## INTRODUCTION

A competitive seed sector is key to ensuring timely availability of appropriate, high quality seeds at affordable prices to smallholder farmers in Uganda. This policy brief summarizes the key findings of a major study conducted in 2013 and 2014 to appraise the structure and economic performance of Uganda's seed sector. The study was conducted by two local seed industry experts Mr. Chris Ibyisintabyo and Mr. Emmanuel Mubangizi. With a focus on four grain crops that are important to food security in Uganda – maize, bean, millet and sorghum – the report evaluates the enabling environment for a competitive seed sector and covers 16 indicators that are divided into the following categories: Research and Development, Industry Competitiveness, Service to Smallholder Farmers, Seed, Policy and Regulations, and Institutional Support. To give perspective, in this brief the performance of Uganda's seed sector is compared against three other countries, namely Kenya, South Africa, and Zimbabwe, where similar studies were conducted under a new initiative called The African Seed Access Index (TASAI). TASAI seeks to encourage public policy makers and development agencies to create and maintain enabling environments that will accelerate the development of local private sector-led seed systems serving smallholder farmers. Details on research methods and other country briefs are available online at www.tasai.org.

## OVERVIEW

Like most other African countries, the seed industry in Uganda consists of two systems: the informal sector and the formal sector. This policy brief focuses almost exclusively on the formal seed sector.

**The informal sector** broadly refers to the system where farmers produce, obtain, maintain, develop, and distribute seed resources, from one growing season to the next (FAO, 1998). Because of limited exposure, inability to purchase seeds, limited access to agro-dealers, or other reasons, some smallholder farmers in Uganda still rely on informal seed systems. The steps in the informal seed system are not monitored or controlled by government policies and regulations; rather they are guided by indigenous knowledge and standards. Under Uganda's informal sector, much of the seed is saved and/or exchanged by farmers.

**The formal sector** focuses on breeding, producing, and selling seed that is certified by the National Variety Release Committee (NVRS). NVRS conduct official seed certification on behalf of the Ministry of Agriculture. As shown in Table 1, Uganda's formal seed sector is comprised of many different institutions including the government, (e.g., NARO, NARS, NVRC, NAADS, ATAAS, and NSCS); the private sector (e.g., Pannar Seed, Seedco, East Africa Seeds Ltd., FICA Seeds, etc.), member associations (e.g., UNADA and USTA); as well as NGOs, development agencies, and farmer cooperatives.

***Table 1: Role of key players in Uganda formal seed sector***

| ROLE | KEY PLAYERS |
|---|---|
| Research and breeding | NARO; NARS; MNCs |
| Variety registration & regulation | NVRC; NSCS |
| Breeders and foundation seed production | NARS; NARO; MNCs; Local seed companies |
| Seed production | Local seed companies; MNCs |
| Processing and packaging | Local seed companies; MNCs; agro-dealers |
| Education, Training, Extension | NGOs; NAADS; local government; ATAAS; rural agro-dealers |
| Distribution and sales | Seed companies; rural agro-dealers; farmer cooperatives; NGOs |

**Key Acronyms: ATAAS –** Agricultural Technology and Agribusiness Advisory Services; **AFSTA** - Africa Seed Trade Association; **MNC** – Multinational Corporation; **NARO** – National Agricultural Research Organization; **NAADS –** National Agricultural Advisory Services; **NARS** – National Agricultural Research System; **NGO** – Non Governmental Organization; **NSCS** – National Seed Certification Services; **NVRC** – National Variety Release Committee; **UNADA -** Uganda National Agro-Input Dealers' Association; **USTA –** Uganda Seed Trade Association

