



TASAI
THE AFRICAN SEED ACCESS INDEX



Ghana Brief 2017 - The African Seed Access Index

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INTRODUCTION

A competitive seed sector is key to ensuring the timely availability of high-quality seeds of improved, appropriate varieties at affordable prices for smallholder farmers. TASA 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.

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 Ghana's seed sector. The study evaluates the enabling environment necessary to build a vibrant formal seed sector, focusing on four grain and legume crops — maize, rice, soya bean, and cowpea. Three of these (maize, rice, and cowpea) are important to food security in Ghana, while soya bean is included as it is an important cash crop with implications for the country's economic development. Maize, rice, and cowpea also represent three of the five priority food crops identified by the country's Food and Agriculture Sector Development Policy (FASDEP II) (Ministry of Food and Agriculture, 2007).

The cultivation of these crops covers about 32% of the country's arable land (FAOSTAT, 2017). The TASAI 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 Ghana with 12 other African countries where TASAI has conducted similar studies.

Overview

Like most other African countries, the seed industry in Ghana 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 in which farmers produce, obtain, maintain, and distribute seed resources from one growing season to the next (FAO, 1998). Due to limited exposure, low availability of most varieties, inability to purchase seeds, limited access to agro-dealers, or for other reasons, most smallholder farmers in Ghana still rely on the informal seed sector. 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 local social structures. The locally grounded nature of these transactions means that there is scant performance data available on the informal sector.

The formal sector focuses on breeding and evaluating improved varieties, as well as producing and selling seed of these varieties certified by the Plant Protection and Regulatory Services Directorate (PPRS), the government department under the Ministry of Food and Agriculture (MOFA) that is responsible for regulating seed in Ghana. According to the Ghana National Seed Plan, certified seed accounts for a mere 11% of the national seed requirement for maize, and 14% of the national seed requirement for rice (Ministry of Food and Agriculture, 2015). As shown in Table 1, Ghana's formal seed sector comprises numerous institutions, including government institutions (e.g. GSID, GLDB, CRI, SARI, and district extension agents), the private sector (mostly local seed companies and agro-dealers), and development agencies. Established in November 2015, the National Seed Trade Association of Ghana (NASTAG) is a new association that brings together all seed companies and other key players in the industry.

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

ROLE	KEY PLAYERS
Research and breeding	CRI, SARI, West Africa Centre for Crop Improvement, universities, IITA
Variety release and regulation	National Variety Release and Registration Committee
Seed production and processing	Seed companies, GLDB, LCIC (foundation seed only)
Education, training, and extension	Seed companies, NASTAG, GSID, PPRS, CRI, SARI, Department of Agricultural Extension Services
Distribution and sales	Seed companies, agro-dealers

Key acronyms: APSP – Agriculture Policy Support Project; CRI – Crop Research Institute; ECOWAS – Economic Community of West African States; GLDB – Grains and Legumes Development Board; GSID – Ghana Seed Inspection Division; IITA – International Institute of Tropical Agriculture; MOFA – Ministry of Food and Agriculture; NASTAG – National Seed Trade Association of Ghana; OPV – Open Pollinated Variety; PPRS – Plant Protection and Regulatory Services Directorate; SARI – Savanna Agricultural Research Institute.



RESEARCH AND DEVELOPMENT

Number of active breeders

For the four priority crops discussed in this study – maize, rice, soya bean, and cowpea – there are 26 active breeders. Of these, 15 breeders are based at Ghana’s two public agricultural research institutions – the Savanna Agricultural Research Institute (SARI) and the Crop Research Institute (CRI). SARI has a mandate for the research and development of the four crops in northern Ghana, while the CRI holds the mandate for the research and development of these crops in southern Ghana. Nine of the breeders work for two private companies. One of these private companies produces only foundation seed, while the other releases its own varieties in collaboration with the CRI. The remaining two breeders work with the West Africa Centre for Crop Improvement, a partnership between the University of Ghana and Cornell University (USA). The number of breeders for each crop is as follows: ten breeders for maize, six for rice, five for soya bean, and five for cowpea.

On average, seed companies rate their satisfaction with the number of active breeders as “good” (73%).¹ The companies are most satisfied with maize (83%) and cowpea (80%), and less satisfied with rice (70%) and soya bean (60%). The number of breeders is fairly even across the four crops. However, the relatively low levels of satisfaction with the numbers of available soya bean breeders signals the need to increase the number of breeders for this crop.

