found to be three seasons. The main sources of new seeds were the village market (69%), neighbors (14%), and specialized seed growers (16%) provided the remaining supply (Gildemacher *et al.*, 2009b).

Varieties and seed production

Currently 29 varieties have been released officially to the Ethiopian market. Most of these originate from the EIAR-CIP breeding program, including three varieties with different levels of late blight resistance. The Jalene variety has a high level of resistance, while Gudene has moderate resistance. Both were released by Holeta Agricultural Research Centre in 2002 and 2006, respectively. The varieties Caesar, Mondial and Red Scarlett have been released by HZPC's local counterpart SolaGrow, and are being multiplied locally at different altitudes.

There are a number of plant tissue culture labs in Ethiopia which can produce potato plantlets for further multiplication into mini-tubers. VCI Ethiopia is one of the main players which can produce potato plantlets within the country (in Debre Zeit).

Investment opportunities

2

Three areas of seed sector opportunities are presented in this chapter, in line with the different functions within seed companies: breeding, production (including quality management and processing) and sales. In addition, another business opportunity is explored for establishing a professional nursery for strong vegetable seedlings.

2.1 Breeding

Not many Dutch vegetable seed and seed potato companies have established breeding activities in Africa; though a number of ornamental breeders have. The only vegetable breeding company present in Africa is Afrisem, a collaborative effort of East-West and RijkZwaan in Arusha, Tanzania. The global breeding efforts of various companies produce materials outside of Africa, that are tested in the diverse climate and soil conditions in Africa. For example, for day-length sensitive crops (like onion) tropical varieties are required for Ethiopia. For setting up breeding activities, a number of criteria will be important: potential market for the varieties in those agro-ecological conditions, policy environment, skilled labour, availability of germplasm, and overall production costs.

AGRO-ECOLOGICAL CONDITIONS: Ethiopia has a wide variety of agro-ecological conditions, and as such it would serve as a good location for developing and testing new varieties. Newly bred varieties can be tested for adaptability to e.g. different night temperatures/humidity within a small geographical distance, and various disease pressures. The country has hot areas that are close to sea-level and mountainous areas of up to 4.000 masl.

POLICY ENVIRONMENT: Ethiopia doesn't currently have an operational system of Plant Variety Protection; it is under development however. This could discourage investments in breeding as developed varieties cannot be registered and protected in-country (on DUS criteria).

SKILLED LABOR: Many renowned breeders come from Ethiopia. At the same time biotechnology supported breeding is at an infant stage, and most attention is focusing on cereals and legume breeding through traditional breeding (crossings) and selection.

AVAILABILITY OF GERMPLASM: The Ethiopian Biodiversity Institute (EBI) has some accessions on vegetables though most accessions are for local crops like teff, Ethiopian mustard and barley; for which Ethiopia is a biodiversity hot spot. The biggest collection of African vegetable germplasm is in Arusha Tanzania at the AVRDC Genebank.

In conclusion, Ethiopia has some important advantages, but especially in terms of policy environment and skilled labour, other countries might have better opportunities for vegetable breeding.

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2.2 Seed production

Ethiopia hosts excellent conditions for seed production. Especially the drier areas in the Central Rift Valley and Eastern flank of the Rift Valley (Upper Awash and Harrar/Dire Dawa) provide sufficient light (lux) year-round, while day temperatures are high and night temperatures can be relatively low. In addition, these areas hold sufficient surface and groundwater irrigation opportunities, and humidity is relatively low.

Climatic conditions are good for both protected cultivation with hand pollination (tomatoes, sweet pepper), as well as open field production (both OPs and hybrids: onions, squashes/melons). As suitable land is available on altitudes ranging between 1200 and 2000 masl, Ethiopia offers both warmer (more tropical) climates, as well as environments with greater day–night temperature differences.

The production of brassica species, radish, carrot and spinach, could be feasible in Ethiopia in areas with more temperate climates (above 2000 masl) as they require low temperatures for vernalization to bolt, flower and set seed. However, these species can be produced well under mechanized conditions in developed countries, as they don't require hand pollination (being gene-controlled).

Already some Dutch companies are starting up production facilities for hand-pollinated crops and varieties, and have been successful in acquiring land and the necessary licenses.

Possibilities also exist to link up with existing seed producers and producer groups. Especially for very labor-intensive open field crops, this option seems most attractive. The ISSD project has a number of connections with larger vegetable seed producers and producer groups that could be explored for collaboration on seed multiplication. It is expected that the new Breeders Rights Proclamation will provide sufficient protection for varieties that are grown under these types of arrangements; though this still has to prove itself.