***Table 2: Uganda's formal seed sector compared to other African countries***

| COUNTRY PROFILE | | | KENYA | SOUTH AFRICA | UGANDA | ZIMBABWE |
|---|---|---|---|---|---|---|
| Focus crop 1 | | | Maize | Maize | Maize | Maize |
| Focus crop 2 | | | Sorghum | Soybean | Beans | Cotton |
| Focus crop 3 | | | Beans | Sunflower | Millet | Soybean |
| Focus crop 4 | | | Cowpeas | Wheat | Sorghum | Sorghum |
| Population (Million) | | | 43 | 51 | 36 | 13 |
| Size ($KM^2$) | | | 569,250 | 1,214,470 | 197,100 | 390,760 |
| Arable land (Million Ha) (% of size) | | | 4.89 | 14.8 | 5.3 | 3.58 |
| 2014 Ease of Doing Business rank (Rank out of 189) | | | 136 | 43 | 150 | 171 |
| Stage of seed sector development | | | Growth | Mature | Growth | Decline |
| A. RESEARCH AND DEVELOPMENT | | | | | | |
| 1 | Number of active breeders | Total | 68 | 53 | 11 | 40 |
| | | Score | -- | 43.3 | 36.3 | 79.1 |
| 2 | Varieties released in last 3 years | Total | 60 | 310 | 19 | 35 |
| | | 3 year average | 20 | 103 | 6.3 | 11.7 |
| 3 | Availability of foundation seed | Score | 61.3 | 91.3 | 42.8 | 99.3 |
| B. INDUSTRY COMPETITIVENESS | | | | | | |
| 4 | Number of active crop seed companies for focus crops | Total | 17 | 37 | 14 | 20 |
| 5 | Time it takes to import/export seed from neighboring countries (days) | Import seed | 26 | 38 | 48 | 12 |
| | | Export seed | 12 | -- | 18 | 12 |
| | | Score | 58.9 | 68.7 | 55 | 68 |
| 6 | Market share of top 4 companies, Herfindahl-Hirschman Index | Crop 1 | 6,450 | 2,489 | 1,509 | 2,734 |
| | | Crop 2 | 1,989 | 3,625 | 950 | 10,000 |
| | | Crop 3 | 3,223 | 2,473 | 1,350 | 5,393 |
| | | Crop 4 | 3,240 | 4,816 | 1,050 | 3,027 |
| 7 | Market share of government parastatal | % mkt share | 62.4 | 0 | 0 | 2.5 |
| C. SERVICE TO SMALLHOLDER FARMERS | | | | | | |
| 8 | Concentration of rural agro-dealer network | Score | -- | 55 | 49 | 70.2 |
| 9 | Availability of seed in small packages | % volume sold | 94.4 | 2.5 | 29.1 | 7.8 |
| | | Score | -- | 30.8 | 50 | 63.4 |
| D. SEED POLICY AND REGULATIONS | | | | | | |
| 10 | Length of variety release process | Time (months) | 37 | 12 | 37 | 22 |
| | | Score | 32.7 | 81.0 | 55.8 | 92.2 |
| 11 | Quality of seed policy framework | Score | 65.2 | 82.7 | 47 | 65.5 |
| 12 | Quality of seed law / regulations | Score | 60.9 | 70 | 44.2 | 87.3 |
| | Quality of enforcement systems | Score | 53.1 | 70 | 41.4 | 83 |
| 13 | Adequacy of seed inspectors | Total inspectors | 60 | 148 | 4 | 68 |
| | | Score | 63.8 | -- | 43.5 | 82.3 |
| 14 | Efforts to stamp out fake seed | Reported cases in 3 yrs | 36 | 17 | -- | 41 |
| | | Score | 38.5 | 60 | 40.6 | 66.9 |
| E. INSTITUTIONAL SUPPORT | | | | | | |
| 15 | Availability of extension services for smallholder farmers | Ratio to farmers | 1:1000 | 1:3313 | 1:3140 | 1:300 |
| | | Score | -- | 35.2 | 45 | 63.6 |
| 16 | Quality of national seed trade association | Score | 53.4 | 91.5 | 60.6 | 43.2 |

**KEY**

| Score | 80 to 100 | 60 to 79.99 | 40 to 59.99 | 20 to 39.99 | 0 to 19.99 |
|---|---|---|---|---|---|
| Grade | A | B | C | D | F |
| Color Code | | | | | |
| Interpretation | Excellent | Good | Fair | Poor | Extremely poor |
| H-4 Index | <1000 | 1000-1999 | 2000-2999 | 3000-3999 | >4000 |