Varieties released in the last three years

Between 2013 and 2015, eight new varieties were released for the four crops. Of these, six were new varieties of maize and two were rice. While no cowpea and soya bean varieties were released during this period, three soya bean and three cowpea varieties were released in 2012. Figure 1 shows the three-year moving average of variety releases since 2003. Given the number of active breeders, the number of

varieties released for the crops is relatively low. According to multiple sources, the main reason for the small number of varieties released is a lack of financial resources. Public breeding programs are underfunded by the government, and largely dependent on external (donor) funding.

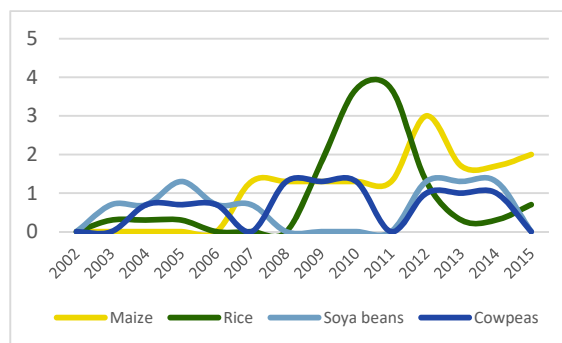


Figure 1: Number of varieties released in Ghana (three-year moving average)

Availability of foundation seed

On average, seed companies rate their satisfaction with the availability of foundation seed as “good” (67%). They are most satisfied with maize (70%), and least satisfied with rice (62%). For both cowpea and soya bean, satisfaction ratings for the availability of foundation seed are 68%.

The main sources of foundation seed for the four crops are the government parastatals, the Grains and Legumes Development Board (GLDB), and the agricultural research institutions CRI and SARI. The GLDB provides maize foundation seed to about one-third (32%) of seed companies in Ghana. SARI is the source of rice foundation seed for 40% of the seed companies. One private research company, the Legacy Crop Improvement Centre (LCIC), produces foundation seed for maize, cowpea and rice. These findings are consistent with a recent study on early-generation seed in Ghana (AGRA, 2016), which found a significant shortage in the supply of foundation seed and other early-generation seed. This shortage is caused by a lack of financial resources in government

¹ All scores are based on industry self-reporting of satisfaction on the following scale: 0%-20% (extremely poor), 21%-40% (poor), 41%-60% (fair), 61%-80% (good), and 81-100% (excellent).



research institutions (mainly CRI and SARI) and a lack of private sector breeding programs.

Average age of varieties sold

The average ages of the varieties currently on the market are as follows: 12.5 years (maize), 5 years (rice), 8.5 years (soya bean), and 14 years (cowpea). The maize OPV variety *Obatanpa* (released in 1992) is the oldest variety on the market. As of 2014, it accounted for 77% of certified maize seed production (AGRA, 2016), because farmers like its attributes and because the new maize varieties released in 2015 are not being promoted as much as *Obatanpa*. By contrast, the rice varieties on the market are relatively young. This may be due to the current demand for rice varieties with aromatic cooking qualities, which has encouraged breeders to release new varieties to replace the old ones. The main reason for the relatively young age of soya bean varieties (8.5 years on average) is that commercial cultivation of the crop in Ghana began less than 20 years ago.

Table 1: Average age of varieties sold in 2016 (in years)

Crop	Average age of varieties sold	Age of oldest variety sold
Maize	12.5	24
Rice	5	7
Soya bean	8.5	13
Cowpea	14	24

Varieties with climate-smart features

To be classified as climate-smart, a crop variety must meet at least one of two criteria – early maturity and/or tolerance to extreme weather conditions such as drought, flooding, or frost. Six varieties of maize were released in 2015, of which four have climate-smart characteristics. The maize varieties *Warikamana*, *Kunjor-wari*, *Suhudoo*, and *Kpari-faako*, developed by the International Institute of Tropical Agriculture (IITA), are early-maturing and tolerant to drought. For rice, soya bean, and cowpea, no varieties with climate-smart features were released in the past three years.

