



TASAI

THE AFRICAN SEED ACCESS INDEX



Rwanda Brief 2018 - The African Seed Access Index

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August 2019

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INTRODUCTION

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

This country brief summarizes the key findings of The African Seed Access Index (TASAI) study appraising the structure and economic performance of Rwanda's seed sector in 2017. TASAI's standard approach is to focus on four grain and legume crops important to food security in each target country, in order to evaluate the enabling environment needed to create a vibrant formal seed sector. In the case of Rwanda, the four crops — maize, bean, wheat, and soya bean — also form part of the Rwandan government's Crop Intensification Program. In season A in 2018, these four crops accounted for 57% of the cultivated agricultural area in Rwanda (National Institute of Statistics of Rwanda, 2018). At the request of industry stakeholders in Rwanda, however, the study was expanded to include two vegetatively propagated crops — cassava and sweet potato — with a focus on their nutrition-enhanced characteristics. It is important to note that, while included in the study, not all TASAI indicators are applicable to these crops, which are vegetatively rather than seed-propagated. As such, the findings discussed in this brief in general apply to the four main focus crops; when the findings concern the vegetatively-propagated crops, this will be indicated.

The study covers 20 indicators, divided into the five categories: Research and Development, Industry Competitiveness, Seed Policy and Regulations, Institutional Support, and Service to Smallholder Farmers. [Appendix 1](#) summarizes the indicators and compares Rwanda to 20 other countries where the TASAI study has been conducted.

Overview

Like in most other African countries, the seed industry in Rwanda 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, develop and distribute seed resources from one growing season to the next. Due to limited exposure, low availability of varieties, inability to purchase seed, limited access to agro-dealers, or for other reasons, most smallholder farmers in Rwanda still rely in part on informal seed systems, particularly for crops other than maize. In the informal system, farmers generally acquire seed from the local community, for example through markets and the farmers' social networks. Standards in the informal seed sector are not monitored or controlled by government policies and regulations; rather, the sector is guided by indigenous knowledge and standards, and by local social structures.

The formal sector focuses on breeding and evaluating improved varieties and providing these varieties to registered seed producers for multiplication and eventual sale to farmers. The National Institute of Statistics of Rwanda estimates that, depending on the season, only between 6% and 13% of smallholder farmers utilize improved seed (National Institute of Statistics of Rwanda, 2018). Cassava and sweet potato yields are very low. The NISR reports cassava yield to be about 13.5 tons per hectare compared to optimal yields of up to 80 tons (Food and Agriculture Organization of the United Nations, 2013). Pending the operationalization of the Rwanda Inspection and Competitiveness Agency (RICA), the Rwanda Agriculture Board (RAB) oversees the registration of seed producers and seed dealers. The formal sector is governed by Law N° 005/2016 of 05/04/2016, regulating seed and plant varieties in Rwanda (Government of Rwanda, 2016), and subsidiary legislation in the form of Ministerial Orders. Table 1 below lists the public and private sector institutions that comprise Rwanda's formal seed sector (Table 1).

Table 1: Key players and their roles in the seed industry in Rwanda

ROLE	KEY PLAYERS
Research and breeding	RAB, foreign-owned seed companies
Variety release and regulation, inspection and certification	RAB, MINAGRI, RALIS, RICA
Seed production	Seed producers (companies, seed cooperatives and individual seed producers)
Processing and packaging	Seed companies
Education, training, extension	RAB (extension officers), FFS facilitators, farmer promoters, NGOs
Distribution and sales	Government agencies (RAB, MINAGRI), seed producers, rural agro-dealers, NGOs

Key Acronyms: CIP – Crop Intensification Program; CGIAR – Consultative Group on International Agricultural Research; COMESA – Common Market for Eastern and Southern Africa; DUS – Distinctness, Uniformity, and Stability; EAC – East African Community; FFS – Farmer Field Schools; MINAGRI – Ministry of Agriculture and Animal Resources; NISR – National Institute of Statistics of Rwanda; NGOs – Non-Governmental Organizations; NSAR – National Seed Association of Rwanda; OFSP – Orange-Fleshed Sweet Potato; OPVs – Open Pollinated Varieties; PVRC – Plant Variety Evaluation, Certification and Release Committee; RAB – Rwanda Agriculture Board, RALIS – Rwanda Agricultural Livestock Inspectorate Services; RICA – Rwanda Inspectorate and Competitiveness Agency; RWASEMO – Rwanda Seed Multipliers Organization; VCU – Value for Cultivation and Use



RESEARCH AND DEVELOPMENT

Number of active breeders

For the six priority crops – maize, bean, soya bean, wheat, cassava, and sweet potato – Rwanda has 16 active breeders. Of these, four breeders produce maize, three each produce bean and sweet potato, and two each produce soya bean, wheat, and cassava. All 16 active breeders are employed in the public sector by the Rwanda Agriculture Board (RAB). In addition, several foreign-owned companies rely on their regional headquarters outside Rwanda for breeding services.