## RESEARCH AND DEVELOPMENT

### Number of active breeders

The National Agricultural Research Organization (NARO) is the leading public organization responsible for research and development. Within NARO, the National Crop Resources Research Institute (NaCRRI) is responsible for breeding programs for maize, rice, common beans, soybean, sweet potatoes, and cassava. For the four focus crops, there are 11 active breeders six for maize (4 public and 2 private), two for beans (both public), one for millet (public), and two for sorghum (both public). Maize breeding receives more attention compared to other crops due to its significant donor support. Training of breeders and investment into research and development are still beyond the means of most local seed companies in Uganda. The few breeders that have been trained work for international organizations such as International Centre for Improvement of Maize and Wheat (CIMMYT) and tertiary institutions outside Uganda.

### Varieties released in the last 3 years

Of the four focus crops, only 12 maize varieties and 7 bean varieties have been released in the three-year period from 2011 to 2013. (Figure 1 shows the number of varieties released each year.) However, many more varieties are in the pipeline: a new breeder is scheduled to release at least 10 varieties of finger millet in 2014, and National Crop Research Resources Institute (NaSARRI) is evaluating elite sorghum materials. In the case of maize, additional seed companies are planning to release their own varieties, adding to the existing varieties. Both sorghum and millet are only developed through public research and sustaining breeder and foundation seed production depends on the availability of funds from government and donors. The number of varieties released each year is expected to increase over the next couple of years due to high demand for new seed varieties and increasing donor support to research and development activities.

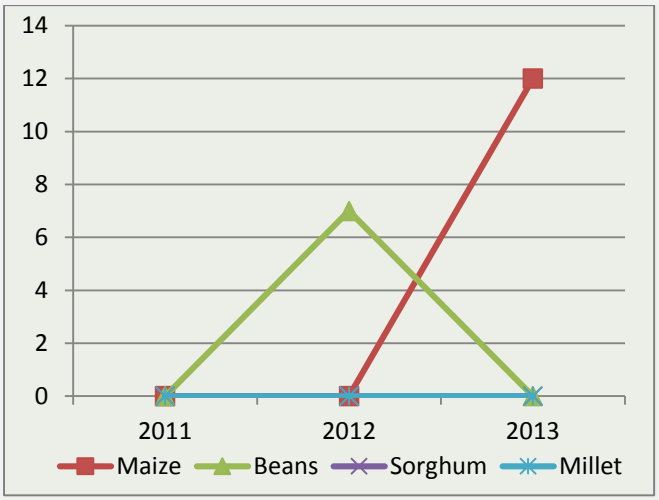


*Figure 1: Number of varieties released*

### Availability of Foundation seed

Most seed companies obtain their foundation seed from breeders at the NAROs. However, the TASAI survey found that some of the more established seed companies in Uganda (e.g., NASECO, FICA Seeds, East African Seeds Ltd., and Victoria Seeds) obtain breeder seed from the researchers and multiply it into foundation seed and then sell it to other seed companies.

Seed companies face various challenges while trying to access foundation seed, which include a total lack of foundation seed for certain varieties, inadequate volumes of breeder seed from breeders. The NARO and its constituent research institutes depend on funds released by government annually, and most of the time these funds are not adequate. There is also lack of coordinated planning and information sharing between breeders and seed companies. Seed companies often do not make good projections to enable proper planning by breeders, and this creates a shortfall in the production of breeder seed, subsequent affecting the production of foundation seed. The survey also found that sometimes breeders do not have adequate facilities to maintain their foundation seed farms, which can lead to low quality foundation seed. For all these reasons, the seed companies surveyed rated the overall availability of foundation seed for the focus crops as "fair" at 42%. However, the four crops vary in terms of availability of foundation seed: maize was rated "good" at 68%, while millet was rated the lowest – "extremely poor" at 18%.