² The data was collected in December 2016, and some companies had not yet consolidated their annual sales figures. In such cases, the

INDUSTRY COMPETITIVENESS

Number of active seed companies

In 2016, there were 17 seed companies engaged in the production and/or marketing of at least one of the four focus crops. All of these companies produced maize seed. In addition, seven of these companies produced rice, five produced soya bean, and nine produced cowpea. The seed industry was privatized in 1989, though most seed companies are less than 10 years old. It is worth noting that several young companies have been set up with support from donor-funded projects.

According to the study conducted by TASAI, the estimated aggregate sales for the four crops in 2016² amounted to 1,832 metric tons. Maize seed accounted for about 78% (1,432 tons) of 2016 sales of the four crops. This is substantially lower than the 2015 maize seed sales of 2,186 metric tons. The TASAI findings on the volume of maize seed sales are consistent with the findings from the AGRA study on early-generation seed, which reported that 2,105 tons of maize seed was produced in 2015 (AGRA, 2016).

Market share of top seed companies

Market share is calculated using seed sales reported by seed companies. By crop, the market shares for the top four companies are: 72% (maize), 77% (rice), 98% (soya bean), and 87% (cowpea). This data shows that a few companies dominate the market for rice,

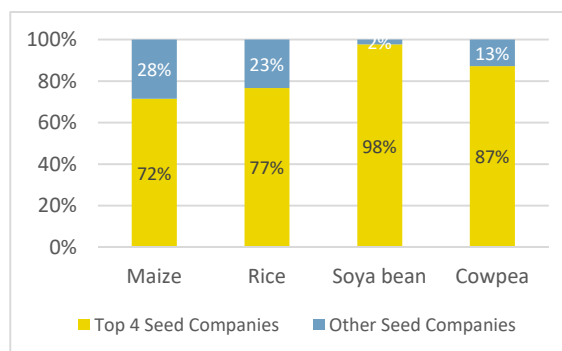


Figure 2: Total market share (%) of top four companies

researchers assumed the 2016 sales to be the same as 2015 sales, which were reported.



soya bean, and cowpea (fig. 2). The maize seed market is more competitive.

The Herfindahl-Hirschman Index (HHI) was also used to quantify industry competitiveness. The index, a sum of squared market shares, ranges from near zero for perfect competition to 10,000 for a pure monopoly³. The HHI was calculated for all seed companies for each crop. The market concentration is low for maize (1,620), average for rice (2,287) and cowpea (2,798), but high for soya bean (3,072). The market shares of the top four companies and the HHI results both indicate that the seed markets for three crops – rice, soya bean, and cowpea – are dominated by a few players, with levels of concentration ranging from average to high.

Market share of government parastatals

Since September 1989, no government parastatal has been involved in the production and/or marketing of certified seed for any of the four crops.

Length of the import/export process for seed

The time it takes to import seed is calculated as the number of days from the application for an import permit to the time the seed is cleared at the border. Only one company in Ghana is involved in seed importation for the focus crops discussed in this brief. This company indicated that the importation process takes about 90 days. Imports mainly come from South Africa (for maize and soya bean) and India (rice). The seed company signaled a low level of satisfaction (20%) with the import process, primarily due to unclear legal and regulatory requirements for importation (that is, what can or cannot be imported), the quantities allowed for import, and the processing time for import permits. In 2016, there were no exports of certified seed from Ghana for any of the four crops.

SEED POLICY AND REGULATIONS

Length of the variety release process

The length of the variety release process is the period of time from the submission of an application for a variety release to the moment of its release by the relevant authority. In Ghana, crop variety release falls under the mandate of the National Variety Release and Registration Committee.

Only two seed companies reported releasing new varieties in Ghana between 2013 and 2015. The average release time across crops was 42 months. By crop, release time varied from 36 months for rice, soya bean, and cowpea to 60 months for maize. The main reasons for this lengthy release process were delays during on-site trials, delayed committee meetings, and delays in setting a date for presenting the findings to the committee. According to the Seed Regulations, the release process should take between 12 and 24 months. On average, the two seed companies that did release new varieties between 2013 and 2015 rate their satisfaction with the release time as “fair” (43%), though this varies significantly across crops. They rate their satisfaction as “fair” for maize and rice (55%), but as “poor” for soya bean and cowpea (30%). It is important to note that the two seed companies expressed different opinions in their satisfaction with the release time for maize. One of the seed companies, whose release process took 84 months, was very dissatisfied with the process (30%). The other seed company, whose release time for maize was only 36 months, was satisfied with the process (80%). This wide disparity shows that there are substantial inconsistencies in the variety release process.