On average, seed producers¹ rate their satisfaction with the number of active breeders as “good” (73%).² The highest levels of satisfaction were reported for wheat and sweet potato (both 86%), while breeders for the other crops were all rated “good”: maize breeders (67%), bean breeders (60%), and cassava breeders (73%). Producers reported that they had a good working relationship with public breeders, noting that the RAB usually responds to their requests on time.

Varieties released in the last three years

Between 2015 and 2017, a total of 10 varieties were released across the six crops: 6 maize and 4 wheat varieties. No varieties of bean, soya bean, cassava, or sweet potato were released during this period. Figure 1 shows the trend in the number of varieties released between 2001 and 2017.

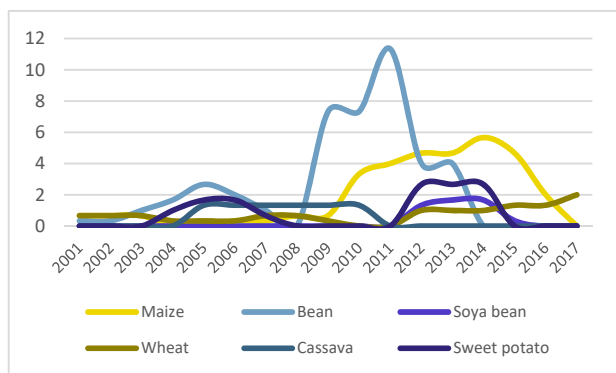


Figure 1: Trend in varieties released between 2001 and 2017

The main reason for the low number of releases is a change in the variety release system. Prior to 2016,

¹ ‘Seed producer’ as used here is defined as ‘anyone approved to produce seed.’ This includes producers of all types of seed and planting materials. As such, the term ‘seed producer’ will be used throughout for both producers

variety development and release fell under the mandate of the RAB, in partnership with the Ministry of Agriculture and Animal Resources (MINAGRI). The law governing seed and plant varieties was passed in 2016, transferring the mandate for variety release to the Plant Variety, Evaluation, Certification and Registration Committee (PVECRC). Following the passing of the new law, the Committee met twice in 2018 and recommended 81 varieties for release, including 44 maize hybrid varieties, 3 soya bean varieties, and 2 wheat varieties.

There was a sharp increase in bean releases between 2010 and 2012. During this period, the bean research program at the RAB received financial support from Harvest Plus and the Alliance for a Green Revolution in Africa (AGRA).

Availability of foundation seed or planting materials

Almost all seed producers source their foundation seed directly from the RAB. Bean seed, however, is also obtained from Harvest Plus, which is part of the research program on Agriculture for Nutrition and Health of the Consultative Group on International Agricultural Research (CGIAR). A few foreign-owned seed companies have also started producing seed locally; they source foundation seed from their regional breeding programs located outside Rwanda.

Seed producers are very satisfied with the availability of foundation seed provided by the RAB, rating their satisfaction as “good” for maize (77%) and wheat (77%) and “excellent” for soya bean (87%). Seed producers’ main complaint is the cumbersome payment arrangement for the foundation seed: to obtain foundation seed for maize, wheat, and soya bean, producers must first make a payment at either the National Bank of Rwanda or BPR Atlas Mara Bank, and then take the bank slip to the RAB headquarters in Kigali. This process not only takes time, but also requires them to travel far from their farms.

Bean seed producers do not face the same problem, as they can obtain bean seed from Harvest Plus on credit. For their part, bean seed producers complain about occasional shortages of foundation seed and the limited number of bean varieties, especially bio-fortified varieties. Despite these challenges, bean producers rate the

of seed-propagated crops and producers of planting materials for the vegetatively-propagated cassava and sweet potato crops.

² All scores are based on industry self-reporting of satisfaction on the following scale: 0-19.99% (extremely poor), 20-39.99% (poor), 40-59.99% (fair), 60-79.99% (good), and 80-100% (excellent).

availability of foundation seed as “good” (75%). However, while they are satisfied with its availability, seed producers are not satisfied with the quality of the foundation seed. In many instances, the seed producers complain that the seed does not perform as expected.

Producers of cassava and sweet potato obtain improved planting materials from the RAB. However, the process of obtaining planting materials from the RAB differs from the arrangement for seed-propagated crops. Producers of cassava and sweet potato first receive planting materials for free. After the first harvest, the RAB purchases most of the cassava cuttings and sweet potato vines and distributes these to other producers. After the second harvest, the first group of beneficiaries supplies a part of their cuttings and vines to neighboring farmers at no charge. Due to the direct and frequent contact between the breeders and producers, producers are very satisfied with the availability of planting materials: 83% for sweet potato, 80% for nutrition-enhanced cassava and 87% for cassava. For these crops, the seed producers’ main complaint is the lack of a sustainable market.

MINAGRI is setting up a system in which the producers of basic seed (mainly the RAB) will be coordinated with seed producers. This will serve to provide the government with an accurate estimate of the demand for all categories of Early Generation Seed (EGS).

