



TASAI

THE AFRICAN SEED ACCESS INDEX



Ethiopia Brief 2017 - The African Seed Access Index

**Edward Mabaya
Bezabih Emana
Fikre Mulugeta
Mainza Mugoya**

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INTRODUCTION

A competitive seed sector is key to ensuring timely availability of high quality seeds of improved, appropriate varieties at affordable prices for smallholder farmers in Ethiopia. This country brief summarizes the key findings of The African Seed Access Index (TASAI) study conducted in 2016/17 to appraise the structure and economic performance of Ethiopia's seed sector. With a focus on four grain crops important to food security in Ethiopia — maize, wheat, teff, and sorghum — the study evaluates the enabling environment for a vibrant formal seed sector. Cultivation of these four crops covers about 66% of the country's arable land (FAOSTAT, 2017). The study covers 20 indicators divided into the following categories: Research and Development, Industry Competitiveness, Seed Policy and Regulations, Institutional Support, and Service to Smallholder Farmers. [Appendix 1](#) summarizes all 20 indicators and compares Ethiopia to 12 other African countries where similar studies were conducted. TASAI seeks to encourage public policymakers and development agencies to create and maintain enabling environments that will accelerate the development of competitive formal seed systems serving smallholder farmers.

Overview

The seed industry in Ethiopia is divided into the informal, the formal, and the intermediate sectors. This policy brief focuses almost exclusively on the formal seed sector.

The informal sector broadly refers to the system where farmers produce, obtain, maintain, and distribute seed resources from one growing season to the next (FAO, 1998). Due to factors such as limited knowledge, lack of a wide variety of

seeds, limited resources to purchase seed, and poor access to agro-dealers, most smallholder farmers in Ethiopia still rely at least in part on informal seed systems. In cases where a farmer is unable to retain part of the harvest, or when they decide to plant a different variety, seed is generally acquired from the local community. This is particularly true for crops other than maize. Standards in the informal seed sector are not monitored or controlled by government policies and regulations; rather, they are guided by indigenous knowledge and standards and by social structures.

The formal sector focuses on breeding and evaluating improved varieties and producing and selling seed of these varieties that are certified by the Ministry of Agriculture and Natural Resources (MoANR). As Table 1 shows, Ethiopia's formal seed sector comprises numerous institutions, including government (e.g., EARS, RARIs, EIAR), universities, parastatals (e.g. Ethiopian Seed Enterprise (ESE), and regional seed enterprises), private sector (one multinational corporation and local seed companies), and development agents. The Ethiopian Seed Association (ESA) plays an important role in information sharing and advancing members' interests.

The intermediate sector is formally recognized in the Ethiopia Seed System Development Strategy developed by MoANR (ATA, 2013). The strategy document describes this sector as community-based seed production systems in which groups engage in collective seed-related activities. The main actors in this sector are community-based seed producers who grow and distribute seed that may not be certified nor fully regulated under existing laws, but is generally considered to be of higher quality seed than that produced by the informal sector.

Table 1: Role of key players in Ethiopia's formal seed sector

ROLE	KEY PLAYERS
Research and breeding	EIAR; RARIs; universities; ESE (and regional seed enterprises); CGIARs (CIMMYT & ICRISAT)
Variety release and regulation	MoANR
Production, processing, and packaging	ESE (and regional seed enterprises); local seed companies; MNCs; cooperatives
Processing and packaging	ESE (and regional seed enterprises); local seed companies; MNCs; cooperatives
Education, training, and extension	ESA, seed companies, cooperatives, extension agents
Distribution and sales	ESA, seed companies, cooperatives, agro-dealers

Key acronyms: **AFSTA** – African Seed Trade Association; **ATA** – Agricultural Transformation Agency; **COMESA** – Common Market for Eastern and Southern Africa; **DSM** – Direct Seed Marketing; **EARS** – Ethiopian Agricultural Research System; **EIAR** – Ethiopian Institute for Agricultural Research; **ESA** – Ethiopian Seed Association; **ESE** – Ethiopian Seed Enterprise; **MoANR** – Ministry of Agriculture and Natural Resources; **NVRC** – National Variety Release Committee; **RARI** – Regional Agricultural Research Institutes; **SNNP** – Southern Nations & Nationalities Peoples Region