Status of seed policy framework

In 1991, a MOFA Task Force reviewed the Seeds (Certification and Standards) Regulations Decree of 1972 and made recommendations on the rules and regulations pertaining to the operations of the seed industry in view of its new, privatized structure. As a result, the Plants and Fertilizer Act, 2010 (ACT 803) was passed by parliament and accepted by the President

³ Scale for HHI scores: <1,000 (extremely low) (meaning low level of market concentration), 1,000-1,999 (low), 2,000-2,999 (average),

3,000-3,999 (high), >4,000 (Extremely high) (meaning high level of market concentration i.e., monopoly or near monopoly).



on September 6th, 2010. The Act, which is divided into three technical parts, covers Plant Protection (Part One), Seeds (Part Two), and Fertilizer Control (Part Three).

Ghana's Seed (Certification and Standards) Regulations have been aligned with the seed regulations of the Economic Community of West African States (ECOWAS). However, the ECOWAS seed regulations have a broader scope and cover quality control, certification, and marketing, whereas Ghana's regulations cover certification and standards only. It was therefore necessary to re-draft the national seed regulations to incorporate the provisions of the ECOWAS seed regulations. The final document, aligned to the ECOWAS seed regulations, was forwarded to Parliament in December 2015 for ratification. At the time of the writing of this report, it had yet to be considered by Parliament for enactment.

Quality of seed regulations and enforcement

Part Two (Seeds) of the Plants and Fertilizer Act, 2010 (Act 803) constitutes the seed law of Ghana. Seed companies are satisfied with the quality of the seed laws and regulations, rating them as "good" (78%). However, they are less satisfied with the enforcement of these regulations (56%). Though the regulations have been aligned with the ECOWAS protocol, they have not yet been passed by Parliament. When passed, the regulations would outline the procedures for the movement of all classes of seed within the ECOWAS region. In addition, the regulations would also provide the guidelines for private sector engagement in the production and marketing of foundation seed.

Adequacy of seed inspectors

The Ghana Seed Inspection Division (GSID) has a total of 32 seed inspectors distributed across 9 of the 10 regions in Ghana where seed production is carried out. On average, seed companies rate their satisfaction with seed inspection services as "fair" (49%). The main shortcoming of inspection services is that inspectors have inadequate resources to perform their tasks. To alleviate this challenge, the GSID has received support from the United States Agency for International Development (USAID) under the

Agriculture Policy Support Project (APSP) to train 20 GSID seed inspectors on inspection procedures. In addition, the APSP has assisted the GSID with a review of its certification and accreditation manual, which is awaiting approval by the National Seed Council. The intention is to develop a certification and accreditation system that will allow private seed companies to conduct their own seed inspections.

Efforts to stamp out fake seed

Seed companies reported seven cases of the sale of fake seed in 2016. This figure is likely to be an underestimate, as most cases of fake seed are not officially reported. On average, seed companies are not satisfied with the government's efforts to stamp out fake seed, rating these as "poor" (32%). According to the seed companies, the main sources of fake seed are agro-dealers and other seed companies. Some seed companies noted that inadequate knowledge of the 2010 Plants and Fertilizer Act (ACT 803) and its regulations on the part of certain law enforcement agencies, such as the police and customs officials, hampers the successful prosecution of offenders.

INSTITUTIONAL SUPPORT

Availability of extension services

There are an estimated 2,511 agricultural extension workers in Ghana. Most extension workers (2,484) are employed by the government under the Directorate of Agricultural Extension Services. Only 27 extension workers work in the private sector, where they are employed mainly by seed companies. According to Ghana's National Seed Plan (MOFA, 2015), the ratio of extension workers to farmers is 1:1500. This is considerably lower than in other African countries, for example, Ethiopia (1:592) and Kenya (1:910). There is a clear need to invest more in the quantity and quality of extension services in Ghana, as this would promote the adoption of improved seed and good farming methods. Increased investment in extension services would likely also result in more favorable ratings from seed companies, who currently rate their satisfaction with the extension services as "fair" (52%).