Number of varieties sold in 2017

In 2017, seed producers sold a combined total of 34 varieties of the six crops to farmers. The breakdown by crop was as follows: maize (18), bean (3), soya bean (3), wheat (4), cassava (2), and sweet potato (4). The number of

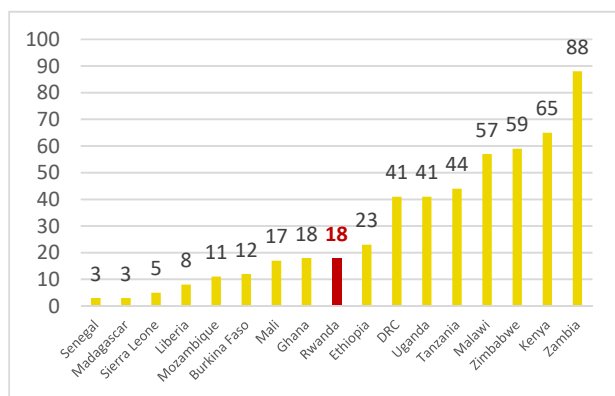


Figure 2: Number of maize varieties sold

³ This only pertains to varieties dropped by seed producers, and not necessarily varieties dropped by the RAB.

maize varieties sold compares favorably with other African countries such as Mali (17 varieties sold), Ghana (18 varieties sold) and Ethiopia (23 varieties sold). However, the number is still significantly lower than in other countries in the region like Tanzania (44 varieties sold) and Kenya (65 varieties sold) (figure 2).

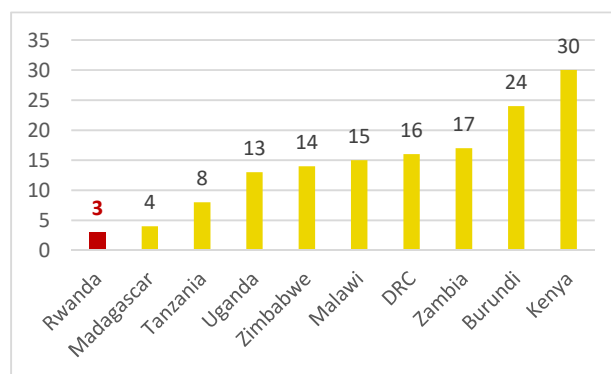


Figure 3: Number of bean varieties sold

The same applies to bean varieties. The number of bean varieties sold in Rwanda (3) is lower than the number sold in most other countries over a three-year period, such as Zambia (17 varieties sold), Uganda (13 varieties sold) and Zimbabwe (14 varieties sold) (figure 3).

Bean varieties on the market are sourced from the RAB, from one of five foreign-owned companies in Rwanda, or from Harvest Plus.

Of the two cassava varieties, one was developed by the RAB and the other was imported from Uganda. The government imported this variety to respond to an outbreak of cassava brown streak virus (CBSV), which was reported in all districts. The four sweet potato varieties were sold through the International Potato Centre (CIP). Most of these varieties were orange-fleshed sweet potato (OFSP) varieties, which were developed and released by the RAB in 2013.

Number of varieties dropped over the last 10 years

The TASAI survey asked seed producers to indicate if they had stopped producing any varieties between 2008 and 2017.³ Across the six crops, seed producers reported dropping a total of 17 varieties: 3 maize, 6 bean, 1 soya bean, 3 wheat, 2 cassava and 2 sweet potato varieties.



Table 2 lists the varieties dropped between 2008 and 2017, followed by the most frequently cited reasons for dropping the variety.

Table 2: Reasons for dropping varieties

Crop varieties	Reason dropped
Maize	
ZM 607	Preference for OPV
Pool 9A	Preference for short-maturing varieties
M101	Dislike for small grains
Bean	
RWR10/2245/3006, Kaki, & Decelaya	Lack of markets; though RWR2245 is still popular in the mid-altitude region, quality basic seed is not readily available
Wheat	
Bisagi	Susceptibility to disease (e.g., leaf rust)
Cyihure	Low yield
Cassava	
Mbakungaze, Cyizere, Ndamirabana, & Mbagarubise	High susceptibility to cassava brown streak virus and low yield
Sweet potato	
Ndamirabana	High susceptibility to drought
Gihingumukungu	Customers do not like its large tubers

Average age of varieties sold in 2017

The average age of varieties sold in 2017 ranged from 4 years (cassava) to 13 years (soya bean). The ages of the oldest varieties ranged from 7 years (cassava) to 37 years (wheat).

Table 3 lists the average age and age of the oldest varieties sold in 2017.