Number of active breeders

For the four focus crops in Ethiopia – maize, wheat, teff, and sorghum – there are 74 breeders serving 15.6 million farming households. Of the 74 breeders, 23 specialize in maize, 20 in wheat, 15 in teff, and 16 in sorghum. Nearly all (72 of 74) of the breeders work in the public sector. Plant breeding and variety release is the mandate of the Ethiopian Agricultural Research System (EARS), which is comprised of the Ethiopian Institute for Agricultural Research (EIAR), the Regional Agricultural Research Institutes (RARIs), and Haramaya, Hawasa, Jimma, Bahir Dar, and Mekele Universities. Most private seed enterprises source their foundation seed from these public-sector institutions. The maize and wheat breeding programs are supported by the International Maize and Wheat Improvement Center (CIMMYT).

Two private seed companies reported having a breeder (for maize), although these breeders were not involved in any breeding program at the time of the study. One of the seed companies has breeders based outside Ethiopia. The main reason for the low number of breeders in the private sector is the lack of financial capacity to sustain a breeding program. On average, seed companies rate the adequacy of breeders as good (70%).¹ However, a notably higher level of satisfaction is registered by seed companies that have their own breeders (83%) compared to those that rely on public breeders (62%).

Varieties released in the last three years

Between 2013 and 2015, EIAR released a total of 37 varieties for the four crops: 12 for maize, 15 for wheat, 3 for teff, and 7 for sorghum. Since 2012, the three-year moving average of varieties released for maize and wheat was slightly higher than the average for teff and sorghum. The total annual number of varieties commercialized for wheat has remained higher than for the other three crops. This is due to the importance of the crop for national food security and also the repeated occurrence of foliar and stem rust diseases that led to the dis-adoption of old varieties.

Compared to other East and Southern African countries with much smaller national populations, the country's research output, as measured by number of varieties released, is low. According to several key informants, the low rate of variety release can be attributed to inadequate breeding facilities and the lack of a strong and autonomous variety release and protection system that motivates local breeders.

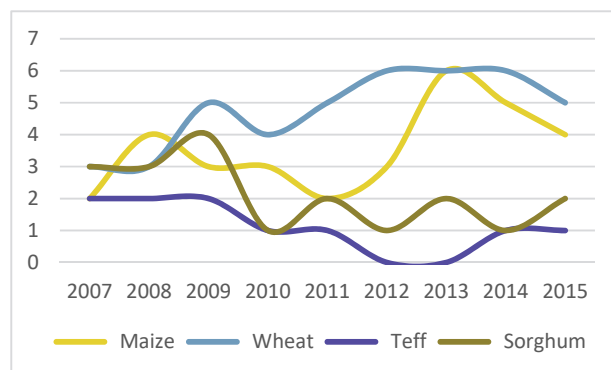


Figure 1: Number of varieties released in Ethiopia (three-year moving average)

Availability of foundation seed

On average, seed companies scored their satisfaction with the availability of foundation seed as fair (57%) across all four focus crops. By crop, seed companies' satisfaction with the availability of foundation seed is fair for teff (58%), maize (58%) and wheat (54%), and good (60%) for sorghum.

The main sources of foundation seed are the government parastatals, i.e., EARS, ESE, and five regional seed enterprises). These parastatals account for 100% of all foundation seed for wheat and teff, and at least 85% of foundation seed for maize and sorghum. Only one private seed company sourced foundation seed from outside Ethiopia.

There is no notable difference between the level of satisfaction with the availability of foundation seed between private seed companies (58%) and public seed enterprises (55%). Nevertheless, the seed companies highlighted the limited access to foundation seed as a major concern. This is consistent with the findings from the study on early generation seed (Atlaw, A., Alemu, D., Bishaw, Z., & Kalsa, 2017) that mentions low production of, and limited access to early generation seed among key challenges in the

¹ All scores reported in this brief are based on industry self-reporting of satisfaction ranging from 0% (completely dissatisfied) to 100% (completely satisfied).



seed industry. The report attributes this to limited production capacity of public institutions and private companies due to limited access to land, facilities (such as machinery and laboratories), and skilled labour.