## INDUSTRY COMPETITIVENESS

### Number of active seed companies

The first seed company in Uganda was registered in 1996 and since then the number of seed companies has grown to over 25 in 2013. Out of the 25 seed companies, 23 are members of the Uganda Seed Trade Association (USTA). An assessment of the seed companies indicated that 14 (54%) are active in the focus crops. Despite the steady growth in the number of registered seed companies in the last 10 years, the number of active seed companies is still low. Despite efforts by local entrepreneurs to start seed enterprises in the country, almost half of them have experienced limited growth due to low financial base and low management skills in the seed business.

### Time it takes to import seed

On average importing seed takes longer than exporting it - 48.3 days compared to 17.5 days. The main reason for the longer importation period was that most seed imports come from India, South Africa, and Australia – countries that are far and where the process involves lots of paperwork. In contrast, seed exportation takes less time because seed exports mainly go to neighboring countries like South Sudan, Rwanda, and Tanzania, which are all under the East African Harmonized Seed Import Export Regulations. Both

import and export processes were rated as “good” at 55% and 66%, respectively.

### Market share of top seed companies

The market shares of the top seed companies for each crop are illustrated through pie charts in Figure 2. These estimates are based on volume (not value) of seed sales for the two cropping seasons in 2012. The seed maize market is the most competitive with the top four companies commanding an almost equal share of about 21% each. Millet is the least competitive crop with one company commanding a 50% share and the second largest company commanding 30% market share. As measured by the Herfindahl-Hirschman Index per crop, Uganda is the most competitive of all the four countries. However, unlike the other countries, the same four companies are the top 4 largest companies for all crops. As a result, when one looks at the overall seed market across crops, Uganda is not very competitive.

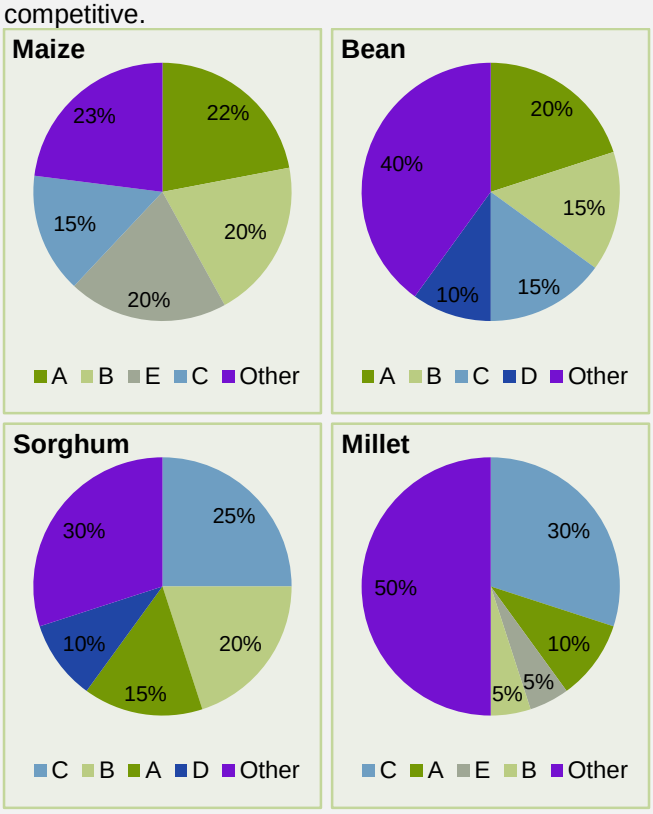


*Figure 2: Seed volume market shares for focus crops*

### Market share of government parastatal

The seed industry has undergone a number of changes from being a purely public-led industry to a now fully private-led seed industry. The Uganda Seed Project (USP) transformed into a commercial entity and was converted into a limited liability company in 1999; Uganda Seeds Limited (USL). After liberalization, both local and multinational seed companies came into the market and significantly reduced the market share of USL. USL was later on leased out to two private seed companies in 2005 and since then ceased all seed production and marketing.

