



INTRODUCTION

A competitive seed sector is key to ensuring timely availability of high quality seeds of improved, appropriate varieties at affordable prices to smallholder farmers in Kenya. This country brief summarizes the key findings of a major study conducted in 2013 and 2014 to appraise the structure and economic performance of Kenya's seed sector (REMPAI, 2014). With a focus on four grain crops that are important to food security—maize, sorghum, beans and cowpea—the study evaluates the enabling environment for a vibrant formal 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, this brief compares the performance of Kenya's seeds against three other countries, namely South Africa, Uganda 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 competitive seed systems serving smallholder farmers. For details on research methods, visit www.tasai.org.

OVERVIEW

Like most other African countries, the seed industry in Kenya 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, low availability of most varieties, inability to purchase seeds, limited access to agro-dealers, or other reasons, most smallholder farmers in Kenya still rely at least in part on informal seed systems. In cases where the farmer is unable to retain part of the harvest, or where a farmer decides to plant a different variety, seed is generally acquired from the local community, including markets as well as farmers' social networks. This is true particularly for non-maize crops. Standards in the informal seed systems 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 is certified by the Kenya Plant Health Inspectorate Service (KEPHIS), the government entity responsible for regulating seed in Kenya. As shown in Table 1, Kenya's formal seed sector comprises many institutions including government (e.g., KALRO, KEPHIS, public universities, and county extension agents), parastatals (e.g., Kenya Seed Company, Simlaw, KALRO Seed Unit), private sector (MNCs and local seed companies), and development agents (NGOs and CBOs). Associations such as Plant Breeders Association of Kenya and the Seed Trade Association of Kenya (STAK), when active, also play an important role in information sharing and advancement of members' interests.

Table 1: Role of key players in Kenyan formal seed sector

ROLE	KEY PLAYERS
Research and breeding	KALRO; universities; MNCs; local seed companies
Variety release & regulation	KEPHIS
Breeder and foundation seed production	KARI; Universities; MNCs; local seed companies
Seed production	KALRO, local seed companies; MNCs; community organizations
Processing and packaging	KALRO Seed Unit, local seed companies; MNCs
Education, training, extension	Seed companies, extension agents, NGOs, rural agro-dealers
Distribution and sales	Private sector seed merchants; Kenya Seed Company, KALRO Seed Unit and other parastatals, rural agro-dealers; NGOs

Key Acronyms: **AFSTA** - African Seed Trade Association; **CBO** - Community Based Organization; **KALRO** - Kenya Agriculture and Livestock Research Organization; **KEPHIS** - Kenya Plant Health Inspectorate Service; **MNC** - Multinational Corporation; **NGO** - Non Governmental Organization; **STAK** - Seed Trade Association of Kenya



Table 2: Kenya'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 crop only	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

For the focus crops (maize, sorghum, beans and millet), Kenya has only 40 public and 28 private active breeders serving over 6 million farming households who rely on agricultural activities for their livelihoods (KNBS, 2013). Of the 68 breeders, 25 specialize on maize, 10 on sorghum, 22 on beans and 11 on cowpeas. Further, discussions with seed sector stakeholders highlighted acute scarcity of breeders outside of the four focus crops, and revealed that as a result, several scientists are engaged in the breeding of more than one crop, often in areas outside their core specialization. The limited breeding capacity limits the number of crop varieties available, thus reducing competition in the seed market. This is especially true given that most of the available varieties may be patented and licensed to only one seed company. Kenya's wider agro-ecological diversity also translates to more work for breeders.

Varieties released in the last 3 years

In the three years from 2011 through 2013, the following number of varieties of the four focus crops were released: maize 35, common and climbing beans 10, sorghum 15, cowpeas 0. As seen in the figure below, the latest three-year moving average of maize varieties released is about 12. Although there is no clear trend, the releases for all seed varieties picked up somewhat between 2008 and 2011 (see Figure 1 below). Kenya outperforms Uganda and Zimbabwe on number of varieties released, but lags far behind South Africa.