Average age of varieties sold

On average, the varieties sold in Ethiopia in 2016 were relatively young compared to other countries covered by TASAI – between 4.8 years (for wheat) and 6.7 years (for teff). The average of maize and sorghum varieties was 5.4 years and 6 years, respectively. Note that these are simple averages since information on volume of sales for each variety is unavailable. Based on the number of companies carrying each variety, the most popular varieties are as follows: maize variety BH661, released in 2011, is sold by 10 companies, wheat varieties Danda'a and Kakaba, both released in 2010, are sold by 10 companies each, teff variety Dz-Cr-387/Quncho, released in 2006, is sold by 10 companies, and sorghum variety Gubiye, released in 2000, is sold by 3 companies. For each of the focus crops, the youngest varieties on the market in 2016 were only a year old, while the oldest varieties sold in 2016 were 10 years old for wheat, teff, and sorghum and 11 years old for maize.

Varieties with climate-smart features

To be classified as climate-smart, a variety must meet at least one of two criteria – early maturity and/or tolerance to extreme weather conditions such as drought, flooding, or frost. Most of the maize varieties (9 of 12) released between 2014 and 2016 are climate-smart, compared to less than half of the varieties for the other three crops – wheat (4 of 15), teff (1 of 4), and sorghum (2 of 7). The most prominent climate-smart characteristic – featured in all four crops – is drought-tolerance, followed by early maturity (in maize, teff, and sorghum). Most of the new wheat varieties are bred for rust resistance.

INDUSTRY COMPETITIVENESS

Number of active seed companies

In 2015, there were 60 registered seed companies in Ethiopia producing and/or marketing at least one of the focus crops. These entities included private seed companies, cooperative unions, and public seed enterprises (ESE, Amhara Seed Enterprise (SE), Southern Region SE, and Oromia SE). However, about two-thirds were either seed merchants or were inactive in 2016. Seed merchants do

not produce/market their own seed. Instead, they produce seed on behalf of other seed companies or enterprises, on a contractual basis. Only 21 seed companies met the criteria of producing and marketing seed of the four focus crops in 2016. Of the 21 seed companies, 18 produce maize, 8 produce wheat, 9 produce teff, and 3 produce sorghum.

Market share of top seed companies

The market shares of the top four companies, shown in Figure 2, reveals dominance by a few players in the seed market. For maize, the top four companies produce 81% of the seed, while the remaining 14 companies account for 19% of market share. For wheat, the top four companies produce 97% of the seed, while the remaining four companies account for only 3%. For teff, the top four companies produce 95% of the seed, while the remaining five companies account for only 5%. There are only three companies in the sorghum seed market, accounting for 100% of market share. Across the four crops, there are seven seed enterprises that make it to the top four.

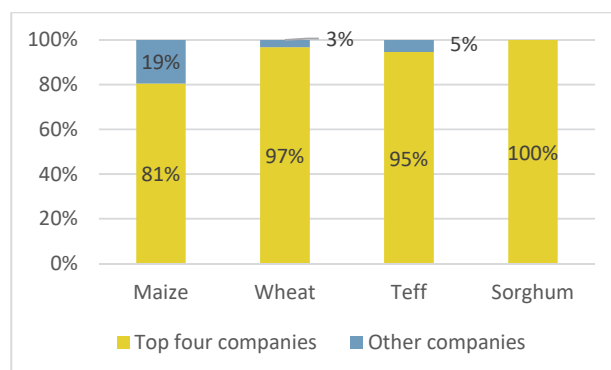


Figure 2: Total market share (%) of top four companies

The Herfindahl-Hirschman Index (a way to quantify industry competitiveness) is shown in Appendix 1. The index ranges from near zero (perfect competition) to 10,000 (pure monopoly). HHI is calculated for separately for each crop. HHI scores are good for maize (1,940) but poor for wheat (3,009), teff (3,898), and sorghum (3,337). The HHI scores are consistent with the market share calculations. The conclusion from both measures is that there are high levels of market concentration for three of the four crops – wheat, teff, and sorghum.