The Government of Ethiopia is keen on attracting this type of high-value, labor-intensive investment, and can assist with finding suitable land. For 100% exported seeds a variety release exception is taken up in the Seed Law. This should simplify production investments in Ethiopia's seed sector especially for vegetable seed (see also chapter 3). The necessary export licenses and phytosanitary certificates can be provided by the Plant Health Directorate of the Ministry of Agriculture, upon inspection of the seed-production premises.

The case is slightly different for seed potatoes, as the costs for transporting them to Ethiopia are high. In addition, the Ethiopian government encourages local production of such a bulk commodity. Hence, the only professional seed potato company in Ethiopia produces locally on the basis of mini-tubers. This company focuses on both locally-released and international (HZPC) varieties. The VCI Plant Tissue Lab in Debre Zeit can further assist in supplying strong uniform plantlets of improved varieties for further seed multiplication. The different altitudes (2500 masl+) in Ethiopia provide excellent, disease-free conditions for seed potato multiplication. Currently, the volatility in the product market (ware potatoes) is the major constraint for farmers investing in improved inputs. New initiatives on potato fries and chips production is expected to improve these market conditions.

In summary, Ethiopia has excellent conditions for seed production, especially for hand-pollinated hybrid crops and varieties, with a large range of climatic zones that have sufficient year-round water availability, light intensity and low, relative humidity. The ISSD Project can assist interested seed companies in their exploration of production locations and potential partners in Ethiopia.

2.3 Seed sales

Many of the larger Dutch vegetable seed and seed potato companies are already active in the area of seed sales in East Africa. Especially Kenya, and to a lesser extent Tanzania, receive much attention, while Ethiopia is increasingly 'on the radar'. There has been some interest stemming from the presence of Dutch (export) vegetable growers, but the local small- and medium-sized producers are increasingly becoming an attractive market. Dutch seed companies that sell 'heirloom' OP varieties (like Bombay Red and Copenhagen Market) have been active for a long time, and in recent years Dutch breeding companies have also entered the market.

Of special interest are the areas described in Chapter 1: the horticultural growth corridors or clusters. It is in these areas that agricultural practices have improved quite substantially, including irrigation and row planting (and staking), and farmers are ready for the next step of using hybrid seeds.

In Ethiopia, foreign companies are not allowed to trade directly. Instead, trading is done through an Ethiopian company (PLC). Consequently, most seed companies work with a wholesaler or agent. Import procedures are rather straightforward, though variety registration is required for all crops (including vegetables). The latter can be achieved through one-season verification trials carried out on six locations by a research center

Agents in turn work together with cooperatives and cooperative unions, agro-dealer shops (in district or regional capitals) and do direct sales to bigger farmers. A new development is the establishment of commercial farm-service centers, which are larger shops that sell agro-inputs and provide additional advice to farmers. For more information see: http://www.cfspethiopia.org/.

To convince farmers to use more expensive hybrid seeds, additional training in nursery and cultivation practices seems necessary. A number of co-financing projects or public-private partnerships are currently underway to support such practices. ISSD Ethiopia can assist Dutch seed companies in:

- exploring the Ethiopian market;
- providing advice on matching companies with potential Ethiopian agents;
- variety registration; and
- demonstrations and trainings.

2.4 Professional vegetable seedling nurseries

One of the major challenges in vegetable production is the first step in growing strong, young plants. The most common practice currently is the establishment of field nurseries with high densities of plants and risks of low germination and disease infestation. Also after transplanting, many young plants die or deliver reduced yields later on.

This can be easily prevented by ensuring a more professional, dedicated nursery for the production of strong seedlings. In a number of countries this has become a profitable business, where companies exclusively specialize in seedling production (both for fruit and vegetables). Already in Ethiopia, a professional nursery is producing more than 10 million seedlings yearly for the local market.

There is a real business opportunity especially for tomato and hot pepper seedlings, as these are in highest demand, though cabbage and beetroot seedlings are also requested. Production can take place on demand, whereby the farmer provides the seed against a top-up fee per seed, or where the nursery buys the seeds and sells at a fixed price per seedling (of a specific variety). The latter option can create a more direct relationship between the seed companies (primary agents) and the nursery, ensuring that good quality (and well-stored) seed is being used. This can also assist Dutch seed companies in finding a better entry point in the Ethiopian market.