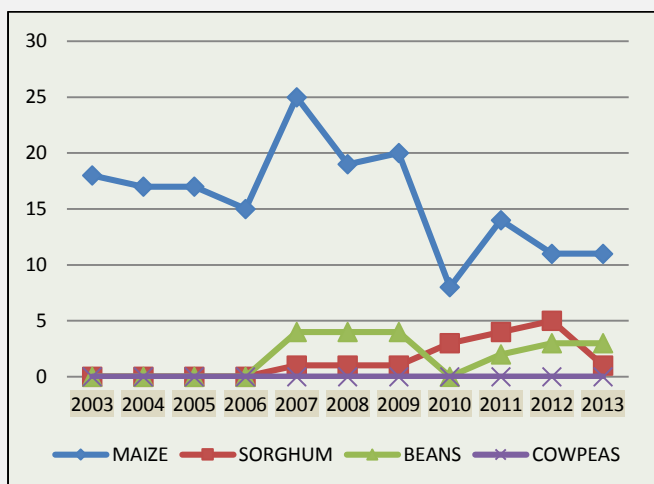


Figure 1: Number of varieties released in Kenya (three year moving average)

Over the years, maize breeding has been given more attention than other crops. For example, over the last decade, there is not a single cowpea variety that has been released in Kenya. This is in part because maize is the most widely cultivated crop in the country, given its importance for food security. Also, the productivity of hybrid maize declines significantly whenever seed is recycled, unlike the beans and cowpeas that are openly pollinated. Such "ability to recycle" lowers demand for bean and cowpea seed thereby discouraging investment in pulses.

Availability of foundation seed

Seed companies scored their satisfaction with the availability of foundation seed at 61.3% on average. (All scores reported in this brief are based on industry self-reporting of satisfaction.) While this is rated as "good," it is important to take a closer look at the numbers. Of key concern is that minimum scores for this indicator were 40% or lower for all four crops. The rating varies widely according to the crop and seed producing companies. Some companies have their own teams of breeders, as well as relevant facilities and germplasm to produce their own foundation seed. This is particularly true for multinational companies, which largely import their parent seed. By contrast, most small- and medium-sized companies rely on public research institutions for their foundation seed. Satisfaction with availability of foundation seed drops significantly when only the local, KALRO-reliant, companies are considered. The study also finds that seed companies with a historical link to government have better access to foundation seed.

INDUSTRY COMPETITIVENESS

Number of active seed companies

The number of registered seed companies in Kenya has grown from one (the Kenya Seed Company registered in 1956) to 116 since liberalization of the seed subsector in 1996. However, the number of active seed companies involved in the production and distribution of seed for the focus crops is only 17. The majority of the registered seed companies are actually seed merchants that are not involved in seed production or any breeding activities. They import seed, often for their own commercial agriculture activities, and do not distribute seed outside of their own commercial production enterprises. Maize seed is currently being produced by 16 companies (four being parastatals), sorghum by eight companies (three being parastatals), beans by eight companies (four being parastatals) and cowpea by six companies (two being parastatals). All seed companies surveyed thought that there was still room for more seed companies.

Time it takes to import seed

The time it takes to import seed is rated by seed companies as fair at 58.9%. On average, it takes 26 days for imports and 12 days for exports. The difference in length of time for import versus export of seed reflects the more stringent import requirements for Kenya compared to its trading partners. While there is room for improvement on the seed import process, this indicator compares favorably against countries with more advanced seed sectors such as South Africa. To reduce threats arising from transmission of plant diseases and pests, Kenya has internationally acceptable phytosanitary procedures for seed import and export. Currently, Kenya imports maize and sorghum seed. It takes about 40 days to import seed from parent companies, mostly based in South Africa. In 2012, Kenya exported about 2,332 MT of seed. Most of Kenya's seed exports go to Burundi, DRC, Rwanda, Somalia, South Sudan, Tanzania and Uganda.



Market share of top seed companies

The market shares for companies producing maize, beans and cowpeas are represented on pie charts in Figure 2 below (note that each color denotes the same company across all crops). The Herfindahl-Hirschman Index (a way to quantify industry competitiveness) is also given in Table 2 (the index ranges from near zero for perfect competition to 10,000 for pure monopoly). Both indicators show an industry that is dominated by a few large players. The worst performance is in maize, where one company commands 80% market share (a government parastatal). The beans and cowpea markets are also characterized by low levels of competitiveness with nearly half of the market controlled by one company. Only the sorghum market can be considered to be reasonably competitive.