Quality of the national seed trade association

The National Seed Trade Association of Ghana (NASTAG) is the umbrella association for all seed trade stakeholders in Ghana. It was formed in November 2015 and is currently run by interim executive officers. NASTAG is made up of the Seed Producers Association of Ghana, the Seed Traders Association of Ghana, the Ghana Agro-input Dealers Association, the CRI, and Croplife, Ghana.

Seed companies rate their satisfaction with the overall quality of NASTAG as “fair” (46%). This low score is mainly due to the fact that NASTAG is still a young organization without a fully functioning secretariat and board of directors. Figure 3 illustrates the seed companies’ level of satisfaction with NASTAG’s performance across six service areas. NASTAG received its highest rating for democracy and governance (64%), while it is rated lowest on its ability to mobilize resources (36%). NASTAG’s members rate the association’s ability to provide value to members as “poor” (38%). The other service areas – managerial ability, effectiveness in advocacy and activity, and activity on important seed sector issues are rated as “fair” (between 43% and 46%).

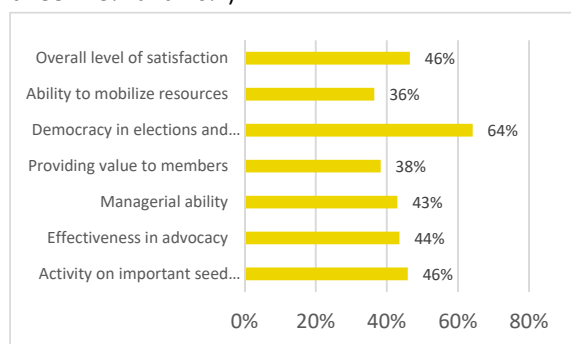


Figure 3: Members' satisfaction with NASTAG (Source: TASAI Survey)

SERVICE TO SMALLHOLDER FARMERS

Concentration of rural agro-dealer network

According to the updated Directory of Ghana Agro-Input Dealers (AGRA, 2012), there are 3,153 agro-input dealers across Ghana. This translates to a ratio of one agro-dealer for approximately every 794 agricultural households. These agro-dealers stock seeds and other agricultural inputs such as fertilizers and chemicals. There are notable efforts to improve the

capacity of agro-dealers in Ghana. One of these efforts, supported under the APSP, builds the capacity of agro-dealers to address the issue of counterfeit seeds. Seed companies rated their satisfaction with the agro-dealer network as “good” (64%).

Availability of seed in small packages

For the four crops addressed in this study, 66% of all seed was sold in packages of 2 kg or less. This is a high proportion, but there is significant variation across the four crops, as shown in Figure 4. The amount of seed sold in small packages ranges from 74% for maize to 14% for soya bean, with cowpea (42%) and rice (29%) in the middle. Most soya bean seed (79%) is sold in packages of at least 25 kg. The large package size could be an impediment to variety adoption by smallholder farmers, who are more likely to experiment with new varieties only if they can purchase these in small volumes.

The seed companies’ satisfaction with the availability of seed in small packages is positively correlated with the volumes of seed sold in small packages. On average, seed companies rate their satisfaction with the volumes of seed sold in small packages as “good” (72%). The companies are more satisfied with volumes seed sold in small packages for maize (81%) and rice (74%), than for soya bean (65%) and cowpea (50%). Usually, the PPRSD provides one certification tag per 50 kg bag. Consequently, much of the seed sold in small packages is seed that has been re-bagged and does not have a certification tag. This makes it more difficult to effectively identify potentially fake seed, as even certified seed cannot always be expected to be sold with a certification tag.

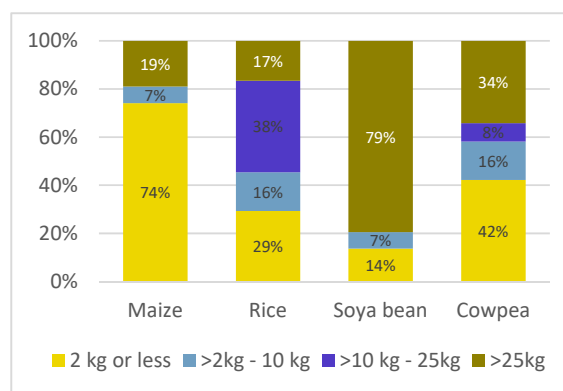


Figure 4: Percentage of seed sold in different package sizes



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 grain recycled by the farmer. Hybrid maize has the highest seed-to-grain price ratio (6.1:1). The seed-to-grain price ratios are 4.3:1 for maize OPV, 4.4:1 for soya bean, 1.66:1 for rice, and 2.03:1 for cowpea. These price ratios are comparable to other African countries.