Table 3: Age of varieties sold in 2017

Crop	Average age of varieties sold	Age of oldest variety sold
Maize	10	27
Bean	7	7
Soya bean	13	32
Wheat	12	37
Cassava	4	7
Sweet potato	6	11

Varieties with climate-smart features

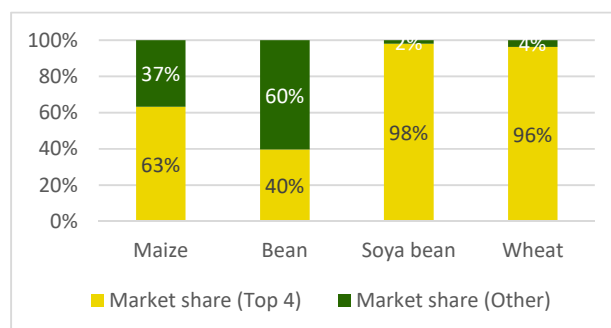


Figure 4: Market share of top four seed producers in Rwanda

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. For maize, two of the six varieties released between 2015 and 2017 were climate-smart, with drought tolerance being the dominant trait. All four wheat varieties released in this time period were early-maturing. No climate-smart varieties of bean and soya bean were released in Rwanda. This is largely because, globally, research and development of climate-smart varieties of these crops is still limited.

INDUSTRY COMPETITIVENESS

Number of active seed producers

According to the RAB, in 2017, there were 665 active seed producers for the six crops. The producers fall into three categories: 588 are individual seed producers, 62 are co-operatives (including 14 associations and 4 groups⁴), and 15 are seed companies (5 of which are foreign-owned). Of the 15 active seed companies, 14 produced maize seed, 6 produced bean seed, 8 produced soya bean seed and only one each produced wheat seed and improved planting material for cassava and sweet potato. The number of active seed companies⁵ producing the four seed-propagated focus crops in Rwanda is slightly lower than the equivalent number in other countries in the region, such as Ethiopia (21), Kenya (22), Malawi (22), and Uganda (22).

In 2017, seed producers in Rwanda sold a total of 2,677 tons of maize seed, 955 tons of bean seed, 765 tons of soya bean seed, and 919 tons of wheat seed. Harvest Plus

⁴ Associations and groups are referred to as pre-cooperatives, as they are yet to fully meet the requirements to register as a cooperative.

⁵ The number of active seed companies here does not include other categories of seed producers, such as seed cooperatives and individual seed producers.



plays a key role in the bean seed market by buying seed from seed producers and providing it to farmers.

Market share of top seed companies

Market concentration is calculated in two ways. First, by calculating the sales of the top four companies as a percentage of total industry output for each commodity. Using this method, the volume-weighted market share for the top four seed companies was 63% for maize, 40% for bean, 98% for soya bean, and 96% for wheat. Figure 4 illustrates these market shares.

Market concentration was also analyzed using the Herfindal-Hershman Index (HHI). The HHI measures market concentration by squaring the market share of each firm competing in a market and then adding up the resulting numbers. The HHI can range from close to zero (perfect competition) to 10,000 (monopoly)⁶. The HHI was calculated for each of the four seed-propagated crops. The HHI is low for maize (1,257), extremely low for bean (952), and average for soya bean (2,639). Due to the low number of active producers of wheat seed, the HHI score for wheat is extremely high (6,566). The market shares of the top four companies and the HHI results both indicate that the seed markets for maize and bean are more competitive because there are many seed producers, none of which dominate the market. However, the soya bean and wheat seed markets are less competitive. For soya bean seed, the top four producers are responsible for 10-32% of overall production. The wheat seed market has few producers and is dominated by one player that controls about 80% of the seed market.

Market share of government parastatal

Rwanda has no active government parastatal engaged in the production and marketing of certified seed.

Length of import process for seed

The length of the import process is calculated as the number of days from the date of application for an import permit to the date when the seed is cleared at the border point of entry. To import seed, a company must apply to RALIS for a Plant Import Permit (PIP) and obtain a phytosanitary certificate and ISTA orange certificate from the source country.

In 2017, only five seed companies imported seed for the four seed crops into Rwanda. Maize seed was imported in the largest quantity (2,659 tons), followed by wheat (550 tons), and soya bean (170 tons). No planting materials for cassava or sweet potato were imported in 2017. The main border points of entry were Katuna (Rwanda/Uganda border) and Rusumo (Rwanda/Tanzania border).

The average length of the import process reported by seed companies was 17 days. Obtaining the relevant documentation, including the import permit and phytosanitary certificate, took an average of 9 days. Clearing the seed at the border point of entry took 8 days, on average. These numbers vary by crop. Importing maize seed takes longer, for example, as importers need to provide documentation showing that the maize has been analyzed for maize lethal necrosis virus. Overall, seed companies rate the import process as “good” (75%). Figure 5 provides a comparison of the length of the seed import process in different African countries surveyed by TASAI.

No seed of any of the four crops was exported in 2017.

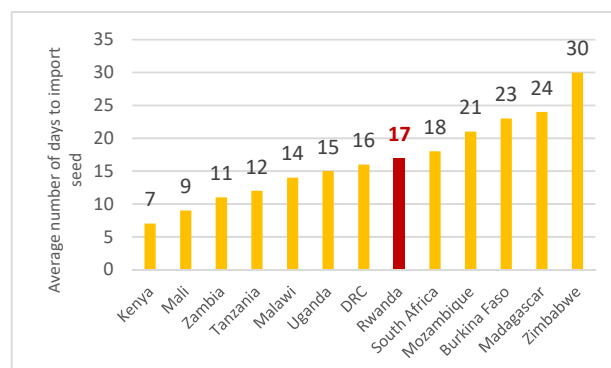


Figure 5: Average number of days to import seed

SEED POLICY AND REGULATIONS

Length of variety release process

The length of the variety release process is calculated as the number of days from the date that an application for variety release is submitted to the Plant Variety Evaluation, Certification and Release Committee (PVECRC) to the date when the variety is approved for release.