## SERVICE TO SMALLHOLDER FARMERS

### Concentration of rural agro-dealer network

According to the agro input dealer census conducted in 2009 by UNADA and AT Uganda, there were 2,064 agro-dealers in the country (UNADA, 2009). About 37% of the agro-dealers identified in the census were in urban areas, while the other two-thirds were in the rural areas. In 2013, the estimated number of agro- dealers is about 2,600. Considering the number of farmers in the country, this number is small: the ratio of agro-dealer to farmer is about 1:3,400 or less. Access to seed in many rural areas of Uganda is still limited because of high transport costs affecting both farmers and agro-dealers. Agro-dealers usually lack adequate capital to purchase large volumes of seed to warrant hiring of transport to deliver seed to rural areas. The road network in many rural areas of the country is very poor, which makes access to rural areas more difficult, especially where communities are sparsely distributed. Seed companies rated the concentration of agro-dealers as “fair” at 49%.

### Availability of seed in small packages

As measured by volume, the amount of seed available in packages that smaller than 5 kg for each of the focus crops is as follows: maize 22%, beans 36%, millet 5% and sorghum 55%. The availability of seed in smaller packages is rated by the industry as “fair” at 50%. Seed companies can still improve access by smallholder farmers by selling more seed in packages smaller than 5kgs that can be afforded by the millions of smallholder farmers in rural areas. Although discussions with seed companies indicated that packing seed in smaller packages increases the cost of packaging, making the small packs available to the smallest subsistence farmers will go a long way to provide access to seeds while minimizing the chance of seeds being repackaged, which often leads into adulteration.

## SEED POLICY AND REGULATIONS

### Length of variety release process

The introduction of new field crops into Uganda from within or outside require confirmatory tests for Value for Cultivation and Use (VCU) and Distinctness, Uniformity and Stability (DUS). In addition to the long period of variety development, all new varieties undergo two seasons of testing before they can be registered and released as new varieties. Maize, beans, finger millet, sorghum and other field crops require two seasons of testing to determine value for cultivation and use (Seeds and Plant Act, 2006:12). Seed companies from outside Uganda find this process to be cumbersome and many prefer investing in countries without release processes. The cost and time to register new varieties are especially significant for new seed companies, which limits the flow of new varieties into the market. There are two specific costs for DUS and VCU, and the costs of testing per season run about USD150 per variety per site. The variety will have been tested in at least 6 sites and on farm with farmers in the suitable ecological zone for two seasons. (Source: Cereal Program, NaCRRI).

The average period it takes to release a new variety is 3 years for maize, 2.5 years for beans, and 5 years for sorghum. The industry satisfaction with the release

processes for each of the focus crops was as follows: maize 60%, beans 55%, millet 50%, and sorghum 59%.

### Quality of seed policy framework

On average the seed policy was rated as 47% and considered poor. This is mainly attributed to the fact that Uganda does not have a final policy document that guides the development of the seed sector in the country. The consultative processes have been very slow and not all stakeholders have been consulted for their input into the seed policy. It is likely that the current draft seed policy will be reviewed to broaden its scope when more stakeholders are involved.

### Quality of seed regulation and enforcement

On average the quality of the seed law and regulations were rated "fair" at 44%. While the Seed Act of 2006 is in place, enforcement of the law is poor. Many players in the seed value chain have not been educated on the Seed Act. The seed regulations have been in draft form since 2008 and the lack of NSCS personnel and low levels of accreditation have been raised during several stakeholder fora for likely future low levels of implementation. These regulations were cleared by the office of the solicitor general recently but are yet to be accented to by the Minister of Agriculture. In general, regulation and enforcement of the seed laws are weak due to a lack of capacity and poor training of officers responsible for seed certification at the Ministry of Agriculture. Currently enforcement of seed laws is highly centralized at the exclusion of local enforcement officers and district agricultural officers.

