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Burundi Country Report 2021

The African Seed Access Index

By
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TASAI
The African Seed Access Index

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Version October 2021

The findings in this report were presented to seed sector stakeholders in a TASAI dissemination meeting held in Bujumbura, Burundi, on October 25, 2021.

Cite as: Mabaya, E., Bararyenya, A., Vyizigiro, E., Waithaka, M., Mugoya, M., Kanyenji, G., Tihanyi, K. 2021. Burundi 2021 Country Study - The African Seed Access Index (version October 2021).



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LIST OF ACRONYMS:

CGIAR	Consultative Group on International Agricultural Research
CIAT	International Center for Tropical Agriculture
CNS	Commission Nationale Semencière
COMESA	Common Market for Eastern and Southern Africa
COPROSEBU	Collectif des Compagnies et Coopératives de Production des Semences du Burundi
DUS	Distinctness, Uniformity and Stability
EAC	East African Community
FAO	Food and Agriculture Organization of the United Nations
ICRISAT	International Center for Research in the Semi-Arid Tropics
IFDC	International Fertilizer Development Centre
IITA	International Institute of Tropical Agriculture
IRRI	International Rice Research Institute
ISABU	Institut des Sciences Agronomiques du Burundi
MINEAGRIE	Ministère de l'Environnement, de l'Agriculture et de l'Elevage
NGO	Non-Governmental Organization
NVRC	National Variety Release Committee
ONCCS	Office National de Contrôle et de Certification des Semences
OPV	Open-pollinated varieties
PSSD	Private Seed Sector Development
VCU	Value for Cultivation and Use



INTRODUCTION

The increased use of productivity-enhancing technologies, including mechanization, irrigation, fertilizer and improved seed, is critical to improving food and nutritional security across Africa. For field crops, a competitive formal seed sector is key to ensuring the timely availability of high-quality seed of improved, appropriate varieties at affordable prices for smallholder farmers. Improved seed can deliver state-of-the-art technology to farmers including higher yields, disease and pest resistance, climate change adaptation, reduced post-harvest losses, and improved nutrition. To facilitate the delivery of these benefits to smallholder farmers, The African Seed Access Index (TASAI) conducts seed industry assessments at the national level and uses the findings 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 in Africa.

This report summarizes the key findings of the study conducted by TASAI in 2018/19 and updated in 2021 to appraise the structure and economic performance of Burundi's formal seed sector. TASAI studies focus on the four grain and legume crops important to a country's food and nutritional security (the "four focus crops"). In Burundi, these crops are maize, bean, rice, and wheat. According to the Food and Agriculture Organization of the United Nations (FAO), these four crops account for 96% of the area harvested¹ under cereals and pulses in the country in 2019 (FAO, 2020).² Bean and maize are the two most important crops in Burundi, accounting for 72% and 20% of the total area harvested under cereals and legumes in 2019, respectively.

OVERVIEW OF BURUNDI'S FORMAL SEED INDUSTRY

While seed systems in most African countries consist of a formal and an informal sector, Burundi's seed system consists of three sectors: the informal, formal and intermediate sectors (Bararyenya et al., 2012). This Country Report focuses almost exclusively on the formal seed sector.

The informal sector refers to a system in which seed is produced, maintained, and distributed through informal networks. These activities "tend to be decentralized and might revolve around local entrepreneurship, seed banking, community-based seed production, or seed villages" (McGuire & Sperling, 2016). In many cases, farmers keep seed from the harvest and exchange it with neighbors,

relatives, and through rural markets. Seed from this system is of variable varietal purity, physical and sanitary quality.³

The intermediate seed sector refers to the production and marketing of seed by community-based organizations, farmer's groups, and individual farmers. Although these producers grow both local and improved varieties, the seed is neither inspected nor certified by the government (Bararyenya et al., 2012).

The formal sector is a structured and regulated value chain for the production of improved seed varieties. This process involves many actors and institutions, and ranges from the breeding of varieties to the multiplication, processing, and distribution of certified seed. The different stages of improved seed production are regulated by governments, based on approved regulations and standards. The sale of seed from this system takes place through limited distribution channels such as registered seed producers/companies, government distribution, and agro-dealers. In recognition of the importance of quality improved seed to agricultural development, the government of Burundi has instituted several measures to increase agricultural productivity by enhancing access to improved seed over the years. Notable among these measures are the National Agricultural Strategy 2018-2027 and related action plans (République du Burundi, 2018), the National Agricultural Inputs plan 2018-2022 (MINEAGRIE, 2018), the National Seed Subsidy Program (PNSSB) (MINEAGRIE, 2016), and the Private Seed Sector Development (PSSD) project. The PSSD project developed public and private partnerships to promote the development of a private sector led seed industry in Burundi.⁴

3 See seed system definitions at <https://www.agrilinks.org/post/seed-system-definitions>
4 <https://ifdc.org/projects/private-seed-sector-development-pssd/>

¹ This excludes areas where crops were planted but where no harvest has taken place, either due to damage (from pests or diseases) or crop failure (as a result of floods or drought).

² FAOSTAT <http://www.fao.org/faostat/en/#data/QC>





Table 1 lists the agencies in charge of various aspects of Burundi's seed industry. Variety development is the remit of the *Institut des Sciences Agronomiques du Burundi* (ISABU). Seed certification is conducted by the *Office National de Contrôle et de Certification des Semences* (ONCCS), a parastatal under the *Ministère de l'Environnement, de l'Agriculture et de l'Elevage* (MINEAGRIE). Seed cooperatives under the *Confédération des Associations des Producteurs Agricoles pour le Développement* (CAPAD) play a key role in seed production, training, and the provision of extension services to farmers. The International Fertilizer Development Center (IFDC) supports education, training and extension through the the PSSD project. The *Collectif des Compagnies et Coopératives de Production des Semences du Burundi* (COPROSEBU) is the national seed trade association in Burundi.

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

ROLE	KEY PLAYERS
Research and breeding	Institut des Sciences Agronomiques du Burundi (ISABU), Consultative Group on International Agricultural Research (CGIAR) centers
Variety release and regulation	Commission Nationale Semencière, (CNS), Office National de Contrôle et de Certification des Semences (ONCCS), Ministère de l'Environnement, de l'Agriculture et de l'Elevage (MINEAGRIE)
Seed production and processing	Collectif des Compagnies et Coopératives de Production des Semences du Burundi (COPROSEBU), seed companies, individual seed producers, seed cooperatives, Confédération des Associations des Producteurs Agricoles pour le Développement (CAPAD)
Education, training, and extension	CAPAD, MINEAGRIE, Non-Governmental Organizations (NGOs), IFDC
Distribution and sales	Seed producers, seed companies, agro-dealers



METHODS

TASAI studies cover 22 indicators divided into five categories: **Research and Development, Industry Competitiveness, Seed Policy and Regulations, Institutional Support, and Service to Smallholder Farmers**⁵ (Table 2). In most TASAI studies, the bulk of the performance data reported comes from the year before when the study is conducted (“the study year”) because that is the year for which the most recent data are available. The study was conducted in 2018/19. However, information on selected indicators was updated in 2021.

Table 2: TASAI Indicators

	Crop-specific	Impact on seed access	Collected in 2018	Collected in 2021	
A RESEARCH AND DEVELOPMENT					
A1	Adequacy of active breeders	Yes	+	√	x
A2	Number of varieties released	Yes	+	√	√
A3	Number of varieties with ‘special’ features	Yes	+	√	√
A4	Availability of basic seed	Yes	+	√	x
B INDUSTRY COMPETITIVENESS					
B1	Number of active seed companies/producers	Yes	+	√	√
B2	Quantity of seed produced and sold	Yes	+	√	√
B3	Number of varieties sold and dropped	Yes	+	√	x
B4	Average age of varieties sold	Yes	-	√	x
B5	Market concentration	Yes	-	√	x
B6	Market share of state-owned seed company	Yes	-	√	x
B7	Efficiency of seed import/export processes	Yes	+	√	x
C SEED POLICY AND REGULATIONS					
C1	Length and cost of variety release process	Yes	-	√	x
C2	Status and implementation of national seed policy framework	No	+/-	√	√
C3	Harmonization with regional regulations	No	+	√	√
C4	Adequacy of efforts to eradicate counterfeit seed	No	+	√	√
C5	Use of government subsidies	No	+/-	√	√
D INSTITUTIONAL SUPPORT					
D1	Performance of national seed association	No	+	√	x
D2	Adequacy of seed inspection services	No	+	√	x
E SERVICE TO SMALLHOLDER FARMERS					
E1	Availability of agricultural extension services for smallholder farmers	No	+	√	√
E2	Concentration of agro-dealer network	No	+	√	√
E3	Availability of seed in small packages	Yes	+	√	x
E4	Seed-to-grain price ratio at planting time	Yes	-	√	x

⁵ The list of indicators and recent TASAI data are available of https://tasai.org/wp-content/uploads/TASAI-Appendix_CURRENT.pdf



To assess the progress of Burundi’s formal seed sector, this Country Report draws comparisons between the 2017 and 2021 data. However, these comparisons are limited to select indicators for which data was collected in 2021. In addition, since TASAI has conducted similar studies in 20 other African countries to date, this report also draws relevant cross-country comparisons.





Using TASAI survey tools, data collection in 2018 focused on three key seed industry players: seed companies, plant breeders, and representatives of government entities active in the country’s seed sector. Of these, seed producers were the primary source of information. For several indicators, TASAI supplemented quantitative data with self-reported levels of industry satisfaction on a scale of 0-100, with the following brackets: 0-19.99% **extremely poor**, 20-39.99% **poor**, 40-59.99% **fair**, 60-79.99% **good**, and 80-100% **excellent**.