According to Law N° 005/2016 of 05/04/2016 governing Seeds and Plant Varieties in Rwanda, a variety must undergo tests for Distinctness, Uniformity, and Stability (DUS) and Value for Cultivation and Use (VCU) over two

⁶ The scale for HHI scores ranges from extremely low to extremely high levels of market concentration: <1,000 (extremely low), 1,000-1,999 (low),

2,000-2,999 (average), 3,000-3,999 (high), >4,000 (Extremely high, i.e., monopoly or near monopoly).



growing seasons in at least three locations. The fee for a DUS test is US \$600 for the two seasons, while VCU tests run US \$500 per season.

The Ministerial Order to implement these parts of the law was signed in 2017. By the end of 2018, 146 applications for variety release had been submitted to the committee by the RAB and nine private companies (MINAGRI 2019). Applications were submitted for seed for hybrid maize, potato, wheat, soya bean, bean, sweet potato, sorghum, rice, sunflower and several fodder crops. By the end of 2018, the PVECRC had met twice and recommended 81 varieties for release. One of the challenges noted by seed companies was that the PVECRC also serves as the National Performance Trials Committee.

The Ministerial Orders have been harmonized to comply with the Common Market for Eastern and Southern Africa (COMESA) Seed Regulations. Article 3 in the Ministerial Order allows for the importation of seed varieties that have a COMESA certificate. In addition, Article 2 states that varieties are exempt from DUS tests if they have already been tested in at least two countries that belong to the same regional bloc as Rwanda.

Status of seed policy framework

Rwanda's national seed policy was adopted by the cabinet in 2017 but is currently under review by the government. The main legislative instrument is the Law N° 005/2016 of 05/04/2016, governing Seeds and Plant Varieties in Rwanda. The law addresses all issues related to seed, plant variety protection, and plant breeders' rights. Subsidiary legislation is contained in various Ministerial Orders published in the government's official gazette and includes: (i) N° 005/11.30 of 11/04/2017, determining the criteria for a seed testing laboratory; (ii) N° 007/11.30 of 11/04/2017, determining the requirements for a person to be granted a license for importing and exporting seed; and (iii) N° 010/11.30 of 11/04/2017, determining procedures for variety release.

Rwanda is a member of both COMESA and the East African Community (EAC). Ministerial Order N° 010/11.30 of 11/04/2017 stipulates that Rwanda has adopted the COMESA procedures for certification of new and existing varieties. Rwanda is one of only seven countries out of the nineteen-member COMESA bloc to have harmonized its seed regulations by the end of 2018.

Quality of seed regulations and enforcement

Seed producers rate the quality of the seed law and regulations in Rwanda as "good" (68%). In contrast, producers are less satisfied with the enforcement of these instruments, rating them as "fair" (60%). Producers highlighted the following areas that require urgent attention: transfer of certification activities from the RAB to the Rwanda Inspectorate and Competitive Authority (RICA); and reducing the number of steps in the authorization, inspection, and certification processes.

The NVRC received its first set of applications for variety release in 2018. Despite being in its formative stages, there are several issues that the Committee needs to address: (i) The NVRC receives applications for variety release directly from breeders and then makes recommendations for release. In other countries, for example in Kenya, the initial applications are submitted to a different committee – National Performance Trials Committee (NPTC) which makes recommendations to the NVRC. The two-committee set-up is intended to avoid a conflict of interest where one committee does not serve as both the receiver and reviewer of applications and jury that delivers the verdict on the applications; (ii) clarifying the information required for an application for a variety release. The main reason, as reported by the NVRC, for not recommending varieties for release, was missing information in the applications. However, some of the applicant seed companies reported that they submitted the information that was asked of them by the PVECRC; (iii) the PVECRC has yet to publish the Plant Variety List (also called the National Variety Catalogue), in accordance with Article 5 of the seed law.

Adequacy of seed inspectors

Rwanda currently has eight public seed inspectors, all employed by the RAB; however, the mandate for seed inspection is being shifted to RICA. Seed producers surveyed are satisfied with seed inspection services, rating these as "good" (70%). Producers are more satisfied with the availability of inspection services at the border points (satisfaction rating of 90%) than at the production or retail levels (satisfaction rating of 64%). However, producers are concerned about the number of seed inspectors in the country, which is considerably lower than in other African countries, such as Ethiopia (32), Kenya (76), Malawi (37), Mozambique (25), Tanzania (48) and Zimbabwe (60).



Not having enough inspectors may limit the government's capacity to check for counterfeit seed at the retail level.