Professional nurseries require sterilized medium (e.g. cocopeat and peat moss), plastic seed trays, tables and protection against insects (netting), with strict hygiene protocols. In addition, a secure and clean water source is required for watering or sprinkling. Simple 'screen houses' are available in Ethiopia, or can be constructed locally. For larger greenhouse facilities imports are necessary. The demand for seedlings is high around the irrigated vegetable areas (growth corridors). It is expected that an additional one-hectare screenhouse with irrigation can become profitable, solely focusing on the production of chili pepper seedlings.

Points to consider

3

The policy context for seed companies is mainly defined by the procedures developed for the import and export of seeds or planting material, as well as procedures surrounding the release and protection of varieties. The following sections summarize these, as well as the potential implications of regional harmonization efforts within COMESA.

Most of the information is derived from the Seed Law (2013). In April 2015, the new Seed Regulations were submitted to the Council of Ministers. Ethiopia has also signed the COMESA Regional Harmonization for Seed Regulation. At the time of writing this report, the new Seed Directive was being assessed for COMESA compatibility.

►►►

3.1 Variety release procedures

Unlike most countries in East Africa, Ethiopia requires vegetable seed companies to register their varieties in Ethiopia. For varieties that have already been successfully released in other countries, Ethiopia requires a one-season, six-location verification trial. For new (domestically bred) varieties, the requirement is two seasons and three locations.

The application process starts with the secretary of the Plant Variety Release Committee at the Ministry of Agriculture. There, an application form has to be submitted, after which a federal or regional research center can be approached for contracting the variety trials.

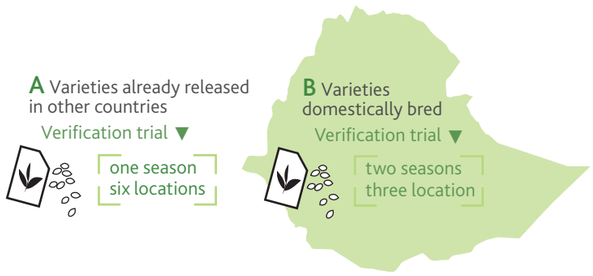
The selected lead research center is the entity responsible for subcontracting the other research centers to organize the trials. Evaluation of new varieties takes place according to Value for Cultivation and Use (VCU) principles. A seed company, or agent, applying for variety trails is free to decide which research center to select. However, Melkassa Agricultural Research Center (MARC) is a common choice for lowland vegetables (onion, tomato, pepper, cucumber), and for potatoes and highland vegetables (cabbage, carrot, lettuce) Holetta Agricultural Research Center (HARC) is often selected. Both centers have the national mandate for these crops. Kolumsa Agricultural Research Centre (KARC) is also well known for highland vegetables.

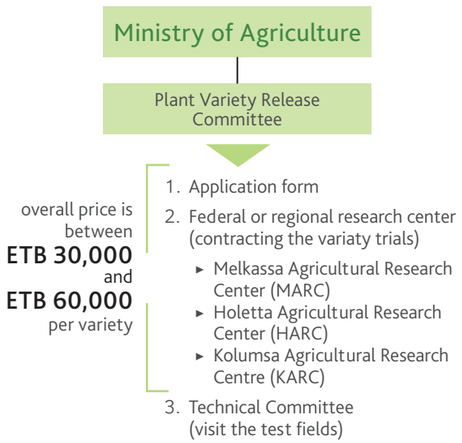
Fees for the trials are rather variable and need to be negotiated with the lead research institute. Sometimes additional fees have to be paid e.g. for inviting the Technical Committee to visit the test fields. Overall, prices have been quoted to range between ETB 30,000 and ETB 60,000 per variety (excluding the cost of additional visits by the Technical Committee).

Ultimately, it is the Technical Committee which evaluates the trials and, together with any trial data from other countries, this forms the input for the report that is submitted to the National Variety Release Committee (NVRC), whose members are selected from research institutes, universities and the Ministry of Agriculture. The NVRC convenes twice a year, once around July–September for irrigated crops and once again around January–March for rain-fed crops. Once approved, the new varieties will be included in the National Variety Register. A copy of the Register can be obtained from the Ministry of Agriculture (a copy is also available at the ISSD office in Addis).

The fact that Ethiopia has joined the COMESA seed harmonization process implies that if a variety of potato has been released by two COMESA-member countries (having undertaken trials for at least two seasons), the variety is then released in all COMESA countries.