Market share of government parastatal

In Ethiopia, a large share of the seed market is controlled by government enterprises - ESE at the federal level and



four regional seed enterprises. In total, these five institutions account for 70% of the total seed output for the four crops. Based on self-reported seed sales data for 2016, the combined market share of government parastatals by crop is 59% for maize, 77% for wheat, 62% for teff, and 83% for sorghum. Of the countries covered by TASAI, Ethiopia has the highest presence of government parastatals involved in seed production and distribution. The Seed Sector Development Strategy states that “the mission of the public entities should be to fill gaps that private companies will be less likely to fill, namely self-pollinating varieties such as wheat and teff, and geographies that the private sector cannot reach” (Ministry of Agriculture, 2013). Indeed, the government parastatals are less active in the (mostly hybrid) maize market compared to the other (self-pollinating) crops; however, despite some merit to the above argument, the parastatals can crowd out the market and thus stifle competition and private sector investment.

Length of import/export process for seed

The time it takes to import seed is calculated as the number of days from the time an import permit is requested to the time the seed is cleared at the border. In Ethiopia, seed importation is regulated by MoANR. Only one seed company imported seed into Ethiopia in 2016. This company reported that it took more than three months to import seed, and rated the process as poor (40%).

There were no exports of certified seed from Ethiopia. Ethiopia is in the process of harmonizing its national seed regulations with the Common Market for Eastern and Southern Africa (COMESA) seed regulations.

SEED POLICY AND REGULATIONS

Length of variety release process

The length of the variety release process is the duration of time from when the application for a variety release is submitted to when the variety is released by the National Variety Release Committee (NVRC). In the past 10 years, although some private firms have emerged, government organizations remain the main player in plant breeding and variety development. The main government entity in charge of variety development, registration, and release is MoANR.

Seed enterprises reported that, on average, it takes 46 months to release a variety in Ethiopia. This long process

is attributed to constraints faced by both breeders and regulators. Key informants indicated that the MoANR has a limited budget and staff, which leads to delays in conducting field evaluations and convening NVRC meetings. Nevertheless, on average, the seed companies interviewed rate their satisfaction with the variety release process as good (71%).

Status of seed policy framework

The Ethiopia Seed Proclamation No. 782 of 2013, is the main seed policy instrument in the country. This law is an amendment to the Seed Proclamation No. 206 which was passed in 2000. The amended law introduced systematic generation and control of seed and it prescribes field and seed standards for different seed classes. The Ethiopia Seed Regulation was gazetted in February 2016 and is now fully operational. In addition to the policy and legal statutes described above, Ethiopia has a seed system development strategy that was drafted by the MoANR and the Agricultural Transformation Agency (ATA) in 2013.

The government is currently working on harmonizing Ethiopia’s laws with COMESA seed regulations, although the process is being delayed by two issues. The first is the proposed establishment of the Ethiopia Seed and Other Agricultural Inputs Authority, a semi-autonomous agency responsible for handling seed issues in Ethiopia, that is yet to be approved by the Minister of Agriculture. The second issue is that the Ethiopian government plans to conduct at least one season of testing for varieties that have already been tested in at least two other COMESA member states. The additional testing is a departure from the agreed upon procedures in the COMESA Seed Regulations.

Quality of seed regulations and enforcement

Seed quality control and certification in Ethiopia is the mandate of the seed laboratories at the Bureaus of Agriculture and Natural Resources and the Quarantine and Regulatory Authority. Seed companies rate their satisfaction with the quality of seed regulations and enforcement as good – 65% and 57%, respectively, noting that the enforcement agencies have limited capabilities in terms of laboratory facilities, vehicles, and adequately-trained personnel. In addition, they are not strategically located to cover all seed producing areas, leading to long travel times and complicated logistics for inspection.



In an effort to improve the enforcement of seed quality control, the government has established five new laboratories, with support from the Swedish International Development Agency (SIDA). The new laboratories complement the already existing eight testing facilities (two each in the Amhara, Tigray, Oromia, and SNNPR regions), established with support from the World Bank.

Adequacy of seed inspectors

There are 32 public seed inspectors in Ethiopia. In addition, several private seed companies have their own seed inspectors, though they are not licensed by the government. The role of the in-house inspectors is to monitor their company's seed quality and obtain quality assurance from the public inspectors of the Bureaus and Ministry of Agriculture and Natural Resources. Given the large size of Ethiopia and the wide distribution of seed producing regions, the number of inspectors is low compared to other countries covered by TASAI. Seed companies rate their satisfaction with the availability of seed inspection services as good (68%).

Efforts to stamp out fake seed

Seed companies received 11 reported cases of fake seed in 2016. However, this may be an under-estimate as many cases go unreported. Despite the low number, seed companies are not satisfied with the government's efforts to address fake seed, rating their satisfaction as fair (57%). Based on survey responses, the main sources of fake seeds are the seed stockists and agro-dealers, some of whom have been reported to pack and sell fake seed in areas affected by a shortage of certified seed. Notably the government has made modest efforts to combat fake seeds, including revoking trade licences for culpable parties. The MoANR regulatory directorate, with assistance from ATA, has been improving the enforcement system at the agro-dealer level through raising awareness and conducting training sessions for agro-dealers.

INSTITUTIONAL SUPPORT

Availability of extension services

According to the MoANR extension general directorate, there are approximately 18,015 agricultural extension workers in Ethiopia, of whom less than 1% (70) are from the private sector. This equates to about one extension worker for every 592 farming households in Ethiopia.

Less than one quarter (23%) of the extension workers are female. The current extension strategy assigns three development agents (or extension officers) trained in crop, livestock and natural resources per Farmer Training Centers (FTCs) or at the level of *kebele*². Seed companies are largely dependent on the government extension system, under the MoANR. Seed companies rate their satisfaction with the extension services as fair (55%), pointing out that most extension officers are not adequately informed about seed varieties and are therefore unable to provide the necessary information to farmers.

Quality of national seed trade association

The Ethiopian Seed Association (ESA) was established in 2006 and became operational in 2008. The association has 27 active members, comprising 22 private seed companies (20 of which are local), four public seed enterprises, and one cooperative union. On average, seed companies rated their overall satisfaction with the ESA as good (66%). The satisfaction rating of the association in other areas is given in Figure 3. For a relatively young seed traders' association, the rating is good but leaves much room for improvement.

In recent years, ESA has raised awareness among its members on seed-related issues in Ethiopia, and has produced and disseminated several important documents including the seed production manual. ESA works closely with the MoANR and ATA. In addition, ESA is a member of the African Seed Trade Association (AFSTA).

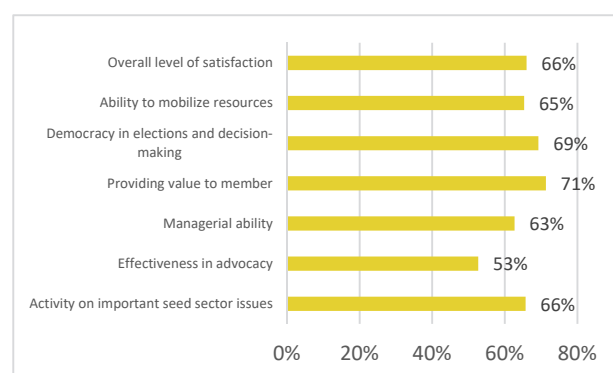


Figure 3: Members' satisfaction with ESA.

SERVICE TO SMALLHOLDER FARMERS

Concentration of rural agro-dealer network

Prior to 2011, seed distribution in Ethiopia was centralized through the federal government, with cooperatives

² *Kebele* is the lowest administrative unit in Ethiopia, equivalent to a village.



serving as the major outlet for agricultural inputs. In 2011, with support from the MoANR, ATA and the Integrated Seed Sector Development (ISSD) piloted the Direct Seed Marketing (DSM) model. Under DSM, certified seed is sold directly by seed companies (private and public) to farmers through private agents or cooperatives. The government plays a minimal role in this system.

The DSM model has achieved significant growth in coverage from two *woredas* (districts) in 2011 to 100 districts with 650 agro-dealers in 2016 (this translates to one agro-dealer for 24,294 households). However, the fast-paced growth has been accompanied by several challenges, including the need to equip agro-dealers with comprehensive information and training on seed varieties. In addition, many agro-dealers lack adequate storage facilities, and the transport infrastructure also needs improvement in many districts to better serve both agro-dealers and farmers. As a result of these shortcomings, seed companies rated their satisfaction with the agro-dealer network as fair (47%).