In 2018, Burundi had a total of 140 seed producers. Among these there were 60 active maize seed producers, 54 bean seed producers, 26 rice seed producers and 2 wheat seed

producers (Table 3). The active producers were registered with the ONCCS, where they regularly reported their seed production. Of these, TASAI surveyed 42 seed producers - 22 individual producers, 15 from seed cooperatives and 5 seed companies located in 14 of Burundi’s 17 provinces, covering large parts of the country. Although the 2021 update did not include visits to seed producers, TASAI was able to collect information on the number of registered producers by crop. According to the ONCCS, the number of seed producers increased for all crops between 2018 and 2020. This indicates that there is growing interest in the production of certified seed, especially for hybrid maize.

In addition to the seed producers, the 2018 study also surveyed the key government institutions including MINEAGRIE, the ONCCS, which is the agency in charge with seed inspection and certification, and ISABU, the country’s national agricultural research institute. The study also surveyed COPROSEBU, the platform for seed producers in the country. In 2021, all these actors were interviewed, with the exception of seed producers.

Table 3: Breakdown of active seed companies

Crop	Number of seed producers in 2020		Number of seed producers in 2018	
	Companies	Other producers	Companies	Other producers
 Maize	3	80	4	56
 Bean	1	64	1	53
 Rice	1	30	1	25
 Wheat	1	8	1	1
Total	5*		4*	

* The total number of seed companies is lower than the sum of the number of seed companies listed by crop because seed companies often produce seed for multiple crops.



RESEARCH AND DEVELOPMENT

NUMBER OF ACTIVE BREEDERS

A functioning seed system needs vibrant public and private breeding programs to develop improved varieties that respond to farmer and consumer needs. The number of active breeders is indicative of the level of investment in research and development.⁶ In addition to tracking the number of breeders working on the four focus crops, this study also measures the level of satisfaction reported by producers (seed companies, individual producers, and cooperatives) with the public breeding programs. The latter often reflects the ability of active breeders in public institutions to produce new varieties.

Table 4 shows the number of and seed producers' satisfaction with active breeders. Burundi had nine active breeders for the four focus crops in both years. In 2021, there were three maize breeders, three bean breeders, two rice breeders and one wheat breeder. Of these, seven breeders were employed by ISABU, the public national agricultural research institute. ISABU's breeding programs are underfunded and most are supported by several CGIAR centers, namely the International Rice Research Institute (IRRI), the International Institute of Tropical Agriculture (IITA), the International Center for Research in the Semi-Arid Tropics (ICRISAT) and the International Centre for Tropical Agriculture (CIAT). Two maize breeders were employed by a private seed company. In addition to the nine breeders, the IITA employed one maize breeder and the IRRI employed two rice breeders.





⁶ TASAI studies define an "active breeder" as a breeder who is currently engaged in breeding/maintaining a variety or a breeder who had either developed and released at least one variety or was developing a variety of the crop of interest at the time of the TASAI study.

Despite such support, ISABU's research activities are constrained by the overall shortage of breeders. This shortage slows down the development of new varieties and the maintenance of existing varieties. In 2018, the only breeding program running in the country's universities was a rice breeding program supported by the IRRI. According to the breeders, the breeding programs could be strengthened by hiring more breeders overall and initiating collaborations with some of the new private companies that specialize in the production of basic seed in the region. Furthermore, as breeding capacities improve, breeding programs could be enhanced by strengthening existing collaborations with the CGIAR centers in the country to address the shortage of breeders. It is worth noting that the foreign-owned companies that are operational in Burundi rely on their own breeders, who are based in other countries in the region.

In 2018, seed producers rated their satisfaction with the adequacy of active breeders in public institutions in producing new varieties as "good" for three crops: rice (68%), bean (66%) and wheat (61%), while satisfaction with the production of maize varieties was rated "fair" (57%).

Figure 1 shows the number of active maize breeders in selected African countries. After bean, maize is the second most important food crop in the country by area harvested. However, the number of active maize breeders in Burundi is very low in comparison to other countries where TASAI studies have been conducted. The number of maize breeders in Burundi should be increased if the country expects to develop hybrid maize varieties.

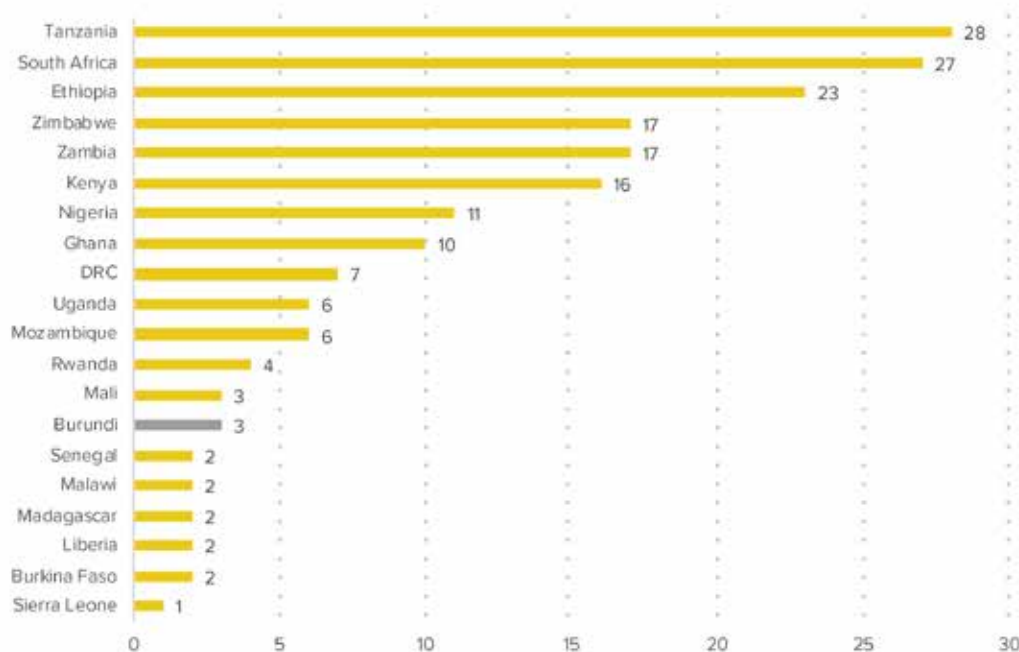
Table 4: Number and adequacy of active breeders

Crop	Number of active breeders in 2018			Number of active breeders in 2021			Satisfaction rating in 2018 (%)
	Public	Private	Total	Public	Private	Total	
 Maize	1	0	1	1	2	3	57%
 Bean	3	0	3	3	0	3	66%
 Rice	4	0	4	2	0	2	68%
 Wheat	1	0	1	1	0	1	61%
Total	9	0	9	7	2	9	

extremely poor poor fair good excellent



Figure 1: Number of active maize breeders in selected African countries (study years range from 2016-2021)



VARIETIES RELEASED IN THE LAST THREE YEARS

The number of varieties released is a good measure of the performance of the variety development and release system. This indicator (number of varieties released in the last three years) is crop specific, and the greater the number of varieties released in a country, the higher the chances of enhancing smallholders' access to improved seed. In addition to higher yields, new varieties often carry desired traits such as climate smartness, disease/pest resistance, and nutrition-enhancement.

A total of 84 varieties of the four focus crops were released during the period 2000-2020: 20 maize varieties, 32 bean varieties, 24 rice varieties, and 8 wheat varieties. The national variety catalogue lists the released varieties and their descriptions (ONCCS, 2020). Figure 2 illustrates the 3-year moving averages of crop varieties released between 2000 and 2020. Between 2018 and 2020, a total of 26 varieties

were released: 7 maize, 10 bean, 8 rice, and 1 wheat varieties. However, across the four crops, no varieties were released in certain years.

The number of varieties released for the four crops over the last 20 years has been very low due to the government's under-investment in public breeding programs. Although there has been a surge in the number of releases since 2016, in the last two years, the number of releases of maize, bean and rice varieties decreased. Most of the releases of maize, bean, and rice seed by ISABU have been a result of collaboration with various CGIAR centers.

Figure 3 shows the number of rice varieties released in the last three years in the countries surveyed by TASAI. The number of rice varieties released in Burundi between 2018 and 2020 is among the highest, following Mali and Madagascar. This finding is important as it suggests that rice breeding programs in Burundi have the potential to produce more improved varieties if they are well funded.

Figure 2 Trend in number of varieties released (3-year moving average)

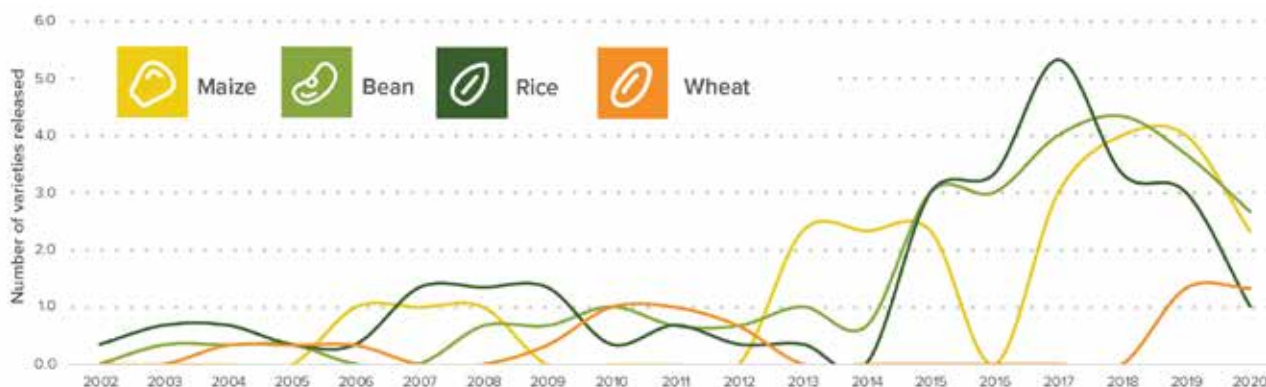
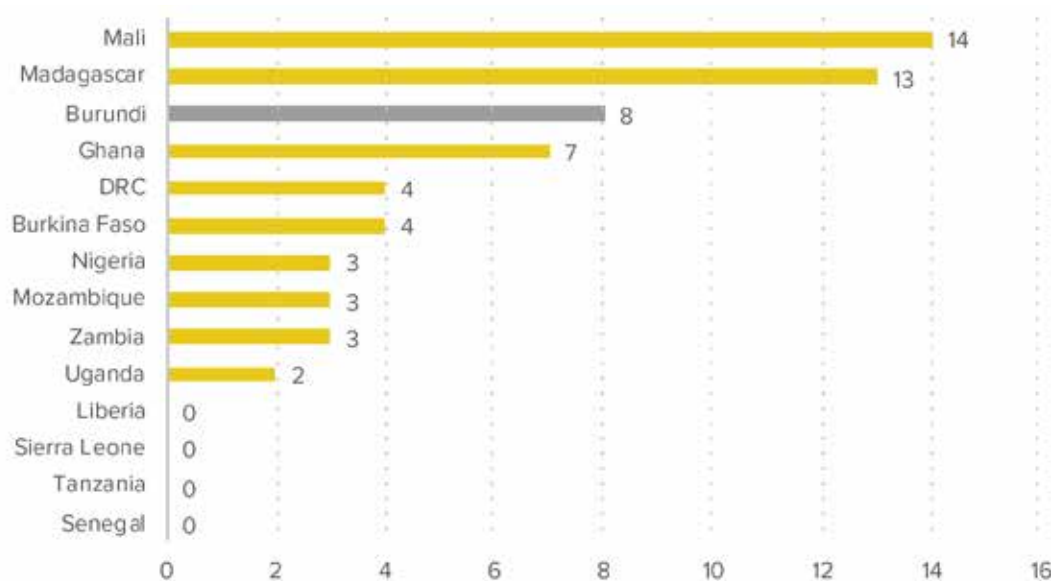




Figure 3: Number of rice varieties released in the last three years, in countries surveyed by TASAI



VARIETIES WITH SPECIAL FEATURES

Varieties may have special characteristics, for instance climate-smart, fast-cooking and nutrition-enhanced, or industry-demanded features. While acknowledging the increase in biotic stresses (pests, weeds and diseases) due to climate change, TASAI studies narrowly define “climate-

smart features” as those that respond to extreme weather events, such as droughts, floods and frost, that affect current farming practices. Examples of climate-smart features are drought tolerance, early maturity, or extra-early maturity. Table 5 shows the number of varieties released between 2018 and 2020 that have special features. In these years, a total of 11 varieties with special features were released – 4 maize varieties, 6 bean varieties and 1 wheat variety. None of the rice varieties had special features.

Table 5: Number of varieties released that have special features

Feature	Description of feature	Number of varieties released 2018 - 2020				
		Maize	Bean	Rice	Wheat	TOTAL
All varieties released		7	10	8	1	26
All varieties released with special features		4	6	0	1	11
Climate smart features	All climate-smart features	4	3	0	1	8
	Drought tolerant	2	0	0	1	3
	Early / extra-early maturing	2	3	0	0	5
Fast-cooking and nutrition-enhanced attributes	All fast-cooking and nutrition-enhanced features	0	3	0	1	4
	Fast-cooking	0	3	0	0	3
	Nutrition-enhanced features	0	0	0	1	1
Industry-demanded features	All industry-demanded features	0	0	0	0	0
	Grits for the breweries	0	0	0	0	0

NUMBER OF VARIETIES SOLD IN 2017

An increase in the number of varieties sold in a country often reflects an increase in the range of varieties available to farmers. Table 6 shows the number of varieties sold for each crop in 2017 and lists the most popular⁷ varieties. The seed producers surveyed reported selling a total of 14 maize varieties, 24 bean varieties, 11 rice varieties and 4 wheat varieties to farmers in 2017. The most popular maize varieties were ISEGA and ZM 605. Both are open-pollinated varieties (OPVs) released in 2000. Two hybrid varieties, Longe 7H and Longe 10H, are gaining popularity because of their high yield.

7 Popularity is based on the number of seed companies selling each variety.

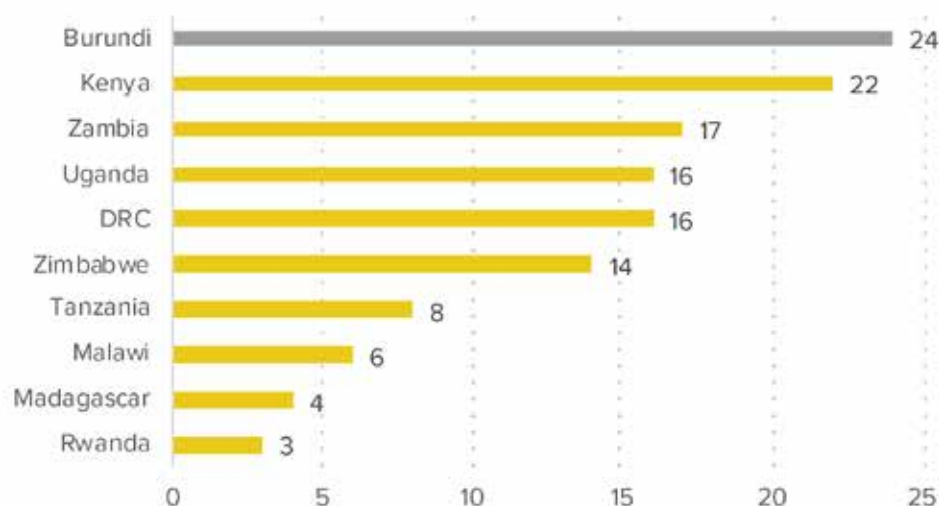
The most popular bean varieties sold in 2017 were the biofortified variety MAC 44, yellow bean varieties Gisozi 611 and ISO201245, and the sugar bean varieties Gasilida and Mukungugu. The four most popular rice varieties were sold by the same percentage of seed producers. The most popular wheat varieties were 1st ISW SN64 and 11th HRWYT12.

Compared to other African countries where the TASAI study has been conducted (and where bean was a focus crop), the number of bean varieties sold in Burundi is the highest (Figure 4). This is mainly because the bean research program at ISABU has been supported by CIAT under the Pan African Bean Research Alliance (PABRA). Through this collaboration, ISABU has received bean germplasm and capacity-building support.

Table 6: Name of popular varieties sold

Crop	Number of varieties sold in 2017	Name of popular variety sold	% of seed producers selling variety in 2017	Age of variety (years) in 2017	Average age of popular varieties
Maize	14	ISEGA	49%	30	15.8
		ZM 605	22%	11	
		ZM 621	16%	11	
		Ecavel 1	16%	11	
Bean	24	MAC 44	33%	2	9.0
		Gisozi 611	33%	-	
		ISO201245	25%	18	
		Gasilida	21%	7	
		Mukungugu	21%	9	
Rice	11	L662-3-9	25%	10	9.5
		L699-1-1	25%	10	
		Tox3154-17-1-3-2-2	25%	8	
		V18	25%	10	
Wheat	4	1st ISW SN64	70%	8	7.5
		11th HRWYT12	50%	7	

Figure 4: Number of bean varieties sold in study year (study year ranges from 2016-2020)



AVERAGE AGE OF VARIETIES SOLD





In vibrant seed systems, farmers regularly replace old varieties with new ones. In many African countries, old varieties persist, despite the fact that newer varieties often outperform older varieties as they are bred for traits that respond to the demands of farmers, consumers, and industry. A lower average age of varieties signals higher rates of variety turnover. TASAI tracks the average age of varieties by crop.

The average age of the varieties on the market in 2017 was 10.8 years for maize, 6.7 years for bean, 5.5 years for rice and 8.8 years for wheat. The average age of popular varieties was: 15.8 years for maize, 9.0 years for bean, 9.5 years for rice and 7.5 years for wheat. Table 7 presents the average age of varieties sold in 2017. All of the popular varieties sold in 2017 were released in or after the year 2000.

SOURCES AND AVAILABILITY OF FOUNDATION (BASIC) SEED

Seed producers use basic seed to produce certified seed for sale to farmers. In many African countries, limited access to basic seed from public research institutions tends to constrict the ability of seed companies to scale up production. In Burundi in 2021, the general process to obtain basic seed starts with the producer applying to the research institution that produces or supplies the particular basic seed, specifying the crop, variety, and quantity needed. The seed producer pays 10% of the cost of the quantities of seed needed. The research institution invoices the producer for the basic seed, and upon payment, the producer receives the seed. The *Commission Nationale Semencière (CNS)* was established by Decree





Table 7: Average age of popular varieties sold

Crop	Number of varieties sold in 2017	Average of all varieties sold	Average Age of Popular Varieties
 Maize	14	10.8	15.8
 Bean	24	6.7	9.0
 Rice	11	5.5	9.5
 Wheat	4	8.8	7.5

N° 100-251 of September 2012 as the highest advisory body tasked with the general supervision, registration, and coordination of all seed activities in Burundi (République du Burundi, 2012a). The CNS comprises the key actors in the seed sector including ISABU, the ONCCS, and CAPAD, among others. The commission determines, among others, the volume of basic seed to be distributed to the seed producers in the different provinces.

Table 8 shows the seed producers' satisfaction with the availability of basic seed in 2018. On average, seed producers rated their satisfaction with the availability of basic seed and planting material as "excellent" for rice (83%) and "good" for maize (76%), bean (67%) and wheat (71%). All seed producers sourced their basic seed from ISABU. Other sources included the CGIAR centers IITA, IRRI, ICRISAT, and CIAT. These centers supply seed to ISABU, which in turn supplies seed to producers. The two foreign-owned seed companies in Burundi in 2018 were seed importers and did not produce any certified seed in the country.

Table 8: Seed producers' satisfaction with availability of basic seed in 2018

Crop	Satisfaction rating (out of 100%)	Interpretation of satisfaction
 Maize	76	Good
 Bean	67	Good
 Rice	83	Excellent
 Wheat	71	Good





INDUSTRY COMPETITIVENESS

NUMBER OF ACTIVE SEED PRODUCERS

Competition breeds excellence: the presence of more active seed companies increases competition and creates incentives for companies/producers to innovate and improve service delivery. A vibrant seed sector depends on a robust private sector in which seed companies invest in developing, producing, processing, and marketing improved varieties to farmers. This section tracks the number of registered seed companies/producers that produced and marketed seed of one or more of the focus crops.

In Burundi, seed producers fall into three categories: seed companies, individual seed producers, and seed cooperatives. The three categories are all registered by the ONCCS as seed producers. Table 9 presents a comparison of the number of active seed producers in 2018 and 2020. According to the ONCCS, the total number of registered and active seed producers has increased for all four crops. The increase can be partly attributed to an improvement in the overall organization of the formal seed sector through the enactment of the several decrees and ordinances, as explained in the section on the status and implementation of the national seed policy framework. Despite this increase, the number of active seed companies is still very low, increasing from four in 2018 to five in 2020. Of the five active seed companies in 2020, three were foreign-owned and imported certified seed from their home countries for commercialization in Burundi. The foreign companies all marketed hybrid maize seed. One local seed company produced and sold hybrid maize seed.

Table 9: Breakdown of active seed companies

Crop	Number of seed producers in 2020		Number of seed producers in 2018	
	Companies	Other producers	Companies	Other producers
 Maize	3	80	4	56
 Bean	1	64	1	53
 Rice	1	30	1	25
 Wheat	1	8	1	1
Total	5*		4*	

* The total number of seed companies is lower than the sum of the number of seed companies listed by crop because seed companies often produce seed for multiple crops.





PRODUCTION AND SALE OF CERTIFIED SEED

To measure the overall size of a country's seed sector, TASAI tracks the volumes of seed produced and sold for the four focus crops. The data are presented as aggregate quantities in metric tons (MT) of certified seed produced and sold in the data collection year, as reported by active

seed producers. Table 10 compares the volume of seed produced in 2017 and 2020. It also shows seed sales data for 2017, which was collected by interviewing seed producers. Most of the seed sales in 2017 concerned maize and bean seed. The volumes of rice seed and wheat seed sold in 2017 were low. Similarly, according to the ONCCS, maize and bean seed accounted for the largest share of seed produced in 2020. No wheat seed was produced in 2020. One important change in 2020 was the production of maize hybrid seed for the first time in Burundi.



Table 10: Seed production and sale

Crop	Seed production in 2017 (TASAI data) in MT	Seed sales in 2017 (TASAI data) in MT	Seed production in 2020 (ONCCS) in MT
 Maize	3,655	1,298	550
 Bean	971	964	708
 Rice	43	32	70
 Wheat	19	19	0

MARKET CONCENTRATION

Competition among seed producers benefits farmers via lower prices, wider choices, increased innovation, and better customer service. To assess the level of market concentration, TASAI uses seed sales data for each crop, as reported by seed producers, to calculate the market share of the four largest firms, also known as four-firm concentration ratio (CR4), and the Herfindahl-Hirschman Index (HHI).⁸

In 2017, the market shares for the top four producers were 96% for bean, 90% for maize, 79% for rice, and 77% for wheat

⁸ See below Table 11

(Figure 5). These shares show that the top four seed producers for maize and bean dominate the seed market for that crop.

In the case of the HHI, the lower the score, the more competitive the market. Table 11 shows the HHI scores in 2017 in Burundi. The HHI scores were 8,885 for bean, 4,418 for maize, 3,689 for wheat and 2,160 for rice seed. HHI scores are extremely high for bean and maize and high for wheat, indicating high levels of market concentration, and hence low levels of competition. The high HHI score for wheat is mainly due to there being few (10) wheat seed producers in the country. For rice, the score is moderate, indicating competitiveness. Combined with the “top four” market share data, the HHI scores indicate that the markets for maize and bean have a very low level of competition with few seed producers dominating the market.

Figure 5: Market share of the top four seed producers in 2018

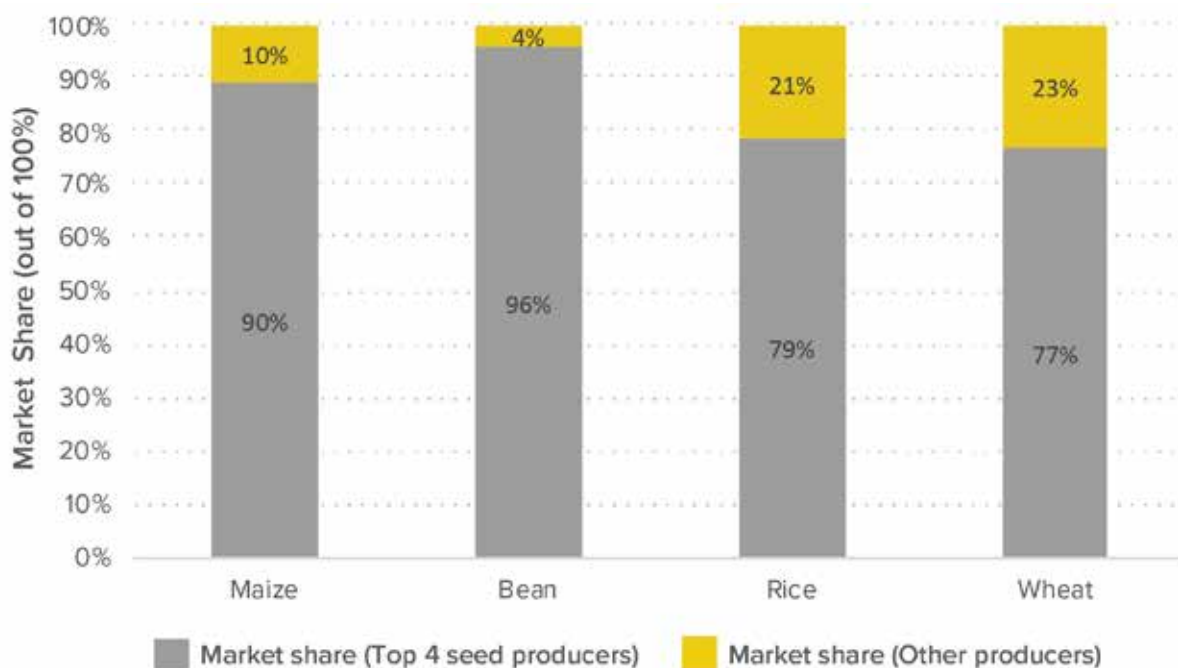








Table 11: HHI scores

Crop	HHI (2017)	Interpretation
 Maize	4,418	Extremely high
 Bean	8,885	Extremely high
 Rice	2,160	Average
 Wheat	3,689	High

The HHI is a measure of market concentration and is calculated by squaring the market share of each firm competing in a market, and then adding up the results. It ranges from close to zero for perfect competition to 10,000 for monopoly. The scale for HHI scores, ranges from extremely low to extremely high levels of market concentration: less than 1,000 is **extremely low**, 1,000-1,999 is **low**, 2,000-2,999 is **moderate**, 3,000-3,999 is **high**, and greater than 4,000 is **extremely high**, i.e., monopoly or near monopoly.

MARKET SHARE OF GOVERNMENT PARASTATAL

In some countries, public entities are still active players in the marketing and sale of certified seed. Public seed companies can play a critical role in supplying varieties that farmers desire, which private seed companies may consider to be less profitable. They also tend to support multiple national objectives such as university training and research, in addition to seed production. However, state-owned companies may benefit from preferential treatment, less stringent enforcement of regulations, access to competitor information, and indirect production subsidies. Collectively, these privileges can result in unfair competition against purely private seed companies. In Burundi there was no government parastatal active in the production and marketing of certified seed in 2018. However, two government parastatals – the *Société Régionale de Développement de l’Imbo* (SRDI) and PASS Kajondi – both of which operated as seed companies in the past, were facilitating the private sector’s engagement in the seed industry by providing land and technical knowledge in crop production to seed cooperatives and individual seed producers.

SEED IMPORT AND EXPORT PROCESS

Efficient seed import and export processes extend the seed market beyond national borders. While seed companies benefit from an expanded market, farmers can access a wider range of varieties from across the region. In 2017, four seed companies and MINEAGRIE imported seed into Burundi. All seed imported was maize seed. The total volume of imports was 239 MT, of which 140 MT came from Uganda, 15 MT from Kenya, and 84 MT from Zambia.

The average length of the import process was 27 days. However, there was significant variation in the reported length of the import process; two of the four seed-importing companies reported the length of the import process as 12 to 13 days, while the other two reported 40 to 44 days. The average length of the import process in Burundi is among the highest in the region, notably higher than other countries in the East African Community (EAC) such as Uganda (17 days), Tanzania (12 days), Kenya (10 days) and Rwanda (2 days).

On average, the importing seed companies rated the import process as “fair” (54%). However, there was a high degree of variance in the companies’ level of satisfaction with the process: the two seed companies that reported long import processes gave low ratings of 30% and below, whereas the two companies that reported shorter import processes were much more satisfied, giving ratings over 70%.





SEED POLICY AND REGULATIONS

LENGTH OF VARIETY RELEASE PROCESS

Plant variety release is the process during which new varieties undergo tests for yield, Value for Cultivation and Use (VCU), and Distinctness, Uniformity, and Stability (DUS). Varieties that perform satisfactorily in these tests are approved for release by the National Variety Release Committee (NVRC). A vibrant seed sector has a functional variety release system that is well understood by the relevant actors and is followed diligently. Lengthy and/or costly variety release processes can limit the number of released varieties, which can adversely affect farmer choice. The length of the variety release process is calculated from the date the variety is submitted to the NVRC to the date when the variety is approved for release. The calculation does not include the time the breeder spends developing the variety.

In Burundi, the NVRC is in charge of the variety release process. The NVRC is a technical sub-committee of the CNS, which operates as an independent body and includes stakeholders such as farmers, breeders and official institutions. Apart from reviewing the registration and release of new varieties, the NVRC maintains the national variety catalogue and monitors the uptake and performance of recently released varieties. The ONCCS serves as the secretariat for the NVRC.

In Burundi, a variety that has been developed locally by ISABU only requires one season of testing for DUS and VCU. In addition, varieties developed within the EAC⁹, also require only one season of DUS and VCU testing before submission to the ONCCS for variety release. Varieties that were developed outside the EAC require two seasons of testing.

In 2017, the length of the variety release process ranged from 12 months (for local and EAC varieties) to 25 months (for varieties developed outside of the EAC). On average, seed companies' satisfaction with the variety release process was "fair" (47%). The main reason for the low satisfaction level was the high cost of the variety release process, discussed in the next section. In contrast, ISABU rated the process "good" (78%).

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⁹ EAC countries include Kenya, Rwanda, South Sudan, Tanzania and Uganda.





COST OF VARIETY RELEASE PROCESS

In well-functioning seed systems, the costs of releasing a variety should not be so high as to disincentivize variety releases altogether. The ONCCS has not set any costs for variety release. The official costs for DUS and VCU tests are not specified because this cost is currently paid by the government. However, foreign companies and local breeders working under externally supported projects are required to pay the cost of transport, living costs for staff who run the on-farm trials, site management, crop assessments, and evaluation.

While the variety release process is free, in 2017, ISABU breeders reported spending between US\$ 1,800 and US\$ 7,000 per variety on living costs for staff to maintain the field sites, and transportation and accommodation costs for officials conducting the variety assessments. ISABU, which released most varieties, incurred, on average, about US\$ 6,000 in expenses for the release of each new variety.

In comparison with other countries studied by TASAI, the average total cost for the variety release is similar to amounts recorded in Kenya (US\$ 3,000) (Mabaya et al., 2021a) and Mali (US\$ 7,031) (Mabaya et al., 2021b), and is substantially lower than those reported in Nigeria (US\$ 18,280) (Mabaya et al., 2021c) and Ghana (US\$ 41,668) (Mabaya et al., 2021d).

STATUS AND IMPLEMENTATION OF NATIONAL SEED POLICY FRAMEWORK

Well-functioning formal seed sectors have effective coordinating institutions that work well together, following rules and procedures stipulated in clearly defined and regularly updated legal instruments.

In Burundi, the law governing the seed sector is Law N° 1/08 of April 23, 2012, on the Organization of the Seed Sector (République du Burundi, 2012b). Enacted in 2012, the law establishes the key institutions and outlines the processes for various seed services through decrees and ordinances. These include:

- Decree N° 100/251 of September 2012 on the Creation, Organization and Functioning of Commission Nationale Semencière (CNS) (République du Burundi, 2012a). The CNS is under the authority of the Minister in charge of Agriculture and Livestock and is the highest-ranking advisory body for the general supervision, regulation and coordination of all activities seed companies in the country.

- Ordinance N° 770/183 of February 19, 2015 on the Accreditation for Seed Certification (MINEAGRIE, 2015) This ordinance sets up the accreditation system for seed certification. It formalizes the delegation of the officers conducting field inspections, seed sampling, including the labeling and sealing of packages, as well as seed testing.
- Ordinance N° 710/450 of April 4, 2016 on the Seed Certification System (MINEAGRIE, 2016a). This ordinance regulates the certification of crop varieties.
- Ordinance N° 710/449 of April 4, 2016 on the Inclusion of Species and Varieties in the Burundi National Variety Catalogue (MINEAGRIE, 2016b). This ordinance determines the conditions for the registration of species and plant varieties in the National Catalog; and
- Ordinance No 710/339 of March 9, 2016 on the Criteria for Approval of Producers of Certified Seed (MINEAGRIE, 2016c). This ordinance establishes the criteria for the approval of a producer of certified seed.
- The National Seed Plan (MINEAGRI/CTB, 2009) was set out to strengthen seed sector coordination, production of improved seed by the public and private sector and involvement of the private sector in marketing of seed. The process of updating of this strategy is underway.

QUALITY AND ENFORCEMENT OF SEED REGULATIONS

Seed regulations give structure to the formal seed sector. The TASAI study assesses stakeholder perspectives on various aspects of seed regulations, including whether they are supportive to the growth of the seed sector, the role stakeholders play in their design and implementation, stakeholders' awareness of the laws and regulations, the presence of an enforcement agency, the costs of regulation, and the effectiveness of punitive measures.

In 2017, seed producers in Burundi were generally satisfied with the quality of the current seed laws, ordinances and decrees, rating them as "good" (70%). However, the producers were less satisfied with the enforcement of ordinances and decrees, rating this as "fair" (55%). The ONCCS, which is mandated to enforce the seed law, is constrained by limited funding and a lack of qualified personnel to take on the required functions, including seed inspection.

Implementation of regional regulations

Burundi is a member of both the EAC and the Common Market for Eastern and Southern Africa (COMESA). Both regional blocs are harmonizing seed regulations, but the COMESA process is more developed. The COMESA Seed Trade Harmonized Regulations were approved in 2014 (COMESA, 2014). Burundi's Ordinance N° 710/450 of April 4, 2016, on the country's seed certification system, was harmonized in line with the COMESA Seed Trade Regulations. One of the main benefits of implementing the COMESA Seed Trade



Regulations is that it allows member countries access to improved varieties from across the COMESA region: according to the COMESA Regulations, if a variety has been released in at least two COMESA member states, it can be traded within the entire COMESA region without undergoing further tests.

The EAC is currently finalizing the EAC Seed Bill and the corresponding EAC Seed Regulations. The bill was referred to the EAC Sectoral Council of Legal and Judicial Affairs by the 38th EAC Council of Ministers in May 2019 for review. Thereafter, it will be forwarded to the East African Legislative Assembly (EALA), the parliament of the EAC, to be debated and passed into law.

EFFORTS TO ERADICATE COUNTERFEIT SEED

Counterfeit seed (also known as fake seed) threatens the seed sector in two important ways. First, it reduces farmers' confidence in certified seed due to cases in which farmers unknowingly plant inferior quality grain labeled as certified seed. Second, it threatens the success of efforts to increase the adoption of improved varieties because farmers are not sure of which seed is genuine. TASAI tracks the number of cases of counterfeit seed reported by seed companies and the government in the data collection year and asks seed producers to report their level of satisfaction with government efforts to eliminate counterfeit seed.

Table 12 shows the number of cases of counterfeit seed and rating of government's efforts to address the issue in 2018. Seed producers in Burundi reported receiving a total of 33 reports of counterfeit seed sales. According to the seed producers, the main sources of counterfeit seed were agro-dealers, who repackage seed in used bags, and some seed producers who deliberately mix seed with grain. On average, seed producers were not satisfied with the government's efforts to stamp out counterfeit seed, rating them as "fair" (50%). The ONCCS is mandated to conduct seed inspections and to monitor the quality of seed on the market, but the agency continues to lack sufficient funds to conduct these activities and does not have a system for tracking cases of counterfeit seed. For example, the ONCCS does not have its own seed laboratory, but instead uses a laboratory owned by MINEAGRIE. This inhibits its ability to test seed. However, the seed regulations outline measures to address this challenge. Ordinance N° 710/339 of March 2016 requires that all seed producers obtain a license before engaging in seed production. This is intended to guard against unqualified actors producing seed and to ensure that the government has a record of all registered seed producers, who can then easily be tracked. Articles 43 to 46 of the Seed Law No 1/08 of April 2012 stipulate the penalties for operating outside the law and regulations. The penalties include a fine of US\$ 50 for producing seed without being registered by the ONCCS,

and a fine of between US\$ 100 and US\$ 250 for importing seed without authorization, among other penalties. These penalties are too low to act as an effective deterrent.

Table 12: Number of cases of counterfeit seed and rating of government effort to address them

Indicators	2018
Number of cases of counterfeit seed (reported by seed producers)	33
Number of cases of counterfeit seed (reported by government)	-
Seed industry satisfaction with government effort to address counterfeit seed (out of 100%)	50%

USE OF GOVERNMENT SUBSIDIES

Seed subsidies are intended as a short or medium-term measure to encourage farmers to adopt improved crop varieties. The design and execution of subsidy programs, in terms of the scale, targeting, distribution arrangements, and payment systems, may contribute to the development of the seed market in positive ways, but it may also be disruptive to market forces.

The government of Burundi has been implementing a seed subsidy program, called *Programme National de Subventions des Semences au Burundi* (PNSSB) since 2015 (MINEAGRIE, 2016). This program was still on-going in 2021. The program only focuses on hybrid maize seed. Seed producers or suppliers who want to qualify to supply seed to the PNSSB program must be registered with the ONCCS. In addition, the seed supplied is inspected and certified by the ONCCS. The seed must be packaged and clearly labelled with details of the owner, seed type, and seed origin. The supplier delivers the seed to a designated delivery point in the destination province, which is managed by a designated coordinating organization. Farmers do not have a choice on the type of seed that they receive. The subsidy is administered as a price subsidy: the government subsidizes 40% of the seed price, while the farmers pay the remaining 60%. The seed price is determined by the CNS, whose membership consists of the ONCCS, ISABU, the University of Burundi and the *Confédération des Associations des Producteurs Agricoles pour le Développement* (CAPAD).¹⁰ The CNS meets at the start of the season to plan for the season.

¹⁰ CAPAD is a national association of farmer organizations and cooperatives. Its membership includes 26 seed-producing cooperatives.





INSTITUTIONAL SUPPORT

QUALITY OF THE NATIONAL SEED TRADE ASSOCIATION

Well-functioning national seed trade associations play a key role in representing the interests of the industry and engaging with the government. The membership of the national seed associations includes seed companies, seed cooperatives, seed associations, individual seed producers and at times agro-dealers.

The *Collectif des Compagnies et Coopératives de Production des Semences du Burundi* (COPROSEBU) is the national association of seed producers in Burundi. COPROSEBU was established in 2009 by 30 founding members and is registered with the Ministry of Interior as a not-for-profit organization. COPROSEBU is recognized by the MINEAGRIE and has registered a notable increase in membership, from 70 members in 2017 to 236 members in 2020, all of whom are seed producers. The increase was largely attributed to COPROSEBU's increased level of activity at the provincial level. This contributed to an improvement in the association's visibility among seed producers. However, only 27 out of the 42 seed producers who were interviewed in 2018 as part of the TASAI survey were members of the association. Of the 15 non-members, 7 were not aware of the association's existence. All members must be registered by the ONCCS and are required to pay a monthly membership fee of 10,000 BIF (or US\$ 5). COPROSEBU formulated and passed its constitution and internal rules of conduct in 2015. These instruments are operational and provide the guidelines for

the association's governance. The day-to-day affairs of the association are managed by a four-person secretariat under an executive secretary with guidance from a five-person board. The other staff include an accountant, a secretary, and support staff.

In 2020, COPROSEBU registered a number of important achievements. First, offices were set up in each of the 17 provinces in the country to coordinate COPROSEBU's activities. Second, COPROSEBU finalized its strategic plan for the period 2021-2027 to guide the activities of the association. Finally, COPROSEBU established a local private seed company, Setraco. The company focuses on hybrid maize varieties and produced 66 MT of seed in 2019/20 and released 4 new hybrid varieties.

Figure 6 shows members' assessment of COPROSEBU's performance in 2018. COPROSEBU members rated the overall quality of the association as "fair" (58%). The association was rated slightly higher in the areas "activity on important seed sector issues" and "effectiveness in advocacy". The main concerns raised by COPROSEBU members were undemocratic elections, inadequate managerial ability, and an inability to raise funds, all of which were rated between 51% and 55%.

As shown in Figure 7, the overall performance of COPROSEBU ranks relatively low compared to other seed trade associations in Africa. This performance can be improved if COPROSEBU addresses the concerns raised by its members.

Figure 6: Members' assessment of COPROSEBU's performance in 2018

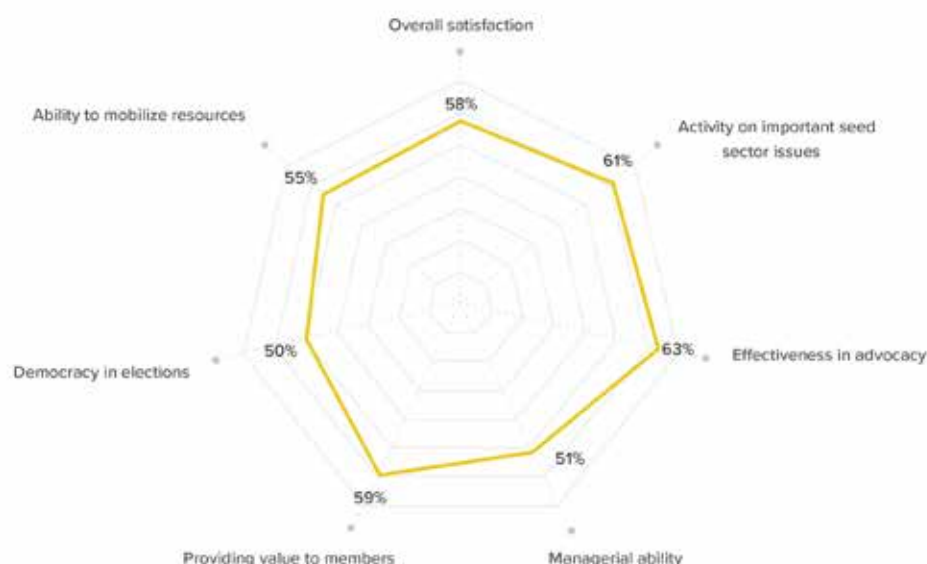
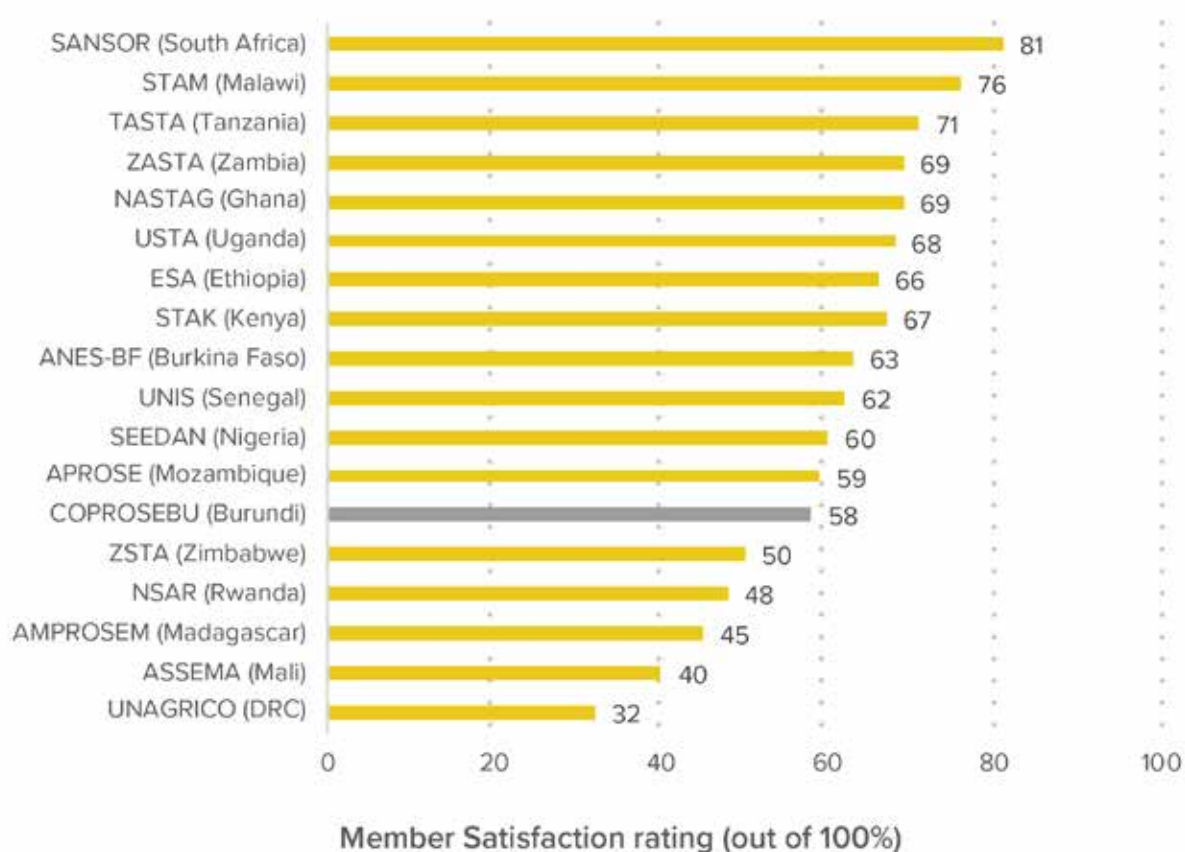




Figure 7: Performance of seed trade associations across Africa (study years range from 2016-2021)



ADEQUACY OF SEED INSPECTORS

Seed inspection services ensure that certified commercial seed meets the regulatory quality standards. To provide adequate inspection services requires sufficient numbers of well-resourced inspectors. TASAI studies track the number of inspectors and other information pertinent to their effectiveness, such as the availability of resources and the use of (new) digital tools.

Public seed inspectors in Burundi are employed by the ONCCS. Table 13 shows the number and rating of the adequacy of public inspectors. The number of public inspectors has increased from seven in 2018 to nine in 2020. In addition, the ONCCS trained and accredited 22 private seed inspectors in 2018, with the intention that these inspectors would complement the work of the public inspectors. In 2019, the accredited inspectors conducted seed inspection on 27% of the total seed areas while in 2020, they inspected 34% of the total seed area. Comparatively, the areas inspected by official inspectors decreased from 73% in 2019 to 66% in 2020 (PSSD, 2020). The process for accrediting private seed inspectors starts with the identification of candidates from among the existing agricultural extension officers. These officers are trained by the ONCCS, after which they receive a seed inspector accreditation certificate. A challenge that the ONCCS faces

is the lack of a laboratory to conduct seed tests and analysis and it currently uses a small seed laboratory owned by the Department of Plants and Seeds under MINEAGRIE. To be effective in conducting seed tests and analysis on a full-time basis, the ONCCS would need its own laboratory. In 2017, seed producers rated their satisfaction with the seed inspection services as “good” (73%).

Figure 8 shows the number of seed inspectors in the countries surveyed by TASAI. The number of public seed inspectors in Burundi is among the lowest in the countries surveyed. Only Rwanda (8), Sierra Leone (5) and Liberia (0) have fewer seed inspectors. Burundi is one of only five countries, among those surveyed by TASAI, to have private seed inspectors.

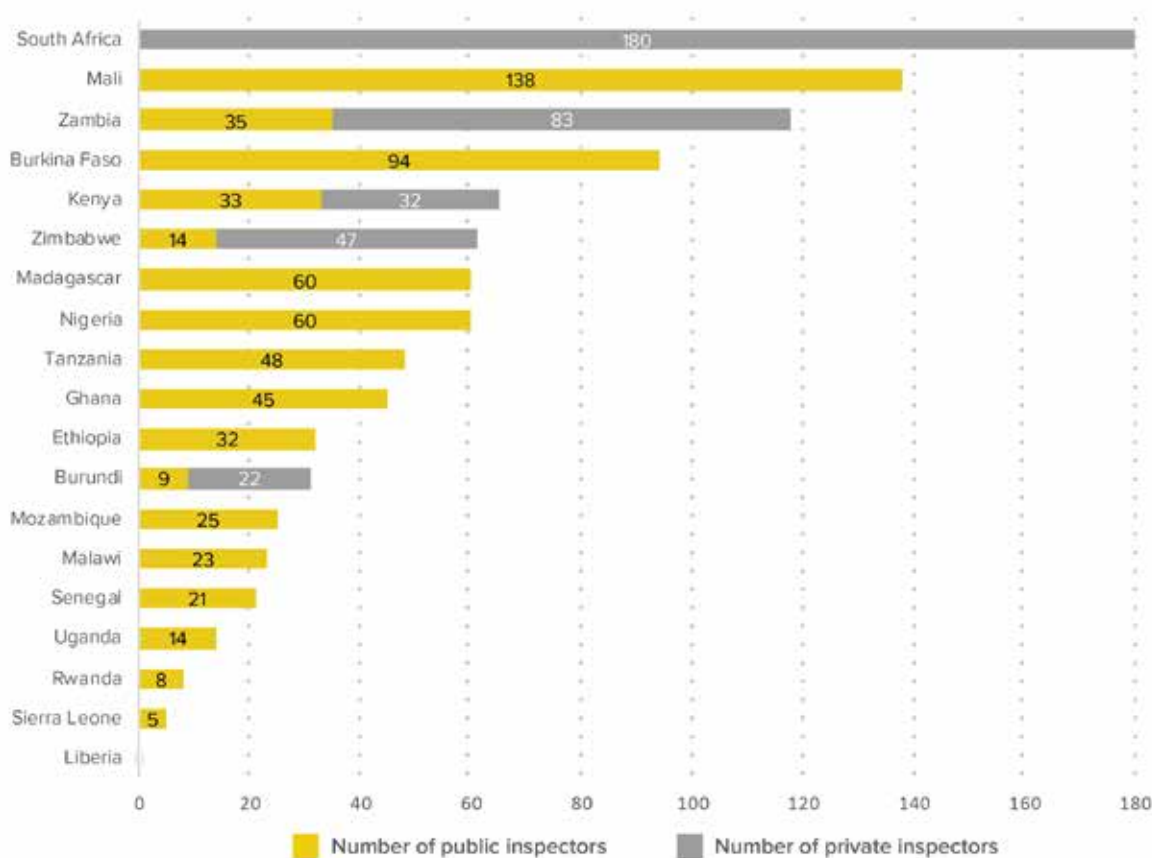
Table 13: Number and rating of the adequacy of public inspectors

Indicators	2018	2020
Number of public seed inspectors	7	9
Number of private seed inspectors	0	22
Seed industry satisfaction with ONCCS inspectors (out of 100%)	73%	-*

* No rating is available for 2021, as seed producers were not interviewed.



Figure 8: Number of seed inspectors in countries surveyed by TASAI (study years range from 2016-2021)



SERVICE TO SMALLHOLDER FARMERS

ADEQUACY OF EXTENSION SERVICES

Well-functioning agricultural extension services are critical to the successful adoption of improved seed by smallholder farmers. TASAI tracks the average number of agricultural households served by one extension officer. The lower this ratio, the better access farmers have to expert information and advice on how to access and use improved seed and other relevant agricultural technologies. This indicator tracks the number of extension officers by sector (public and private) and gender; it is not crop-specific.

Table 14 shows the number of extension workers and satisfaction with agricultural extension services in 2017 and 2020. The number of extension officers increased from 443 in 2017 to 1,030 in 2020 as a result of government efforts to ensure that each administrative unit (3,000 in total across the country) has at least one extension officer. Of the 1,030 extension officers operating in Burundi in 2020, 996 were employed by the government under MINEAGRIE’s Provincial Directorates of Agriculture and Livestock. These officers are often employed through various donor-funded programs. The remaining 34 are employed by seed producers. MINEAGRIE extension officers are organized at the provincial level (with at least four extension officers in each of the 17 provinces), at the commune level (with two extension officers – an agronomist and a veterinary officer in each commune), and at the zonal level (with two extension officers in each zone).

According to the Institute for Statistics and Economic Studies, there were 1,740,546 agricultural households in Burundi in 2017 (ISTEEBU, 2017). This translates to a ratio of one extension officer to 3,929 agricultural households. In 2017, seed producers rated their satisfaction with the extension services as “fair” (56%). There was no current data on the number of agricultural households in Burundi in 2020, so, for the purposes of the present study, we estimated the number of agricultural households using the country’s population, for which 2020 data was available. Accordingly, Burundi’s population grew by 9.8% during the 2017-2020 period (World Bank Data, 2021). Applying this

growth rate, we extrapolated the number of agricultural households in 2020 to be 1,911,120. This in turn gives a ratio of 1:1,855, a significant improvement from 2017.

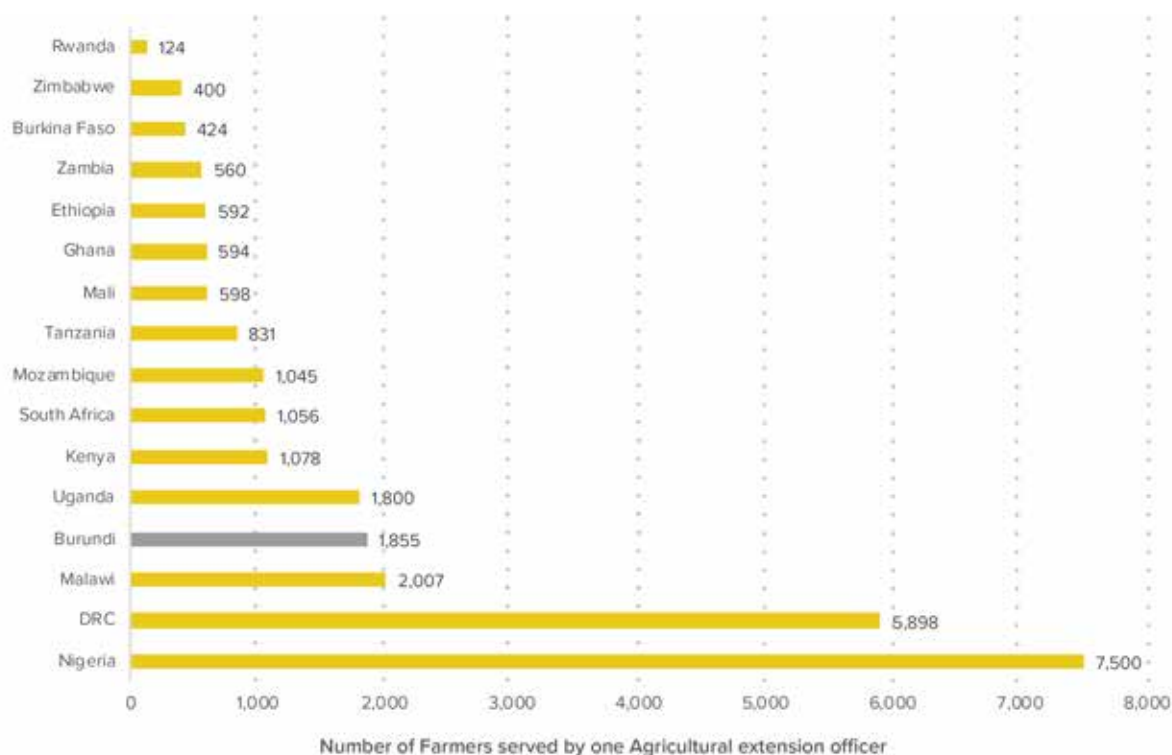
Figure 9 compares number of farmers served by one extension officer in countries where the TASAI study has been conducted. The ratio in Burundi is significantly higher than in most countries, indicating that Burundi farmers do not have good access to extension services, compared with their counterparts in other African countries.

Table 14: Number and adequacy of agricultural extension services

Indicators	2017	2020
Number of public extension officers employed by the government	443	996
Number of private extension officers employed by seed producers	29	34
Total number of extension officers	472	1,030
Ratio of public extension officers to agricultural households	1:3,929	1:1,855
Seed industry satisfaction with extension officers (out of 100%)	56%	-*
Interpretation of satisfaction	Fair	-

* No rating is available for 2021 as seed producers were not interviewed.

Figure 9: Comparison of number of farmers served by one extension officer (study years range from 2016-2021)





CONCENTRATION OF THE AGRO-DEALER NETWORK

Agro-dealers play a key role in Africa’s seed distribution systems, connecting seed growers to individual farmers, especially in hard-to-reach rural areas. They are often the main point of sale for certified seed. A higher concentration of agro-dealers means that smallholder farmers have greater access to improved seed. This indicator tracks the number of agro-dealers and, where possible, this is disaggregated between registered and non-registered agro-dealers.

Table 15 shows the number of agro-dealers and satisfaction with the agro-dealer network in 2017. In 2017, there were only 41 agro-dealers in Burundi. Only 10 of the 42 (24%) surveyed seed producers sold their seed through agro-dealers in 2017. On average, each of these seed producers worked with four agro-dealers, though half worked with only

one agro-dealer. The number of agro-dealers and the level of engagement between them and seed producers were both very low, a fact of some concern, given the important role agro-dealers play in supplying agricultural inputs to farmers. The number increased to 52 agro-dealers in 2020. However, a functioning system for the registration, training, and accreditation of agro-dealers does not exist. Using the updated (calculated) figure for the number of agricultural households in 2020, this translates to a ratio of one agro-dealer for every 36,752 agricultural households in 2020. The PSSD project has supported the establishment of 225 points of sale for seed in different municipalities across the country. Of these, 69 were set up in 2020 and 156 were set up in 2019.

The rating of the agro-dealer network given by seed producers in 2017 reflected the low number of agro-dealers: seed companies interviewed rated the agro-dealer network in Burundi as “poor” (35%) in 2017. No corresponding rating is available for 2020, as seed companies were not interviewed as part of the data update.

Table 15: Number and satisfaction of agro-dealers network

Indicator	2017	2020
Number of agro-dealers	41	52
Average number of agro-dealers per seed company	4	-
Ratio of agro-dealers to agricultural households	1:42,452	1:36,752
% of companies who sold seed through agro-dealers	24%	-*
Seed industry satisfaction with agro-dealer network (out of 100%)	35%	-*
Interpretation of satisfaction	Poor	-

* No rating was available for 2021 as seed producers were not interviewed.

AVAILABILITY OF SEED IN SMALL PACKAGES

Because most farmers in Sub-Saharan Africa operate on a small scale, making seed available in small, more affordable packages is a good way to increase adoption rates of improved seed. TASAI tracks the percentage of seed sold in different package sizes, i.e., 2 kg and below, 2-10 kg, 10-25 kg, and above 25 kg.

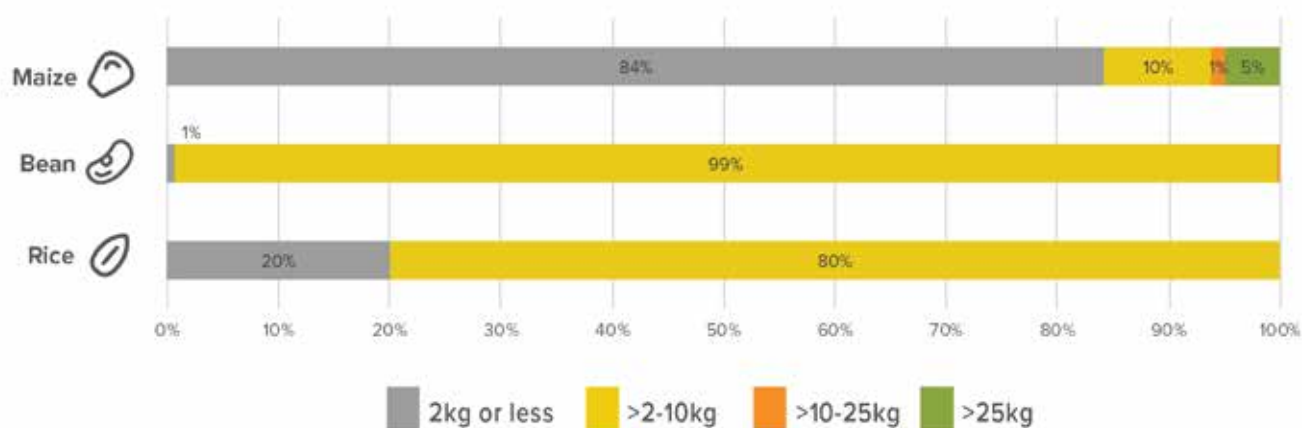
In 2017, most of the seed sold to farmers in Burundi was not packaged but was instead sold in sacks or bags. In most cases, a seed seller measures off the amount of seed a

farmer would like to buy. Broken down by crop, 15% of maize seed and 16% of rice seed was sold in packages; no wheat seed was sold in packages. The exception to this was bean seed, 95% of which was sold in packages in 2017. Figure 10 shows the percentage of seed sold in various package sizes in 2017. The percentage of small packages (2 kg or less) sold varied by crop in 2017: the bulk of packaged maize seed (84%) was sold in packages of 2 kg or less, primarily because much of this seed was imported and was already in small packages. In contrast, only 1% of packaged bean seed and 20% of packaged rice seed was sold in packages of 2 kg or less. For these crops, the most popular package size was 2-10 kg, used for 99% of bean seed and 80% of rice seed.





Figure 10: Percentage of seed sold in different package sizes (2017)



SEED-TO-GRAIN PRICE RATIO

The seed-to-grain price ratio at the time of planting is a good measure of the affordability of improved seed. This data point is important as many smallholder farmers end up making a choice between purchasing seed from the formal sector or planting grain. The greater the price difference between the two, the less likely that resource-poor farmers will purchase

certified seed. This indicator tracks the ratio of the retail price of seed (at the agro-dealer level) vis-à-vis the market price of grain at the time of planting.

Table 16 shows the seed-to-grain price ratios in 2017. In 2017, most of the OPV maize, bean, rice, and wheat seed cost US\$ 2 per kg, the price determined by the CNS. The price of hybrid maize seed was US\$ 3.2 per kg and was determined by the individual seed-importing companies.

Table 16: Seed-to-grain price ratios

Crop	Prices in 2017 (US\$/kg)		Seed-to-grain price ratio in 2017
	Average Seed price	Average grain price	
Maize (OPV)	2	0.82	2.4:1
Maize (hybrid)	3.2	0.82	3.9:1
Bean	2	1.16	1.7:1
Rice	2	1.09	1.8:1
Wheat	2	1.18	1.7:1

Source: Data for the four crops was sourced from RATIN 2017.



CONCLUSION

Burundi's seed industry is in the early stage of growth. Countries in this growth stage have some breeding programs and evolving seed policies. Startup seed companies produce and sell a limited range of staple crops to farmers who are early adopters. Both government and NGOs play a significant role in the seed sector (Ariga et al., 2019). For smallholder farmers, the informal seed sector is the main source of seed for key food crops and the volume of certified seed sales is low. Although Burundi's policy environment is supportive of seed sector growth and the data highlights several positive trends, substantial challenges remain that need to be addressed to ensure the growth of an enabling environment for the seed sector.

Under the **research and development** category, the study finds that the short length of the variety release process encourages breeders to develop and release varieties. However, ISABU, the only source of basic seed for most seed producers, lacks sufficient capacity to develop and release more varieties and to maintain the quality of existing varieties. To ease this bottleneck, ISABU should employ more breeders, collaborate with new private companies in the region that specialize in the production of basic seed, and strengthen existing collaboration with the CGIAR centers in the country. Since only 11 out of the 26 varieties released between 2018 and 2020 had climate-smart features, more effort should focus on developing new climate-smart varieties.

In the **industry competitiveness category**, we find that the formal seed sector is dominated by a small number of companies producing and marketing seed of the four focus crops. However, the recent entry of several foreign seed companies is encouraging, as it signals a growing investor interest in the country's seed sector.

When it comes to imports, the average length of the import process in Burundi is the longest among EAC countries. Since local capacity to produce seed is still developing, reducing the length of the seed import process will also enhance smallholder farmers' access to improved seed.

In terms of Burundi's **seed policy** environment, the country has a well-defined policy and regulatory environment, and the key policy instruments are up to date. However, the implementation of policy and regulations are lagging behind, as detailed in the next paragraph.

Institutional support for Burundi's seed sector continues to be weak. Of great urgency is the need to provide the ONCCS with sufficient funding to train and hire more public seed inspectors and deploy and routinely audit accredited private seed inspectors. In addition, the ONCCS requires its own laboratory facilities and equipment to ensure that all certified seed is tested and analyzed before it is marketed. The increased capacity will also allow ONCCS to counter the threat of counterfeit seeds more effectively. A note of improvement is that, since the 2017 study, COPROSEBU has registered several notable achievements in its member outreach, governance and management structures, and engagement with the government.

Service to smallholder farmers in Burundi remains weak, although some positive changes have been recorded. Most notable is the increase in the number of agricultural extension officers since 2017. Although the number continues to be low compared to other African countries, the increase in absolute numbers is still a positive development. As MINEAGRIE hires more extension officers, it should also work closely with NGOs and the private sector to ensure that extension staff are also adequately trained and equipped to reach farmers across the country.

Although the ratio of agro-dealers to agricultural households has improved slightly, Burundi continues to have a shortage of agro-dealers. As it seeks to increase the number of agro-dealers, MINEAGRIE should also develop a system to register, train, and accredit new and existing agro-dealers.

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ABOUT TASAI

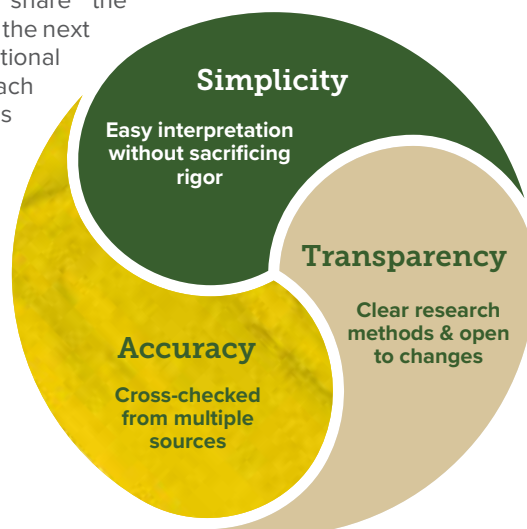


PILLARS OF COMPETITIVE SEED SECTORS

The African Seed Access Index (TASAI) is a seed industry research initiative that is coordinated by the nonprofit organization TASAI 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 African countries. The intended outcome of the index is improved access to locally adapted, affordable, and high-quality seed of improved varieties by smallholder farmers in Sub-Saharan Africa.

To assess the status of the seed industry value chain, TASAI tracks indicators in the following five categories: Research and Development, Industry Competitiveness, Policy and Regulations, Institutional Support and Service to Smallholder Farmers. By the end of 2021, TASAI studies will have been completed in 20 African countries: Burkina Faso, Burundi, 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. TASAI's approach is guided by the principles of Simplicity, Transparency, and Accuracy.

TASAI PRINCIPLES



Simplicity

Easy interpretation without sacrificing rigor

Transparency

Clear research methods & open to changes

Accuracy

Cross-checked from multiple sources

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

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