Variety release registration





3.2 Plant Breeders' Rights

The Ethiopia Plant Breeders' Rights Proclamation (No. 481/2006) has not been implemented and the country has not put in place plant variety protection (PVP). However, a new Proclamation has been submitted to Parliament. The draft law strikes a balance between strong breeder's rights for horticultural crops (vegetables and ornamentals) while having greater farmer's rights for crops that are important for food security (cereals and legumes). At the time of writing, it was not clear in which of the two categories potato is being considered.

Ethiopia is in the process of becoming a member of the World Trade Organization (including the TRIPS Agreement), and hence a form of plant variety protection (an effective *suis generis* system) will need to be put in place. Already, the Ministry of Agriculture is preparing for the introduction of a PVP office, including capacity building for DUS (distinctness, uniformity and stability) testing.

Ethiopia is not a member of ARIPO (African Regional Intellectual Property Organization) and is not expected to join UPOV (International Union for the Protection of New Varieties of Plants) any time soon.

3.3 Import and export of seed

A permit is required for importing seed and can be obtained from the Animal and Plant Health Regulatory Services (APHRS) department of the Ministry of Agriculture. To obtain this permit, a competence certificate is required, and can be requested at the APHRS. The APHRS also provides competence certificates for companies that want to engage in seed production, processing and exporting. Though imported seed is not tested, the APHRS can undertake post-control tests[1]. In addition, a phytosanitary certificate is also required when importing seeds.

Similarly, in order to export seeds, a competence certificate and export permit are needed, as well as phytosanitary certificates. In practice, the latter requires a visit from phytosanitary inspectors to the seed company's premises for inspection.

Seed-producing companies that export solely can be exempted from variety registration[2]. This exception will be further elaborated on in the Seed Regulations (Directive). For now it seems likely that most *vegetable* hybrid-seed companies will be able to import their parental lines and export the certified hybrid seed without difficulties. At the same time, the production of legume (bean) seed, intended for export, requires registration within the country (as the variety can be in high demand on the local market).

[1] Article 15 of the Seed Law: Irrespective of the fact that a seed is supplied to market upon obtaining a certificate of seed quality, post distribution samples shall be taken and laboratory tests be conducted where there is a reason to suspect the non-conformity of the seed to the required quality standards.

[2] Seed Law (2013), Article 17 Import and Export of Seed: 1. No person may import or export seed without an import or export permit issued by the Ministry upon fulfilment of the requirements specified by directive of the Ministry. 2. Any variety of seed to be imported for multiplication purposes shall be subject to prior verification and adaptation trials as established by the National Variety Release Committee and shall be listed in the National Variety Register in accordance with this Proclamation. Provided, however, that for the purpose of strengthening the agricultural export market the Ministry shall determine by Directive the exceptional case of supplying to export market unregistered seed by multiplying or producing.

Sources of further information

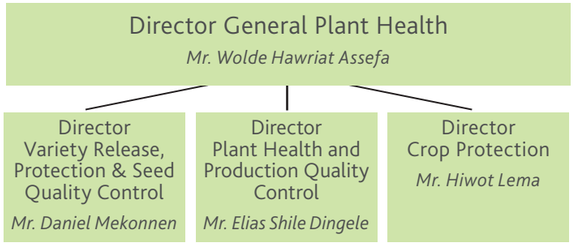
4

4.1 Public-sector partners

The most important public-sector partners are the Ministry of Agriculture (MoA), the Ethiopian Institute of Agricultural Research (EIAR) and the Agricultural Transformation Agency (ATA).

Ministry of Agriculture

The Ministry of Agriculture is responsible for the registration of varieties and provides import and export permits for seeds. The new structure of the Ministry includes one Directorate dedicated to plant health, under which a number of divisions reside. The following picture clarifies this:



Mr. Medemdemiyaw Neknike Debaleke can also be contacted regarding applications for variety registration. And with respect to phytosanitary issues, it is the Plant Health and Production Quality Control division that is responsible. For agrochemicals (e.g. the testing and registration of pesticides and biological agents) the Directorate of Crop Protection is the department in charge.

Ethiopian Institute of Agricultural Research (EIAR)

Although the processing of oilseeds in Ethiopia is most EIAR consists of 16 federal research centers and seven groups of regional research centers (for seven of the nine regional states). More information on each of the federal centers can be found at: http://www.eiar.gov.et/research-centers/federal-research-centers

The centers can be contacted directly or through the national EIAR Headquarters in Addis Ababa. Specific arrangements can be made with the centers and headquarters for variety testing and other types of applied research.