Efforts to stamp out fake seed

Seed producers received 28 reports of fake seed in 2017. According to producers, the main sources of fake seed⁷ are seed retailers (seed stockists) and contract growers. While they are satisfied with the government's efforts to stamp out fake seed, rating these efforts as "good" (72%), the producers surveyed felt that there is nonetheless an urgent need for the government to work closely with seed sector stakeholders to address this issue.

The problem of counterfeit seed in Rwanda does not appear to be as profound as in other countries, where seed companies are more dissatisfied. In some countries, seed companies and producers rate their respective governments' effort to address the challenge as "poor": DRC (22%) and Malawi (38%), or as "fair": Tanzania (57%), Uganda (53%) and Zambia (57%).

Use of smart subsidies

Since 2016, the government of Rwanda has been implementing a subsidy program called the Crop Intensification Program (CIP). In 2016/2017, the program reached about 2.5 million farmers. The subsidy program focuses on three of the six crops – maize, soya bean, and wheat. The program works as follows: the RAB indicates the volume of seed and fertilizer required per crop throughout the country and notifies seed producers of the supply requirements and issues the necessary import permits to registered seed companies. Seed producers mainly supply the seed to the RAB, though a few seed companies sell directly to registered agro-dealers. A government entity by the name of the Agro Processing Trust Corporation (APTC) obtains the seed from the RAB and then coordinates the distribution of seed through the agro-dealer network. Farmers participating in the program are identified through the Smart *Nkunganire* System (SNS), a new ICT platform whose goal is to digitize the supply-chain in Rwanda. Farmers receive vouchers to be redeemed for seed and fertilizer at registered agro-dealer outlets. The RAB and the local governments jointly monitor the outlets to ensure that only quality seed is being sold.

Seed producers reported high levels of satisfaction with the transparency of the seed procurement process (87%)

and the clarity in the procurement requirements and procedures (77%). However, they were less satisfied with the predictability of the process (53%), that is, the advance notice specifying the seed types and quantities to be procured. The seed producers were least satisfied (43%) with the efficiency of the RAB's payment procedure, citing late payments from the RAB as their chief complaint.

INSTITUTIONAL SUPPORT

Availability of extension services

The RAB oversees agricultural extension services in Rwanda. According to the RAB's own records, the country currently has 16,966 agricultural extension workers. Of these, the RAB employs 466 extension officers, of whom 20 are RAB extension staff, 30 are district agronomists, and 416 are agronomists at the sector level. These officers play a key role in disseminating technologies to farmers, facilitating train-the-trainer sessions, and coordinating national agricultural programs.

To complement these officers, the RAB has developed a new extension model called "*Twigire Muhinzi*," which gives farmers a key role in agricultural extension work. The model relies on two extension approaches: the "farmer promoter" approach and the "farmer field school" (FFS) approach. The farmer promoter model provides access to inputs combined with information on agronomic practices through mobilization and demonstration plots. Farmer field schools provide farmers with in-depth knowledge through experimental learning over a crop cycle. By the end of 2015, there were 2,300 FFS facilitators and 14,200 farmer promoters, whose combined efforts reached about 1.3 million farmers, or 62% of agricultural households.

According to the Agricultural Household Survey of 2017, Rwanda has 2.1 million agricultural households (National Institute of Statistics of Rwanda, 2017), which translates to a ratio of one agricultural extension officer for every 124 agricultural households (1:124). This ratio is the highest among the countries covered by TASAI: Kenya (1:910), Malawi (1:1,390), Tanzania (1:830), Uganda (1:5,000) and Zambia (1:560).

The NISR survey revealed that most farmers (89%) received crop extension services in 2018. In addition, 13%

⁷ The issue of fake seed does not apply to the planting materials of vegetatively-propagated crops for several reasons, one of which is the fact that one of the main avenues for the faking of seed is packaging grain into seed

packages. This doesn't apply to cassava and sweet potato planting materials, which are not sold in packages



of the farmers belong to groups formed under the *Twigire Muhinzi* model. Given this extensive effort to provide extension services to farmers, seed producers unsurprisingly rate their satisfaction with the agricultural extension services as “good” (67%). This rating is among the highest in the countries surveyed by TASAI (Table 4).

Table 4: Number of farming households per extension officer

Country	No. of households/ extension officer	Satisfaction w/extension services (out of 100%)
Rwanda	124	67%
Zimbabwe	127	72%
Zambia	560	55%
Tanzania	831	56%
Sierra Leone	923	24%
Kenya	960	48%
Burkina Faso	1000	73%
Mozambique	1,045	56%
South Africa	1,059	46%
Mali	1,350	73%
Malawi	1,388	47%
Ghana	1,500	52%
Burundi	3,298	56%
Uganda	5,000	59%
DRC	5,898	54%

Quality of national seed trade association

Formed in 2015, the National Seed Association of Rwanda (NSAR) is a member-based association for all seed producers in Rwanda. The NSAR currently has 42 members and is actively recruiting new members. The association is gradually building its profile to ensure that it is recognized by the main government institutions, including the RAB and MINAGRI. Currently, the NSAR is a member of two key bodies – the Rwanda Private Sector Federation and the Africa Seed Traders Association (AFSTA).