OPPORTUNITIES AND CHALLENGES

Despite its relatively young age, there are already clear reasons to be optimistic about the future of Ghana's seed industry. The key policy instruments, namely, the National Seed Policy and the Plants and Fertilizer Act, are less than eight years old, and the amended regulations are soon to be passed by the Parliament. In addition, the newly formed NASTAG has secured the support of most industry players, and therefore provides a good platform to ensure that seed companies are well represented in relevant policy discussions.

These positive aspects notwithstanding, Ghana's formal seed sector faces some formidable challenges. Only eight varieties (for all four crops) were released during the past three years. This shows a low level of investment in varietal development by both the public and private sectors. Despite being part of the ECOWAS regional seed harmonization arrangements, the level of seed trade between Ghana and other countries in the region is low. For the four crops, only one seed company imports seed into Ghana. The low level of regional trade partly contributes to the low volumes of certified seed sold in the country (less than 2,000 metric tons in 2016). Despite the amended seed legislation and regulations, seed companies continue to face operational challenges. Most notable is the lengthy variety release process (60 months for maize), which discourages investment in breeding.

CONCLUSION

The seed industry in Ghana is in the early-growth stage and there is significant room for greater participation by the private sector. While there are many companies producing and/or marketing maize and rice seed, the

overall volumes are still very low. There are opportunities for regional trade under the ECOWAS seed harmonization arrangements. To increase adoption rates among farmers in Ghana, seed companies should promote some of the new seed varieties – especially the varieties of maize and rice which are higher-yielding and have more climate-smart characteristics. In addition, companies may have to reduce package sizes for soya bean and cowpea to make the seed more attractive and economically viable for small farmers.

To address the challenges in the seed sector, strategic interventions are needed at various critical stages including, among others: investment in research and breeding; improving seed companies' access to foundation seed; improving the performance of the National Variety Release and Registration Committee to reduce the length of time it takes to register a variety; and addressing the problem of fake seed.

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APPENDIX

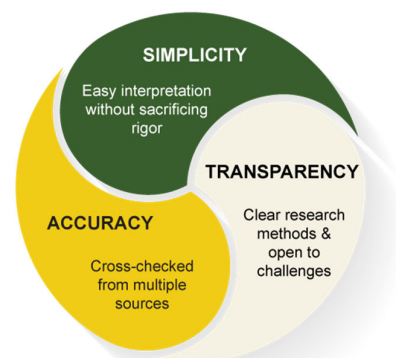
For a comparison of TASAI Indicators across 13 countries, please visit: <http://tasai.org/wp-content/uploads/TASAI-Appendix-CURRENT.pdf>



ABOUT THE AFRICAN SEED ACCESS INDEX

The **African Seed Access Index (TASAI)** is a seed industry research initiative housed at **Market Matters Inc.** (MM Inc.). **TASAI's goal** is to encourage African governments and other seed industry players to create and maintain enabling environments that will accelerate the development of a vibrant private sector-led seed system serving smallholder farmers. It is this enabling environment that TASAI seeks to measure, track, and compare across Africa countries.

To assess the status of the seed industry value chain, TASAI employs **20 indicators** grouped into five categories: **Research and Development, Industry Competitiveness, Policy and Regulations, Institutional Support, and Service to Smallholder Farmers.**



TASAI PRINCIPLES



PILLARS OF COMPETITIVE SEED SECTORS

In 2019 TASAI studies will have been completed in **21 African countries**: Burkina Faso, Burundi, Cote d'Ivoire, the Democratic Republic of Congo, Ethiopia, Ghana, Kenya, Liberia, Madagascar, Malawi, Mali, Mozambique, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Tanzania, Uganda, Zambia, and Zimbabwe. In each country TASAI **works closely with local seed industry actors**, governments, and international development agencies to share the TASAI findings and to identify the next steps for creating a vibrant national seed sector.

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