Agricultural Transformation Agency

The primary aim of the Agency is to promote agricultural sector transformation by supporting existing structures of government, the private sector and other non-governmental partners, to address systemic bottlenecks in delivering on a priority national agenda for achieving growth and food security. Programmatically, the Agency seeks to identify solutions in systemic bottlenecks in key system areas and value chains of priority cropping systems. ATA has prioritized the seed sector and is supporting key interventions in the field of quality assurance, seed marketing and the regulatory framework.

4.2 Private sector partners

Ethiopian Seed Association

The Ethiopian Seed Association (ESA) has been established to support Ethiopia's seed sector and to involve all relevant seed sector actors including national and international companies to join hands in the sustainable supply of quality seed to farmers. ESA is a young association that was officially formed under the Ethiopian seed proclamation No. 206/2000 by individuals engaged in public and private seed production, distribution, and trade. The Association has more than 20 members mainly involved in the production of field crops like maize, wheat and teff, as well as legumes like haricot bean and soybean. Full company profiles can be found on the new website of the association: https://ethiopianseedassociation.wordpress.com/company-profile/

Important agro-input dealers (at wholesale level) and producers and importers of seed are:

- Green Life Trading PLC
- General Chemicals Trading PLC
- Chemtex PLC
- Mekanba PLC
- Makobu PLC
- GAWT International Business PLC
- Markos PLC
- ETFruit
- Nirmal Seed PLC
- Eden Field Agricultural Seed Enterprise (Forage Seed)
- Advanta Seed International PLC
- SolaGrow PLC
- Rangver PLC
- Zi-Andata

4.3 Development projects

A number of development projects are in place to support the production and uptake of quality seed.

EHPEA/Horticulture Partnership

The Ethiopian Horticultural Producers and Exporters Association supports flower, vegetable and fruit exporters from Ethiopia. The Association also hosts a horticulture support project and training team. The project activities include: support for emerging commercial horticultural producers, as well as capacity building for people working in the primary horticultural sector and support services; the development and introduction of a Code of Practice for the fruit and vegetable sector; further strengthening of the on-location MSc horticultural training and support to vocational education programmes in horticulture. For more information: www.ehpea.org

Fair Planet Seeds

Fair Planet is a nonprofit organization engaged in facilitating smallholder farmers' access to seed of the highest-quality vegetable varieties. At the same time, they train farmers to use these seeds with minimal changes to their traditional production practices. Fair Planet aims to reach more than 50,000 rural households in three countries within five years. Seed companies supporting Fair Planet are East West Seeds, Enza Seeds, Hazera, Limagrain, Nickerson Zwaan and Syngenta. Fair Planet recently got an FDOV subsidy from the Netherlands government to continue and expand their activities in Ethiopia. More information: www.fairplanetseeds.com

ISSD Ethiopia

The programme on Integrated Seed Sector Development (ISSD) in Ethiopia aims to strengthen the development of a vibrant, market-oriented and pluralistic seed sector in the country, where quality seed of superior varieties is available and affordable for a large number of farmers, thereby contributing to food security and economic development in Ethiopia. ISSD recognizes the relevance of informal and formal seed systems, as well as the complementary roles of the private and public sectors. The project supports seed-producer cooperatives, and domestic and international seed companies. In addition, it provides support to the new seed regulations and their implementation, both at national and regional levels. Currently, ISSD Ethiopia works together with Enza Seeds, Koppert Biological Systems and Incotec on a number of innovations, experiments and demonstrations. More information: www.issdethiopia.org

Seed2Feed

A new project has recently been approved by the Netherlands Enterprise Agency (RVO) under the Facility for Sustainable Entrepreneurship and Food Security (FDOV). The project's consortium consists of Incotec (seed technology), Koppert Biological Systems, TradeCorps (specialized fertilizer), Rhea (agricultural mechanization), Oromia Seed Enterprise, Oromia Agricultural Research Institute and Wageningen UR – PPO (applied plant research). The objective of the project is to test and disseminate promising seed technologies focusing on teff, maize, sorghum, wheat, barley and sesame. Activities include:

- development and testing of product-service combinations
- training of 1,000 key sector specialists
- organization of 1,000 full-cycle crop demonstrations under farm conditions
- awareness campaigns inviting 200,000 farmers
- business analysis of each product-service combination
- development of business plans for each partner.

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