### Adequacy of seed inspectors

In Uganda, seed inspection services are provided by the National Seed Certification Services (NSCS). This section is understaffed with only four seed inspectors covering 25 seed companies and over 900 seed growers. The government recently recruited 30 more inspectors but they are involved in phytosanitary inspections and the inspection of agricultural chemical dealers. The four seed inspectors are based at the Ministry of Agriculture, Animal Industries and Fisheries (MAAIF) headquarters and do not regularly visit the seed fields around the country. As a result seed companies are not inspected properly by government inspectors and are forced to inspect largely remain poorly inspected by the current number of inspectors, contributing to poor quality seed on the market. Among the companies interviewed by the TASAI survey, the average score for availability of inspection services was 43.5%, with a wide range between 30% and 80%.

### Efforts to stamp out fake seed

The costs to the seed sector of fake seed are many and include the cash losses to buyers, low productivity and crop loss, and declining agricultural production. Fake seeds have become a national concern in Uganda. Addressing this challenge requires a common purpose, strategy, and resources by all stakeholders. The average score for the government efforts to stamp out fake seed was rated at barely "fair" at 40.6%. The low rating is attributed to a number of factors including inadequate staff at the ministry level to monitor and apprehend those involved in dealing in fake seeds in the market. Corruption is also blamed for the high levels of fake seeds on the market.

## INSTITUTIONAL SUPPORT

### Availability of extension services

In Uganda there are 2,354 sub-county extension officers under the NAADS program, and each of the 112 districts in Uganda has at least a district NAADS coordinator, district production coordinator, a district agricultural officer, and a district veterinary officer. This brings the number overall to about 2,802 extension workers directly interacting with farmers. The ratio of extension workers to farmers to 1:3,140.This number excludes extension workers from the private sector, NGOs, donors, farmer organizations, and cooperatives. Uganda's extension system has various challenges including inadequate funding to facilitate extension work, inadequate numbers of trained professionals, and low salaries.

### Quality of national seed trade association

The Uganda Seed Trade Association (USTA) is a membership association formed in 1999 to coordinate and oversee the development of the seed industry and to enhance the availability of quality assured seed for the entire farming community locally, regionally and internationally. With a total of 27 registered members, of which 23 are ordinary members (seed companies) and 4 Associate members, USTA covers a total of more than 90% of the seed companies registered in Uganda. The average rating of USTA by seed companies was "good" at 60.6%. Score for USTA's competency in specific areas is as follows: activeness is rated at 58.8%, effectiveness in advocacy is rated at 56.9%, managerial ability is rated at 62.5%, democracy in elections and decision making is rated at 80%, and capacity to mobilize resources is rated at 45%.

## CONCLUSION

Uganda's seed sector is fully liberalized but is still in the early stages of growth. Per focus crop, Uganda is more competitive than all of the other three countries (South Africa, Zimbabwe, and Kenya). Without a single company dominating the market, price competition is fierce, leading to lower prices for farmers. However, the seed sector still relies on a poorly performing public sector breeding program. The number of active breeders is very low and access to foundation seed is limited. With serious staff shortages, government department are unable to cope with the growing demands of the private sector. This has led to a weak seed policy and regulatory framework. A clear sign of this is the problem of fake seed, which continues to grow and could derail the industry if left unchecked. However, the private sector has a strong momentum and is pushing towards more self-regulation and self-reliance. There are strategies in place to address most of the key choke points along the seed value chain. In short, despite its challenges, Uganda's seed sector shows great promise for a vibrant, private sector-led seed system that will guarantee timely availability of

appropriate, improved varieties to smallholder farmers at affordable prices.

## REFERENCES


Food and Agriculture Organization of the United Nations (FAO). (1998). Seed and Plant Genetic Resource Services: Developing Seed Security Strategies and Programmes for Food Security in Developing Countries. In Proceedings of the International Workshop on Seed Security for Food Security, 30 November to 1 December 1997. Florence, Italy.

Ibyisintabyo, Chris and Emmanuel Mubangizi. (2014). The African Seed Access Index Country Report on Uganda.

National Crop Research Resources Institute (NaCRRI). Cereal Program.



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