Availability of seed in small packages

Figure 4 shows the percentage of seed sold in different package sizes. Across the four focus crops, less than 1% of the certified seed sold in Ethiopia is sold in package sizes of 2 kg or less. The corresponding figures are 0.3% for maize and 0.6% for teff, while no wheat or sorghum seed is sold in package sizes of 2 kg or less. In fact, most seeds are sold in packages sizes of 10 kg or greater: most maize seed (89%) and almost all teff seed (95%) is sold in packages over 10 kg. All wheat seed is sold in packages of more than 10 kg. Half of the sorghum seed (50%) is sold in packages of greater than 10kg.

The most common package sizes for the crops is 12.5 kg (maize), 50 kg (wheat), 15 kg (teff), and 10 kg or 15 kg (sorghum). The reason for large package sizes for wheat is probably the high seeding rate. The converse is true for teff, which has a low seeding rate. Given that most farmers in Ethiopia are smallholders, there is need for smaller package sizes, which are more affordable for resource-constrained farmers. Nevertheless, seed companies rate their satisfaction with the availability of seed in small packages as good (60%).

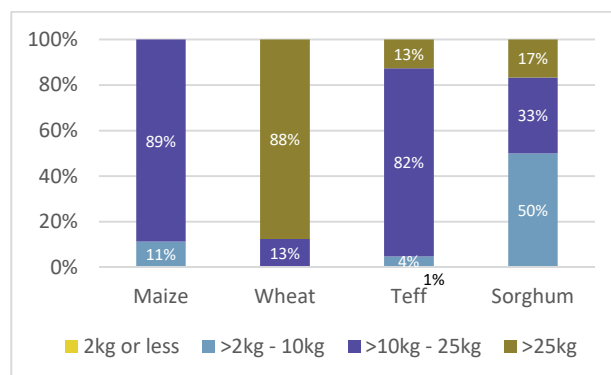


Figure 4. Percentage of seed sold in different package sizes

Seed-to-grain price ratio

Assuming stable prices at planting time, seed-to-grain price ratios can reflect the attractiveness of a variety or affordability of improved seed relative to farmer-recycled grain. The seed-to-grain price ratio is 7.1:1 for maize hybrids and 3.6:1 for maize OPVs. For the other three focus crops, the ratios are 1.4:1 (teff), 1.9 (wheat), and 2.2:1 (sorghum). The ratios show that the price of seed in Ethiopia is more expensive than in countries like Kenya (ratio of 4.5:1 for maize hybrid) and Tanzania (ratio of 5.2:1 for maize hybrid). However, it is cheaper than in other countries like Zambia (ratio of 13.4:1 for maize hybrid) and Zimbabwe (ratio of 9.3:1 for maize hybrid).

CONCLUSION

The vision and mission of the Ethiopian government's Seed System Development Strategy emphasizes the importance of a well-functioning, market-led seed sector. The seed industry has registered notable improvements over the last decade as it slowly evolves from full government control towards liberalization. There is notable increase in the number of active private local seed companies in the country; the relevant Seed Proclamations and Regulations have either been recently amended or are in the process of revision; and the government is closely collaborating with other important industry actors such as ATA, ESA, and non-state actors to address specific issues constraining the sector. All these developments bode well for the seed industry.

However, significant challenges remain in Ethiopia's formal seed sector. Chief among these (and reported by more than half (53%) of seed producers) is the limited availability and poor quality of early-generation seed. Unlike most other countries covered by TASAI, the Ethiopian government continues to be heavily involved in all stages of the



seed value chain. This not only stifles competition, but also gives rise to the perception by almost half (40%) seed producers that public seed entities get higher priority by government agencies than private seed companies. Regardless of whether this favouritism is real or imagined, it discourages private sector investment in the seed sector. While direct seed marketing is a positive step towards relinquishing government control of seed distribution, there is a need to fast-track its roll-out across the country. The roll-out should be complemented by strengthening agro-dealer networks and co-operatives through providing up-to-date information on varieties and training on seed marketing.

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APPENDIX 1.

For a comparison of TASAI Indicators across 13 countries, please visit: <http://tasai.org/wp-content/uploads/TASAI-Appendix-CURRENT.pdf>





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info@tasai.org

www.tasai.org

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