Though it is still young, the members of the NSAR are fairly satisfied with the association’s performance. Figure 6 illustrates seed producers’ level of satisfaction with the NSAR’s performance, both overall and across six service areas. The NSAR received an overall satisfaction rating of “fair” (48%). Each of the six service areas rated – effectiveness in advocacy, activity on important seed sector issues, managerial ability, providing value to members, democracy and governance, ability to mobilize resources – was also rated as “fair”, with scores ranging from 40-48%.

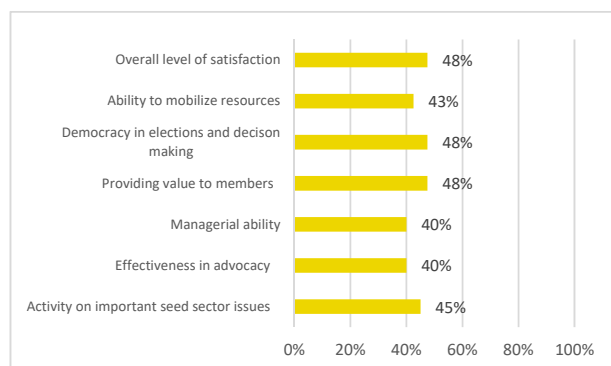


Figure 6: Performance of the National Seed Association of Rwanda (NSAR)

In other African countries, where seed associations are more established, members report greater overall satisfaction: Kenya (62%), Malawi (73%), South Africa (81%), Tanzania (71%), Uganda (65%) and Zambia (69%).

MINAGRI is facilitating the formation of a national seed consortium. The consortium will be a public-private partnership and will include all categories of key actors in the seed sector. The main objectives of the consortium will be to coordinate seed sector activities and identify key challenges in the sector.

SERVICE TO SMALLHOLDER FARMERS

Concentration of rural agro-dealer network

According to the Rwanda Agro-Dealers Development project, in 2017 there were 1,460 trained agro-dealers in Rwanda, translating to one agro-dealer for every 1,440 agricultural households. Seed producers rate their satisfaction with the rural agro-dealer network as “fair” (51%).

Availability of seed in small packages

Of the four seed-propagated crops, only maize seed is sold in small packages; specifically, 54% of maize seed is sold in packages of 2kg or less. Further analysis shows that only imported seed is sold in small packages. All locally produced maize seed is sold in larger package sizes. All bean and soya bean seed is sold in package sizes greater than 25kg. Bean seed is sold in 50kg packages. Both imported and locally produced soya bean seed is sold in 50kg packages. All wheat seed is sold in larger packages: 57% in packages of 10-25kg and 43% in packages of 50kg (figure 7).



Seed producers are fairly satisfied with the availability of seed in small packages for maize (59%) and wheat (60%). However, the producers rate their satisfaction with the availability of seed in small packages for bean (38%) and soya bean (39%) as “poor”. Figure 8 shows a breakdown of the percentage of seed sold in the different package sizes for each crop.

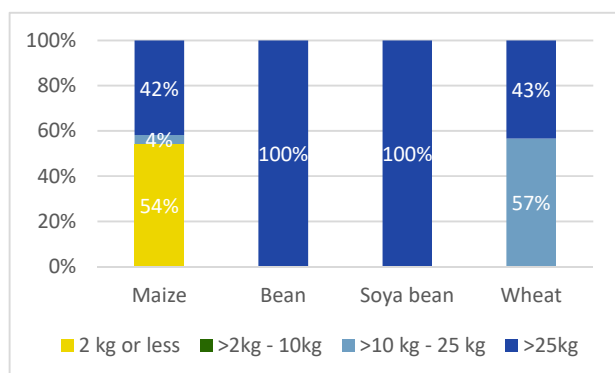


Figure 7: Percentage of seed sold in different package sizes

Seed-to-grain price ratio

Assuming stable prices at planting time, the seed-to-grain price ratio can reflect the attractiveness of a variety and/or affordability of improved seed relative to farmer-recycled grain (Nagarajan & Smale, 2005). Amongst the four seed crops, hybrid maize has the highest seed-to-grain price ratio (9.9:1), which is understandable given that the costs of production and processing are higher for hybrid seed. In addition, most hybrid maize is imported into Rwanda. The second highest ratio was measured for OPV maize (3.2:1), followed by bean (2.4:1), wheat (2:1), and soya bean (1.6:1).

Figure 8 shows the prices for OPV maize in countries surveyed by TASAI. Amongst these countries, the price of OPV maize in Rwanda (US \$0.7 per kg) is one of the lowest.