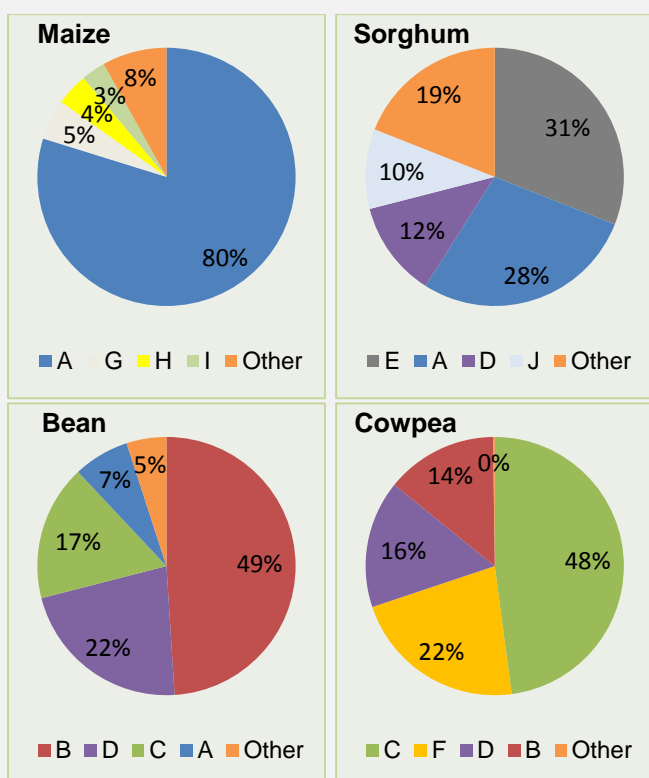


Figure 2: Seed volume market shares for staple crops

Market share of government parastatals

Compared to other countries in this study, Kenya has a very high seed market share that is still controlled by current or past government parastatals. For the four study crops, it was established that one government-connected seed company dominates the maize market, ranks second in sorghum and fourth in beans, where its subsidiary has the highest market share. It was also established that the same company collaborates with National Cereals and Produce Board (NCPB) in seed distribution, using the name and country-wide infrastructure (e.g., stores) of the latter. While there are no regulatory encumbrances to entry into the Kenyan seed sector, private sector participants have clearly stated that the dominance of state-supported players is discouraging to potential investors.

SERVICE TO SMALLHOLDER FARMERS

Concentration of rural agro-dealer network

The recently launched Seed Sector Platform KENYA (www.seedsectorplatformkenya.com) lists over 6,700 agro-dealer shops, many of which are licensed by KEPHIS. It is estimated that there are over 12,000 agricultural input stockists in total, but many of these are not licensed. It is common in Kenya to find small towns and markets having more than one agro-dealer, commonly referred to as agro-vets, given their involvement in both agricultural and veterinary inputs. Most of the agro-dealers sampled for this study sold seeds. Despite the relatively high number of agro-dealers in the country, farmers often travel 3 to 10 km to access agricultural inputs (AGRA, 2010).

Availability of seed in small packages

Kenyan seed companies outshine other countries in their ability to avail seed in small packages suitable for smallholder farmers. This indicator is rated as excellent, with 94.4% of the total volume of seed sold in Kenya sold in packages less than 5 kg. Small packages are an important incentive to promote the utilization of certified seed among smallholder farmers. Most of the sales (about 74%) in the agro-dealer shops are in 2kg packages. Kenya's smallholder farmers account for over 75 percent of the total agricultural output and about 70 percent of marketed agricultural produce. They work land sizes of about 0.2-3.0ha. Given the seed rate for different crops, such smallholder farmers often demand small packages in order to minimize surpluses that may go to waste. Small packages also allow smallholder farmers to experiment with different varieties of the same crop.

SEED POLICY AND REGULATIONS

Length of variety release process

It takes an average of 37 months for a variety to go through the release process, which was rated "poor" by seed companies, with an average rating of 32.7%. The length of the release process depends on administrative as well as agro-climatic conditions in the trial area. Administrative constraints could arise from both the breeder and the regulator's actions. For instance, the breeder could delay submitting information required by the regulator or the National Variety Release Committee (NVRC) could fail to meet as required. Considering the combined effect of both the administrative and agro-climatic factors, the variety release period in Kenya ranges from 2 to 4 years for all crops. The average period, based on information from this survey, is 3 years. This measure is similar to Uganda but higher than the two-year average for Zimbabwe and one-year for South Africa.

Quality of seed policy framework

The seed industry scored the quality of Kenya's seed policy framework as "good" with a 65.2% rating. The Kenya National Seed Policy only came into force in August 2010, and given the relatively short period in which the policy has been in force, its effectiveness may not yet be clear to most stakeholders. For example, revised regulations have not yet been agreed

upon or implemented. That said, the seed sector players see its enactment as an important and positive step, especially on matters of self-regulation, which would allow the private sector to play some regulatory roles, thus reducing the burden on KEPHIS. Of the four countries compared, Kenya's seed policy framework has the second highest score behind South Africa.

Quality of seed regulation and enforcement

The seed industry rates Kenya as good for regulations (60.9%) and fair for enforcement (53.1%). Seed producers indicated that most arrests are not successfully prosecuted due to weak investigations, coupled with corruption within the national police force. The Plant Varieties Act has been reviewed a number of times with the most recent amendment published in January 2013. One of the key elements introduced in the act is the leeway for the regulator to authorize some private persons to handle some of the functions initially confined to the regulator. This is intended to improve efficiency in the industry.

Adequacy of seed inspectors

Private seed companies put satisfaction with the availability of inspection services at an average of 63.8%. The main seed regulatory agency (KEPHIS) employs hundreds of staff, about 60 (15%) of whom are involved in seed inspections. To ensure effectiveness and efficiency in service delivery, KEPHIS has distributed inspectors to various sites, including all formal border points and international airports. Also, KEPHIS may, in consultation with the very active seed companies, set up a desk/office within their premises. Regarding KEPHIS as an institution, most of the seed producers were largely satisfied with the adequacy of services provided by KEPHIS, but very opposed to the high cost of KEPHIS certification labels in addition to other regulatory costs. However, an important gap exists in the inspection of agro-dealers by regulators. None of the regulators (KEPHIS, Horticulture Crops Development Authority (HCDA), Pet Control Products Board (PCPB), and Weights and Measures Department) inspected agro-dealers regularly. Limited inspection at retail level may result in stocking of expired seed, fake seed and illegal repackaging.

Efforts to stamp out fake seed

Government efforts to stamp out fake seed are rated by the industry as poor with a score of only 38.5%. In this study, fake seed is generally described as seed that has not been certified by the responsible regulatory institution(s) but is available in the market. According to various stakeholders, the main source of fake seed in Kenya is forged packaging of popular seed brands by unscrupulous traders. This mainly happens during periods of seed shortages when desperate farmers are likely to scramble for available seed without much scrutiny of the quality. Of the sampled agro-dealers, 23% had been directly affected by the fake seed problem. Maize is the crop most affected by the fake seed problem. It has been difficult for KEPHIS and other stakeholders to deal with the incidences of fake seed because detection of source is

difficult. KEPHIS indicated receiving an average of 12 reports of fake seed per year.

INSTITUTIONAL SUPPORT

Availability of extension services

In Kenya, the ratio of public sector frontline extension workers to farmers is about 1:1000, compared to the desired level of 1:400. The drop in numbers and quality of public extension services has in recent years attracted entry of other extension service providers (ESPs). These other ESPs include NGOs, CBOs, FBOs and private companies that either sell their agricultural inputs or provide free extension services. However, supplementation by the private sector is limited and not able to reach all farmers in need. Private sector extension services favor commercial farmers and high-value crops while neglecting smallholder farmers and low-value crops such as maize and sorghum. Interviews with seed companies showed that they employ very few extension personnel.

Quality of national seed trade association

The services offered by the Seed Trade Association of Kenya (STAK) are, on average, rated as "fair" by its members with a score of 53.4%. Average scores in specific attributes were as follows: effectiveness in advocacy scored at 50.7%, managerial ability scored at 62.6%, democracy scored at 64.3% and capacity to mobilize resources scored at 54%. In all aspects, members are not very happy with STAK and there is certainly lots of room for improvement. Although STAK members account for only half of the registered seed merchants in the country, they sell over 90% of the certified seed. In addition, there is the continent-wide Africa Seed Trade Association (AFSTA) that also offers services to promote seed trade in Africa.

CONCLUSION

It has been nearly two decades since Kenya's seed sector has been liberalized. For a country with excellent private sector reputation in so many sectors (air travel, tourism, information and communication technologies, banking, flower production, horticulture for export, retailing, etc), privatization of the crop seed sector seems to be lagging behind. Compared to three other African countries, Kenya scored the highest in availability of seed in small packages. The country also performs relatively well on the quality of the seed policy and regulations, maize varieties released, and adequacy of seed inspectors. Overall, the government has set up good legislation but implementation lags behind. A key weakness in Kenya's seed sector is the strong dominance of government parastatals that stifles competition. While there are some challenges with Kenya's seed sector, given the country's strong performance in so many other private sector-led industries, there is great room for optimism. A level playing field, smart and efficient regulations, greater enforcement against fake seed and more, can improve the enabling environment for the seed industry that will ensure timely availability of high quality seeds of improved, appropriate varieties at affordable prices to smallholder farmers in Kenya.



REFERENCES:

- Alliance for a Green Revolution in Africa (AGRA). (September 2010). Kenya Mid-Term Review of the Program for Africa's Seed Systems. AGRA-PASS MTR.
- 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.
- Resource Management and Policy Analysis Institute (REMPAI). (2014). Market Inquiry/Benchmarking of the Seed Industry in Kenya.
- Republic of Kenya (RoK). (2013). Economic Survey, 2013. Kenya National Bureau of Statistics.

For more information, contact:

info@tasai.org

www.tasai.org

Follow us on Twitter: @TASAIindex
Like us on Facebook: The African Seed Access Index