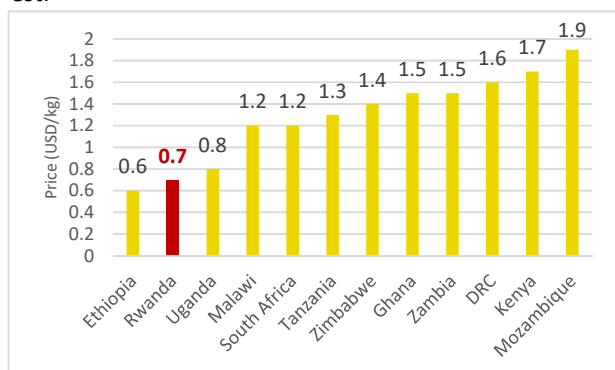


Figure 8: Average price of OPV maize seed in countries studied by TASAI

CONCLUSION

Rwanda’s seed sector is at a critical stage of growth. The current low crop yields for maize (1.5 tons/ha), wheat (1.3 tons/ha) and cassava (13.5 tons/ha), and the low utilization of improved seed and planting materials (between 5.8% and 13.3% of small farmers in the three seasons in 2018) (National Institute of Statistics of Rwanda, 2018), 2018) clearly show that there is substantial room for growth in the industry. TASAI has identified three critical enabling factors in Rwanda’s seed industry that are already in place to contribute to this growth.

The first is a **demonstrated commitment on the part of the government** to enable a well-functioning seed sector. Rwanda’s government has shown a strong commitment to increasing agricultural production and productivity in the country through steady support for programs such as the Crop Intensification Program.

The second factor is a **well-defined legal and regulatory framework**. The legislative instruments governing plant varieties, as well as the relevant subsidiary legislation in the form of Ministerial Orders, are all in place and up to date. Furthermore, these instruments have been harmonized with the COMESA Harmonized Seed Regulations to allow for easier seed movement across the region.

The third contributor to success is a **well-functioning extension service**. The RAB’s various efforts in agricultural extension services, including the *Twigire Muhinzi* model, has achieved notable successes, reaching close to 90% of agricultural households within the country.

Despite these positive factors, the sector still faces significant challenges.

The first challenge is the **incomplete implementation of policy instruments**. Several key aspects of seed legislation and regulation are yet to be fully implemented. Various institutions and bodies are not yet fully operational, including the National Plant Variety, Evaluation, Certification and Registration Committee (NVRC), which is supposed to oversee the plant variety release process, and the Rwanda Inspection and Competitiveness Agency (RICA), which is intended to register seed producers and conduct seed inspections. Both institutions are at different stages of operationalization. By the end of 2018, RICA’s functions were still being carried out by the RAB.



Though the PVECRC met twice in 2018, it is still in its formative stages. As it grows, it will need to address several issues: clarification of the information required for applications for variety release; how to conduct the review of applications and oversee the different field tests (DUS and VCU); approval of varieties for release; and publishing of the National Plant Variety List. As the seed sector grows, there will be a need to strengthen the transparency and speed of the release process. One way would be to relegate the technical functions of the review of applications to a committee, which would then make recommendations for approval to the PVECRC as the final authority.

The second challenge is a **government-controlled seed market**. The market for quality seed is relatively controlled, as the government (for maize, wheat and soya bean) and Harvest Plus (for bean seed) are the key buyers. This strategy may be a necessary short- or medium-term measure to generate farmers' demand for quality seed. However, in the long term, the approach may not be economically sustainable for the government. In addition, the approach presents a few other problems for the private sector: (i) the private sector is unable to estimate the true effective demand for quality seed from the farmers and as such is unable to provide accurate business forecasts, (ii) the private sector does not invest in developing marketing and distribution channels for seed, which are integral to market development and business growth, and (iii) the private sector is unable to estimate the true profitability of the seed business, as seed prices are not an accurate reflection of the market forces of supply and demand.

The third challenge is the **limited degree of coordination between seed actors in the country**. The government's initiative to create a national seed consortium to serve as a platform for the coordination of activities in the sector is a step in the right direction. The consortium will address key issues and challenges in the seed industry in a structured way. Ideally, as the consortium is institutionalized within the industry, private sector players should play a more deliberate role in driving the agenda.

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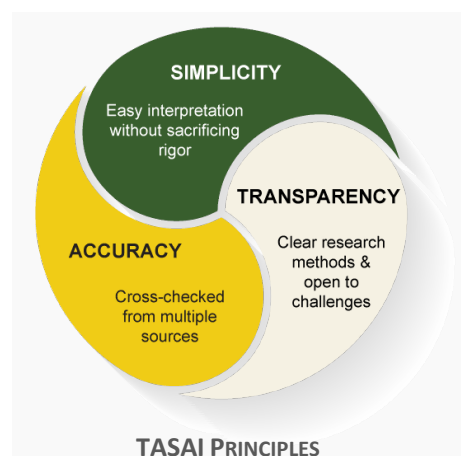
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ABOUT THE AFRICAN SEED ACCESS INDEX

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.**



By the end of 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**, government 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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Suggested citation:

Michael Waithaka, Mainza Mugoya, Gervais Nkuriza Ngerero, Clement Urinzwenimana Krisztina Tihanyi. 2019. *Rwanda Brief 2018 - The African Seed Access Index*. Available at: tasai.org/reports

The work of TASAI is supported by:

