



UGANDA

Seed sector strategy & investment plan

October 2022 (Revised February 2023)



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Acronyms

AGRA	Alliance for a Green Revolution in Africa
CGIAR	Consultative Group on International Agricultural Research
COMESA	Common Market for Eastern and Southern Africa
EAC	East African Community
DCIS	Department of Crop Inspection Services
DAES	Directorate of Agricultural Extension Services
DUS	Distinctness, Uniformity and Stability
EGS	Early Generation Seed
IITA	International Institute of Tropical Agriculture
ISSD	Integrated Seed Sector Development
ISTA	International Seed Testing Association
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
MaRCCI	Makerere University Regional Center for Crop Improvement
NAADS	National Agricultural Advisory Services
NARO	National Agricultural Research Organization
NaCCRI	National Crops Resources Research Institute
NaSARRI	National Semi Arid Resources Research Institute
NHL	NARO Holdings Limited
NVRC	National Variety Release Committee
NSCS	National Seed Certification Service
PDM	Parish Development Model
PVP	Plant Variety Protection
PVoC	Pre-import Verification of Conformity to standards
QDS	Quality Declared Seed
STTS	Seed Tracking and Traceability System
SeedSAT	Seed Systems Assessment Tool
TASAI	The African Seed Access Index
USTA	Uganda Seed Trade Association
VCU	Value for Cultivation and Use

Executive Summary

The assessment of Uganda's seed system, conducted by the Alliance for a Green Revolution in Africa (AGRA), comprehensively identified key challenges and priorities in eight thematic areas: (1) breeding, variety release and maintenance; (2) early generation seed; (3) quality commercial seed production; (4) farmer awareness and participation; (5) seed markets and distribution; (6) policy, legal and regulatory frameworks; (7) quality assurance and (8) national planning and coordination.

These thematic areas are part of the Seed Systems Assessment Tool (SeedSAT) methodology and reflect the five strategic goals to which the government of Uganda has directed investments. Uganda hopes to achieve these strategic goals by 2023, as outlined in the National Seed Strategy. Consequently, in an attempt to close the identified gaps, it became necessary to conduct a mid-term review to assess the current achievements of the targets and devise modalities to improve on what does not work well.

With technical and financial support from AGRA and The African Seed Access Index (TASAI), the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) convened a meeting of various stakeholders in the seed industry in Uganda. The stakeholders interrogated the targets, reviewed the current achievements, and suggested further intervention areas. Details of the review and a resultant investment plan with its budget are explained in the respective sections of this write-up.

The document outlines seed industry targets that were set by the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) in the National Seed Strategy (2018-2023). The targets are for the percentage of certified/QDS seed that meets the annual requirement for that crop. The targets vary by crop from as low as 12% for groundnut and potato to as high 100% for hybrid maize and hybrid sorghum.

To achieve the seed production targets, the report further outlines seven other high-level targets that cut across the seed system. Four of these targets are directly related to seed quality assurance as this is a core priority for the seed sector in Uganda.

The total estimated cost of implementing these priority interventions is UGX 2,893,000,000 (Two Billion, Eight Hundred Ninety-Three Million Uganda Shillings), which equates to about USD 799,171 (Seven Hundred Ninety-Nine thousand, One Hundred Seventy-One US Dollars). Some of these costs are already borne by on-going interventions, in full or in part.

The components that require the highest investments are Quality Assurance (QA) and Quality Commercial Seed Production (QCSP). The high investment cost for QA pertain to strengthening the seed inspection function at NSCS, while the high costs for QCSP pertain to establishing seed laboratories for seed companies and building the capacity with USTA to support quality control efforts by seed companies.

In addition to undertaking new activities, there is a strong recommendation to build on existing projects and ongoing initiatives across the seed system. Some of these initiatives need to be scaled up to expand their coverage across the country or across different categories of seed actors. Other interventions need to be institutionalized and domiciled within different institutions.

Section 1:

Introduction

The National Seed Strategy (NSS) is a five-year framework which operationalizes the National Seed Policy (NSP 2018). It elaborates plans and actions to achieve the seed policy objectives. Systematically, a strategy explores the current situation in the seed sub-sector, provides the strategic direction, outlines the activities, presents a budget and describes the implementation arrangements. The mid-term review was conducted to evaluate what the current seed strategy planned to achieve, what it has achieved so far and what needs to be done to enable its successful completion.

The review was timely and in tandem with the aspirations of the government of Uganda through the current Agenda for Agro - Industrialization under the National Development Plan III and the Parish Development Model (PDM). The major objective of this Agenda and the first Pillar of the PDM is to increase production and productivity, under which quality seed production and regulation play a crucial role. Consequently, this constructive mid-term review aimed to obtain recommendations to boost quality seed production and trade within and outside of the Republic of Uganda.

In as much as proposals or interventions have been suggested, several barriers and risks stand in the way of improving the lives of poor people. They range from a misalignment of resources and intervention incompatibilities to a changing policy landscape. A new development agenda calls for a broader understanding of the sectors, development strategies and policies. It emphasizes learning and continuous feedback in all phases of the development cycle. Against this backdrop, MAAIF, in collaboration with AGRA and TASAI, brought together representatives from all levels of the seed value chain; namely researchers, seed producers, seed users, traders, policy makers and development partners. These representatives met to critically review, evaluate, and improve the quality, effectiveness, and efficiency of the seed policy and interventions at various stages of implementation.

Justification for the National Seed Strategy and Investment Plan

As part of a broader agenda of evidence-based policy making, the formulation of a National Seed Strategy and an Investment plan should be geared towards setting and tracking national and international targets. In effect, this will enable program managers enhance accountability, determine budget allocations and guide program design and policy decisions. While the strategy sets targets and design interventions, the investment plan identifies the intervention that is most cost-effective and capable of achieving the most desirable result. This justifies resource allocation in a country like Uganda, where the various Ministries compete with one another to obtain funding from the Ministry of Finance.

Like all other agricultural sub-sectors in the Ugandan economy and Africa at large, the seed industry is generally among the most risk-prone. Production shocks from weather, pests and diseases, unstable prices of inputs and products not only impact farmers and agri-business firms, but also strains government finances and other resources. Some of these risks are minor and could be managed by an individual value chain actor, but others result from more severe exogenous shocks outside of the agricultural sector, thus requiring a broader response from many actors. Failure to respond to severe risks leads to a vicious cycle of shocks-recovery-shocks which reinforces the poverty trap and impedes sustainable growth and development.

Vision and mission of the National Seed Strategy and Investment Plan

A healthy seed system is one in which farmers grow modern varieties of crops that have product profiles that are responsive to market and consumer demands and adaptable to their environments to ensure resilient and high yields. This system includes the following:

- A regular supply of domestically bred and imported crop varieties at a pace that matches market demand and gives farmers choices
- Healthy competition among public and private producers of the various stages of seed production to supply the market that are accountable for quality standards
- An appropriate blend of public and private engagement AND investment to ensure that early stage and food security crops that are not yet profitable are not neglected
- Seed subsidies (if used) are used carefully to temporarily bridge new market developments and market failures for short periods of time

This vision is reflected in the following objectives of the Uganda National Seed Policy:

- **Research and Variety Development: To generate new commercial and food security varieties**
- **Conservation of Plant Genetic Resources:**
 - › To sustainably utilize and protect Uganda's national plant genetic resources from destruction by natural and human activities and unauthorized access
 - › To promote the conservation of local varieties, indigenous knowledge, and practices through community genetic resource management

- **Seed Production and Conditioning:**
 - › To multiply and market high quality seed under the formal seed system
 - › To increase the availability of and access to quality seed of preferred varieties to complement those produced under the formal seed system
 - › To enhance the production of quality seed within the informal system
- **Seed Distribution and Marketing:**
 - › To increase the uptake of certified and Quality Declared Seed (QDS) by farmers
 - › To enhance Uganda's competitiveness in regional and international seed trade
- **Seed Quality Control:**
 - › To ensure quality control along the formal seed value chain
 - › To ensure quality control along the value chain for QDS
- **Seed Science and Knowledge**
 - › To develop human resource for the seed sector development
 - › To enhance participation by men, women and youth in seed marketing for QDS

Methodology:

The development of the seed sector strategy was preceded by several activities and steps.

Country SeedSAT assessment: The Seed Systems Assessment Tool (SeedSAT) is an assessment tool to collaboratively undertake in-depth country seed system analysis with governments and other stakeholders leading to improvements that increase the delivery and use of improved varieties of seed. The tool is intended to leverage, and not duplicate the information aggregated from existing resources and assessments, enhancing additional subject matter expertise to identify the root cause of deficiencies and inefficiencies as well as prioritizing seed system modifications and investments with a strong business case for raising internal and external funding. The 2020 TASAI Uganda report was an important reference for the SeedSAT assessment.

Stakeholder validation of SeedSAT country report: Following the completion of the assessments, the research teams (in collaboration with the government and AGRA country office) convened a workshop to validate the findings of the assessment. The stakeholders reviewed and critiqued the recommendations, priority interventions and proposed cost estimates. The Seed Sector Strategy and Investment Plan is informed by the results of the SeedSAT assessment, key existing industry documents, the current National Seed Strategy (2018-2023), and other industry documents.

The ambition for the agriculture sector in Uganda is outlined in the Agro-Industrialization component of the National Development Plan III. Under this component, the government's overall goal is to increase commercialisation and competitiveness of agricultural production and agro-processing. NDP III outlines seven target results under this component, four of which are outlined below as they have a direct bearing on the seed sub-sector. The target results, to be achieved over the next five years, are to:

1. Increase the total export value of processed agricultural commodities; coffee, tea, fish, dairy, meat, and maize (and its products) from; USD 0.935 Billion to USD 2.7 Billion.
2. Reduce the total value of imported cereals and cereal preparations, vegetable fats and oils, and sugar preparations from USD 931.1 million to USD 500 million.
3. Increase the agricultural sector growth rate from 3.8 percent to 6.0 percent.
4. Increase labour productivity in the agro-industrial value chain (value added, USD per worker) from USD 2,212 to USD 3,114.

High-level targets for the Seed Sub-Sector

The government targets for the agricultural sector outlined above are translated to targets for the seed sub-sector in the National Seed Strategy (2018-2023). The main target is to increase production of certified and quality declared seed for the key crops by 2025¹. The targets are outlined in Table 3 and were set by the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) in the National Seed Strategy (2018-2023). The targets are for the percentage of certified/QDS seed that meets the annual requirement for that crop. The crops that are highlighted include bean, cassava, groundnut, maize (open pollinated varieties and hybrid), potato, rice, sorghum (open pollinated varieties and hybrid), soybean and sweet potato. The crops are a combination of household food crops (like maize, bean, cassava, sweet potato), export crops (like maize, sorghum, soya bean) and agro-industrial crops (like maize, cassava, soya bean, sorghum).

The targets vary by crop from as low as 12% for groundnut and potato to as high 100% for hybrid maize and hybrid sorghum. Figure 3 shows the actual seed production by the end of 2021 against these targets.

¹ Seed also includes planting material for vegetatively-propagated crops like cassava, banana and sweet potato

Table 1: Seed production targets for 2025

Crop	Estimated annual seed use (in MT) ²	Seed production target in 2025 as percentage of annual seed use (%)		
		Certified seed (from seed companies)	QDS (from QDS producers)	Total (certified and QDS)
Bean	90,368	5%	15%	20%
Cassava	2,115,148	0%	15%	15%
Groundnut	36,234	2%	10%	12%
Maize (Hybrid)	10,000	100%	0%	100%
Maize (OPV)	15,655	40%	0% ³	40%
Potato	213,210	2%	10%	12%
Rice	8,064	40%	15%	55%
Sorghum (Hybrid)	1,069	100%	0%	100%
Sorghum (OPV)	6,059	20%	10%	30%
Soya bean	9,348	6%	10%	16%
Sweet potato	140,639	0%	15%	15%

To achieve the seed production targets outlined in Table 3, there is need to set other targets that cut across the seed system. Table 4 presents seven other high-level targets to be achieved by 2025. Four of these targets are directly related to seed quality assurance. This is because seed quality has been one of the key challenges in the seed industry in Uganda. According to the TASAI Uganda country report for 2022, seed companies' satisfaction with government efforts to address counterfeit seed has remained low, between 37% and 57% between 2015 and 2021. Therefore, it is critical that the seed production targets outlined in Table 3 are not met at the expense of seed quality.

Table 2: High-level Targets for National Seed Strategy and Investment Plan

Current situation in 2021/22	High-level target by 2025
NARO funding for development expenditure (i.e., research, breeding and variety development) is significantly inadequate	NARO able to consistently fund at least 75% of its development budget (research, breeding and variety development activities) through various sources
59% of the foundation seed (for 12 crops) pre-booked by seed companies in 2021B was supplied by NHL in 2022A	100% of foundation seed pre-booked by seed companies is supplied by NHL
77 NARO varieties being commercialized have been licensed to seed companies	100% of all NARO varieties being commercialized have been licensed to either seed companies or QDS producers
Basic seed is not certified by NSCS	100% of basic seed produced is certified by NSCS
Quality Management System for seed companies not yet developed	100% of seed companies adhere to industry-agreed internal seed quality control measures/ Quality Management System
National Seed laboratory at Kawanda is currently under renovation by the National Enterprise Corporation	National Seed Laboratory at Kawanda has received ISTA-accreditation for key seed testing services and is operational
High prevalence of fake seed on the market between 10% (millet) and 34% (maize), according to seed company estimates. ⁴	Prevalence of fake seed reduced to less than 5%

² Source: Uganda National Seed Strategy (2018-2023)

³ The Seed Strategy (2018) had set a QDS target for maize (OPV) at 10%. However, maize was not included as one of the Schedule 2 crops in the QDS Regulations of 2020. Therefore, the QDS target for maize has been excluded.

⁴ Source: TASAI (2022)

Section 2:

Background (status of agriculture and the seed sector in the country)

Agriculture is the mainstay of Uganda's economy, contributing 46% of the total export earnings and a large share of raw materials for agro-based industries. It employs approximately 65% of the total population. The agricultural sector performance is hampered by a number of challenges, including low levels of commercialization, poor linkages between research and farmers, low use of fertilizers, limited use of irrigation, land fragmentation, low levels of value addition, high financing costs, limited agricultural support machinery, pests and diseases, and poor transport mechanisms that affect distribution of inputs and evacuation of farm produce.

The top ten food crops in Uganda are maize, banana, cassava, groundnut, potatoes, common beans, sweet potato, soybean, sorghum and rice. Other crops commonly cultivated include sunflower, cowpea, pigeon pea, pineapple, millet, wheat, barley, cotton, tobacco, coffee, and tea, among others. Seed production of major food crops (maize, groundnut, bean, soybean, rice, millet, cowpea and sorghum) varies by crop and year, but is estimated at 35,000 tons per year. Maize contributes to approximately 50% of the total seed produced per year (NSCS 2021).

Table 3: Trend in quantities of certified seed under production

Crop	2020/2021	2019/2020	2018/2019	2017/2018	2016/2017	2015/2016
Maize	12,906.0	21,178.1	14,980.1	21,305.3	9,640.1	10,806.8
Beans	3,220.1	1,219.4	2,530.5	3,809.8	2,638.9	5,549.7
Sorghum	2,543.2	5,934.0	2,288.1	1,092.0	1,471.3	955.9
Assorted Vegetables	240.6	254.5	186.9	120.5	34.0	111.1
Soybean	1,004.5	833.4	504.5	395.1	111.1	435.6
Sunflower	205.3	223.0	230.9	609.2	82.8	278.0
Cowpea	1,434.5	6,305.3	3,766.4	6,365.6	377.4	969.2
Ground nuts	262.9	212.5	489.5	395.9	77.8	134.7
Rice	661.5	571.3	364.0	757.3	1,015.2	1,008.8
Sim-sim	233.5	752.3	220.5	111.1	136.0	107.7

Source: NSCS

Generally, the volume of seed certified by the National Seed Certification Service has increased since 2015/16 but with seasonal fluctuations in quantities (Figure 1). Maize seed contributes about 50% of the total seed certified, therefore any fluctuations in its production greatly affects the seed production trend. Uganda's farming system is rain-fed, so any extremes in weather conditions greatly affect the country's seed production and the seed sector at large. Moreover, a slight increase in the price of grain has a positive effect on seed demand and seed production. The reverse is also true.

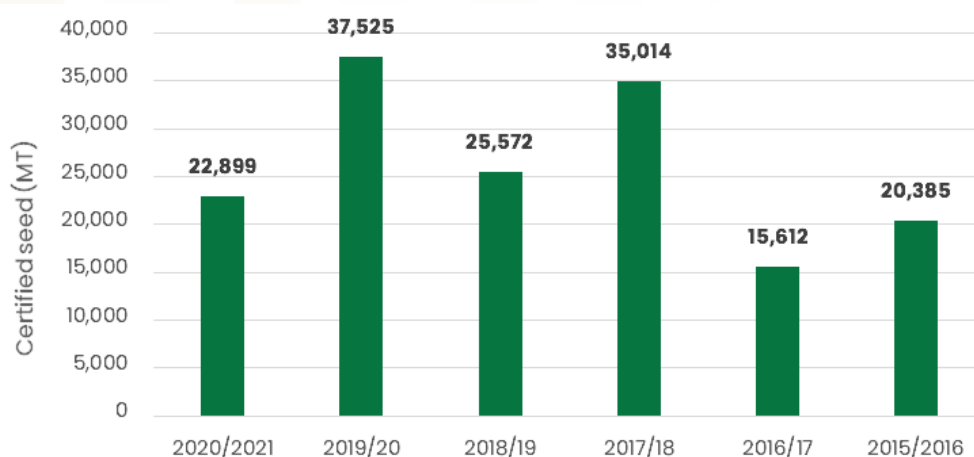


Figure 1: Certified seed tested at NSCS for the last six financial years in Uganda

Uganda has favorable conditions for seed production: two main cropping seasons; diverse agro-ecological zones; arable land and abundant water sources from lakes, rivers, and wetlands. This endowment provides an opportunity to increase seed production for the domestic and regional market. Uganda's seed sub-sector is characterized by co-existing formal and informal systems.

According to the National Seed Strategy (2015-2020), the contribution by the formal sector varies widely by crop; from a high of 59% for maize and 54% of sorghum, to a low of 13% for millet. There are over 35 registered seed companies producing an estimated 35,000 MT of seed, of which about 60% is maize seed. The National Seed Certification Services (NSCS) is mandated to regulate the formal seed system through variety listing and final seed certification. However, inadequate capacity (including human and financial resources) hampers the ability of NSCS to sufficiently monitor field production and seed conditioning for quality control. The formal seed system needs to be strengthened to enhance its production capacity and competitiveness in the local, regional and international seed markets. On the other hand, about 85% of seed planted is obtained from informal sources, mainly farm-saved seed, local markets, and social networks. As a result, the seed that most of the farmers in Uganda use is of debatable quality. In an effort to modernize the country's agriculture, the government realizes the need to significantly increase the quantity of quality seeds available to farmers.

Summary of existing initiatives and investments in the seed sector in the country

There are several on-going initiatives related to seed sector development in Uganda. These initiatives include projects or specific investments that are funded and/or implemented by the public sector, private sector, research institutions, development partners or non-governmental organizations. The documentation of these initiatives is intended to avoid any duplication when new projects or interventions are being planned and to ensure coherence and learning from existing engagements. Thus, the interventions listed in Table 2 below may not be altogether exhaustive.

Table 4: Existing initiatives and investments in the seed sector in Uganda

Name of intervention/ activity	Name of responsible organization	Description of intervention
Seed Tracking and Traceability System (STTS)	National Seed Certification Service (NSCS)	The STTS aims to digitize the following seed services: registration of seed actors (e.g., seed companies, QDS producers, seed sellers); submission of planting returns; application for field inspection; uploads of seed inspection reports; application for seed import/export permits; request for collection of seed samples; application of seed samples, etc. The intention is for all the seed in the industry to go through the STTS.
Makerere University Regional Center for Crop Improvement (MaRCCI)	Makerere University	MaRCCI is an African Regional Center of Excellence for Plant Breeding training hosted at the College of Agricultural and Environmental Sciences (CAES). The purpose of the Center is to provide support in the delivery of high-quality training in plant breeding, seed systems, and biotechnology.
NARO Guidelines for Intellectual Property Management	NARO Intellectual Property Office	NARO implements Guidelines for Intellectual Property Management which give seed companies and QDS producers access to NARO varieties on an exclusive or non-exclusive rights basis through licensing agreements.
NARO system for pre-booking basic seed	NARO Holdings Ltd and NARO	The system applies to pre-booking basic seed 6 months in advance of delivery. This is intended to improve the clarity, efficiency and predictability in the supply of basic seed to seed companies and QDS producers. In addition, the system would enable NARO to estimate the demand for basic seed a season in advance. The system is coordinated by NARO Holdings and overseen by the EGS working group under NARO.
Renovation of national seed laboratory	MAAIF (ACDP/ World Bank support)	The national seed laboratory at Kawanda is being renovated under the Agriculture Cluster Development Program (ACDP). The aim of the renovation is to attain ISTA accreditation
Training and deployment of para seed inspectors	Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), AGRA	104 para seed inspectors were identified from the agricultural extension workforce and trained in seed inspection. They will be available for deployment for field inspections as and when needed. AGRA is supporting the procurement of 50 motorcycles to be used by the para inspectors.
Gazettement of the PVP regulations	USAID Seed commercialization activity	USAID has supported the engagement meetings towards the gazettement of the PVP regulations and establishment of the PVP office. This project is on-going.
Agricultural Value Chain Project	MAAIF and NARO	The Agricultural Value Chain Project aims to improve access to quality seed and other inputs, targets, maize, rice and pastures. Funded by GoU and AfDB, the project is on-going.
VegSeed	NARO and MAAIF	VegSeed aims to strengthen assorted vegetable seed value chain, variety development, seed production and release. This project is just beginning.

Section 3:

High-level Targets and Priority Interventions

Section 4:

Mid-Term Review of the National Seed Sector Strategy

The National Seed Sector Strategy (2018/19 to 2022/23) was published in October 2018. The objective of the strategy was to develop a pluralistic, competitive and vibrant seed system that would contribute to increased agricultural productivity and development. This section presents a mid-term review of the progress made with implementation of the strategy. The review was coordinated by the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) with support from TASAI. The information on the performance was sourced from several key institutions, including the National Agricultural Research Organization (NARO) and the Uganda Seed Trade Association (USTA). Further, MAAIF, AGRA and TASAI convened a seed sector stakeholders' workshop on the 23rd and 24th August, 2022 in Kampala to share the preliminary findings of the review. The stakeholders provided additional input and comments which have been incorporated into the review.

The National Seed Sector Strategy was Implemented in five components: (1) Research and Development; (2) Seed Uptake; (3) Seed Distribution and Marketing; (4) Seed Quality Control; and (5) Seed Knowledge and Science. The report presents targets and achievements under each component. Figure 2 presents an overall summary of the performance, across the different targets, by counting the number of the targets that have been achieved, are in progress, or with no progress at all.⁵ The detailed breakdown of the performance of each target is shown in Table 3.

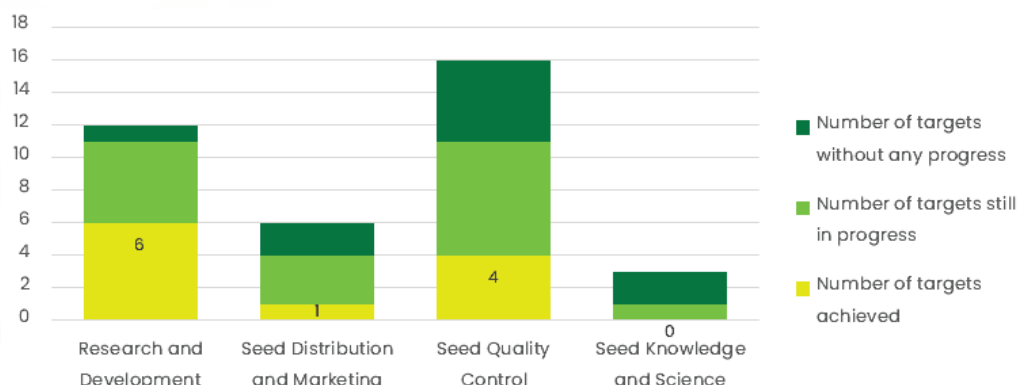


Figure 2: Summary of progress of implementation of National Seed Sector Strategy

Figure 3 shows the performance under the component on Seed Uptake and Use. This component focuses on the volumes of certified and QDS seed produced. The graph compares the actual production of certified seed in 2021 against the targeted production in 2023.

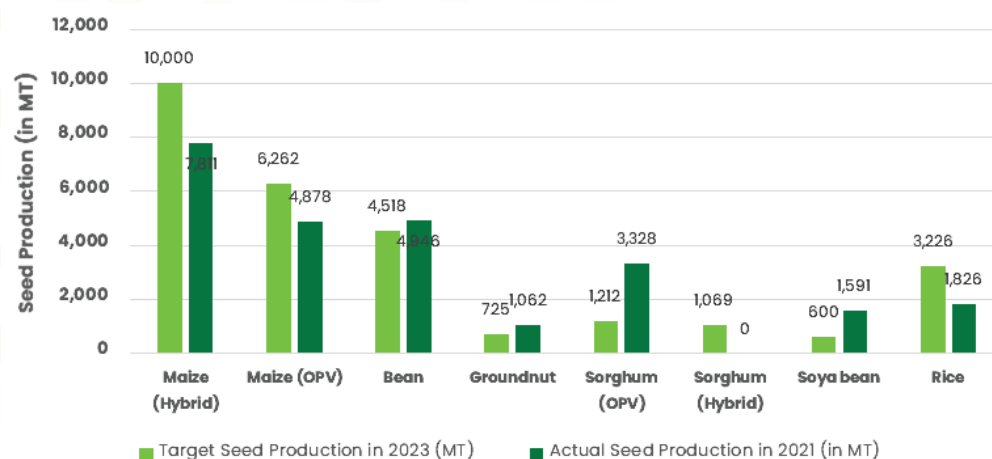


Figure 3: Seed production targets for 2023 vs actual seed production in 2021 (Certified Seed)

⁵ The chart only shows the progress for four of the five components. The 5th component is shown in Figure 2.

Actual production of certified seed for bean, sorghum (OPV), groundnut and soybean in 2021 exceeded the target for 2023. The target is close to being met for maize (OPV). However, MAAIF has noted that there are significant inadequacies in data collection and data management on seed production. The data on actual seed production was sourced from both NSCS and USTA – with the former acknowledging that there are shortfalls in data collection efforts.

Figure 4 compares the actual production of Quality Declared Seed in 2019 and 2021 against the targeted production in 2023. The data is only shown for three crops – bean, soybean, and sesame. This is because NSCS has not been able to collect data for the other crops under QDS production. For the three crops, the actual production falls significantly short of the targeted production. This is especially true for bean seed. The target seed production for this crop in 2023 was 18,074 MT. However, only 268MT of QDS bean seed was produced in 2021. It is important to note that there was a decline in QDS production of bean seed and sesame seed between 2019 and 2021.

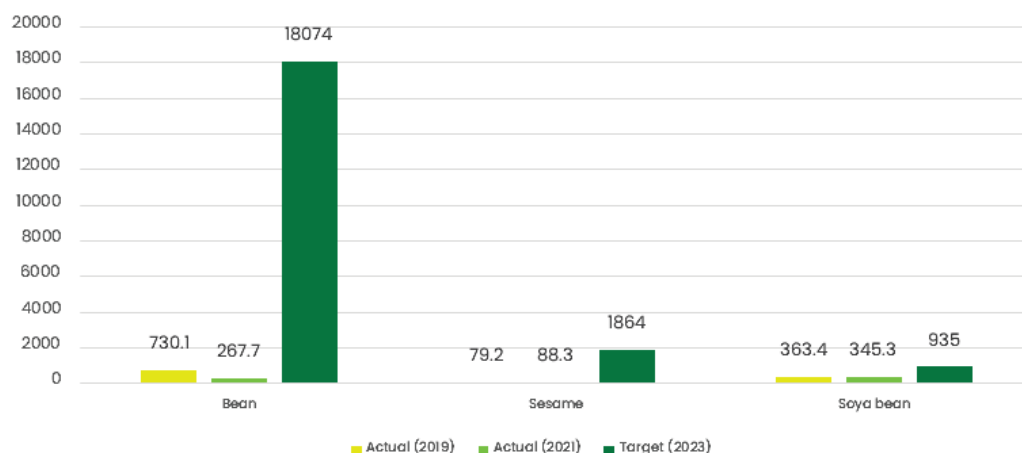


Figure 4: Seed Production targets for 2023 vs actual seed production in 2021 & 2019 (QDS)

Table 3 provides a detailed report on the performance of the implementation of the National Seed Strategy. The table provides a color code against each target to indicate if the target has been achieved (green), is in progress (orange) or if no progress has been made (red).

Table 5: Breakdown of targets and performance by Component

Research and Development-- Targets for 2023	Actuals (2022)	Score
NARO licenses seed production of its varieties for 12 crops.	13 seed companies have been awarded licenses to commercialize 77 NARO varieties.	
Farmers access NARO adaptability trials twice a year.	NARO works with farmers to showcase newly developed varieties.	
All NARO breeding programs strengthened with personnel and laboratories.	NARO breeding programs are under-funded.	
Participatory Plant Breeding (PPB) is included in NARO plant breeding strategies.	NARO breeding plan has developed with product profiles that include input from stakeholders.	
Agricultural fairs are available at each agro-ecological Zone.	Agricultural fairs/shows conducted by Uganda National Farmers' Federation (UNFFE) and New Vision Group are national and not by agro-ecological zone. UNFFE has been planning regional shows for the last two years. The first regional show is planned for October 2022 in West Nile.	
10 food security crops are listed as next priorities for NARO breeding programs.	Priority crops have been integrated and guided by the NARO breeding plan.	
3 Private companies have breeding programs.	Only one of the locally owned seed companies has its own breeding programs. However, the multinational/regional companies have breeding programs that are located in other countries.	
PVP Act is implemented.	PVP Act has been passed, but the PVP Regulations have been reviewed. MAAIF/NARO has responded to the comments from the Solicitor General.	
MoU is signed by NARO and CSO to promote new varieties of crops in areas.	NARO engages CBOs, farmer groups and civil society through MoUs and contracts to promote new varieties through demonstrations, among other avenues.	
10 Seed Crop production manuals are published by NARO.	NARO crop production manuals/guides are available for 2 crop – sorghum and groundnut.	

55 technology packs are available with information to Seed Farmer groups.	NARO Technology Compendium (2018-2022) has information on 9 varieties for five crops – banana, bean, maize, rice and groundnut.	
1 international forum in Plant Breeding is organized in Uganda.	Excellence in Breeding was held in 2019 and training in breeding optimization and breeding operations were held in February 2022.	
Seed Knowledge and Science – Targets for 2023	Actuals (2022)	2023
MAAIF police in collaboration with local police enforce seed market regulations.	The MAAIF police are available for work. However, their operations are constrained due to poor funding.	
Prevalence of fake seed is under 5%.	Seed companies estimate that between 10% (millet) and 34% (maize) of certified seed on the market is counterfeit (Source: TASAI, 2022).	
5,000 villages have a seed agent.	623 agro-dealers registered by NSCS/MAAIF by May 2022. The registered agro-dealers have been trained by College of Agriculture and Environmental Sciences, Makerere University. However, MAAIF estimates that there are more than 3,000 active agro-dealers across the country.	
450 LSBs are operating as seed dealers.	ISSD established about 250 LSBs. However, on the one hand, many of these are not active as they were reliant on external support from ISSD Uganda. On the other hand, several other LSBs have been formed through support from USAID and World Vision.	
100 annual Seed Fairs are held.	This is not done.	
Quality controlled seeds are widely available in small packages (down to 1 kg).	The percentage of certified seed sold in small packages (2kg or less) by seed companies in 2021 was 53% (for maize), 28% (for bean), 54% (for millet), 20% (for sorghum) (Source: TASAI, 2022).	
Seed Knowledge and Science – Targets for 2023	Actuals (2022)	2023
Complete Quality Management System (QMS) is implemented at NSCS, including accounting and budgeting procedures for self-funding.	This is in progress with support from COICA.	
A new QDS quality assurance system allows Seed Quality Control and Certification (SQCC) for crops and varieties where classes are not competitive.	QDS Regulations passed in 2020. They include field inspection standards for 15 crops.	
Seed regulations are harmonized with COMESA for Seed Standards and Common Catalogues.	National seed standards are harmonized with COMESA Seed standards, and COMESA varieties are accepted onto the Uganda Variety List.	
Seed regulations are harmonized with EAC for Seed Standards and Common Catalogues.	EAC Seed Bill is yet to be passed by the East African Legislative Assembly (EALA).	
NSCS Standard procedures for all Seed Quality Control and Certification (SQCC) operations are approved by NSB.	Procedures have been developed but require periodic review.	
NSCS regularly conducts DUS testing and control plots.	This is available for some crops.	
Clear and written standard procedures are approved by the National Seed Board (NSB) for all operations related to Seed Quality Control and Certification (SQCC).	Procedures have not been developed.	
Procedures for registration in the National List of traditional varieties are in place, including DUS requirements.	Procedures for DUS are available.	
23 seed companies are with internal Quality Management System (QMS).	About 35 seed companies are with internal QMS.	
National Seed Laboratory is accredited by the International Seed Testing Association (ISTA).	ISTA accreditation is still in process.	
20 official seed inspectors	NSCS has eight seed inspectors 2022 but co-opt another 10 within DCIC.	
30 authorized inspectors	No authorized seed inspectors	
20 authorized seed analysts	No authorized seed analysts	

11 accredited bodies for Seed Quality Control and Certification (SQCC)	No accredited bodies for SQCC	
10 accredited laboratories	No accredited laboratories. Makerere University is establishing a seed laboratory, but this will mainly be for training purposes.	
Uganda Seed Sector Information Management System (USSIMS) is in place.	USSIMS is not in place. Seed tracking and tracing is being rolled out.	
Seed Knowledge and Science – Targets for 2023	Actuals (2022)	2023
National Seed Board knowledge sharing platform is hosted at USSIMS.	A knowledge repository is within STTIS.	
Three tertiary institutions offer seed technology grades.	Makerere university offers a Master’s and PhD degree course on Plant Breeding and Seed Systems. There is a degree course on Seed Technology.	
Three tertiary institutions receive technical assistance for seed related education.	None.	

Section 4:

High-level Priority Interventions

To achieve the high-level targets the following nine (9) priority interventions are proposed. These interventions are to be implemented across the seed system and by various seed industry stakeholders including government agencies, private sector and national agricultural research centres. The total estimated cost of implementing these priority interventions is UGX 2,893,000,000 (Two Billion, Eight Hundred Ninety-Three Million Uganda Shillings), which equates to about USD 799,171 (Seven Hundred Ninety-Nine thousand, One Hundred Seventy-One US Dollars). Some of these costs are already borne by on-going interventions, in full or in part.

1. **Implement the National Agricultural Research Organization (NARO) framework to streamline production and supply of EGS.** NARO has established a pre-ordering system through which seed companies and local seed businesses can access EGS for certified and quality declared seed, respectively. The system is implemented through NARO Holdings Limited and is intended to improve the forecasting, planning and production of basic seed in response to effective demand from seed companies and Quality Declared Seed (QDS) producers. However, the system is facing various challenges including high down-payments, late orders from seed companies, and insufficient awareness or understanding of the system by companies and QDS producers. The implementation entails the following activities:
 - a. Clear elaboration and wide circulation of the framework among all NARO institutes (including the Zonal Agricultural Research and Development Institutes (ZARDIs)), seed companies, and QDS producers to ensure that they are fully understood.
 - b. Continual two-way dialogue between NARO and the seed companies and QDS producers to address the current and emerging challenges with the framework. Further, if all the seed companies and QDS producers adhered to the system, it would allow NARO to forecast the demand for basic seed seasonally.
2. **Implement the Licensing Agreements between seed producers and NARO.** NARO has developed Guidelines for Intellectual Property in 2018 to allow for the access and licensing of varieties to seed companies and QDS producers. These guidelines are partly being implemented through Licensing Agreements between breeders and seed companies. The agreements ensure that breeders receive a percentage of the revenue from sales of their developed varieties. Between September and December 2021, 13 seed companies signed Licensing Agreements with breeders. The full implementation of the guidelines would facilitate the commercialization of NARO varieties to farmers through seed companies and QDS producers. The implementation of the guidelines will need to be closely monitored under the EGS working group to ensure that the intended objectives are realized, and emerging challenges are addressed.
3. **Implement NHL's business plan. NARO Holdings Ltd (NHL) is the business arm of NARO and its objective is to commercialize NARO technologies including crop varieties.** NHL's activities include the production, processing and marketing of basic seed to seed companies and QDS producers. In support of this main function, NHL has access to land, processing facilities and storage facilities for basic seed. Further, NHL undertakes activities aimed at raising farmer awareness of NARO varieties. To fulfil this mandate, there is a need for NHL to be supported. In addition, there is a need to enhance the collaboration between NHL and seed companies as well as QDS producers.
4. **Develop and then implement a roadmap leading to basic seed certification.** Basic seed in Uganda is currently not certified as it does not go through the seed certification process under the National Seed Certification Service (NSCS). However, with interventions to streamline and professionalize the production and sale of basic seed from NARO to seed companies and QDS, there is a need to ensure that basic seed is certified before it is sold to farmers. NARO and other basic seed producers would need to work closely with NSCS to develop a roadmap leading to the certification of basic seed.
5. **Strengthen the seed quality control capacities and measures within seed companies and QDS producers.** The Seed and Plant Regulations of 2017 outline the requirements for the registration of seed companies (or seed merchants) in Uganda in terms of human resources and infrastructure. These requirements are intended to ensure that all registered seed companies produce quality commercial seed in line with national, regional and international standards (where applicable). This would entail the following activities:
 - a. The NSCS, in collaboration with the Uganda Seed Trade Association (USTA) and NARS, should develop a comprehensive set of registration requirements and protocols for seed companies. The requirements/protocols should include staffing requirements (such as seed technologists), protocols for quality seed production, and protocols for seed processing, among others.
 - b. The NSCS and USTA should conduct annual audits of each seed company. When gaps are identified in a company, a plan should be put in place to address them within a given timeline. This approach should also be applied to QDS producers under their respective Local Seed Business (LSB) associations.
 - c. Seed companies should establish their own seed laboratories. Some companies have already expressed an interest in such investments.

6. **Evaluate the early performance of the Seed Tracking and Traceability System (STTS) & then roll-out the STTS to other industry actors.** NSCS should come up with a comprehensive workplan for the implementation of the STTS, establish infrastructure for the rollout, and organise a quick recap training on STTS technical applications for key seed stakeholders. The National Seed Certification Service has recently started using a Seed Tracking and Traceability System to track the movement of seed from the breeders to the agro dealers. NSCS, in collaboration with the Uganda Seed Trade Association (USTA) and other actors, should jointly evaluate the initial performance of this tool. This evaluation should (i) identify any emerging bottlenecks and define strategies to address them, (ii) assess the extent to which the digitization of the system enhances the efficiency of its implementation, and (iii) identify any challenges pertaining to the adoption of the system by all the actors.
7. **Increase the capacity of USTA to provide oversight on internal quality control systems within seed companies.** In 2021, USTA hired a quality control officer to work with seed companies to strengthen their internal quality control systems. This is a positive step and needs to be strengthened by: (i) establishing protocols and standards against which seed company performance should be benchmarked; and (ii) assessing whether a second quality control officer is needed to undertake this task.
8. **Strengthen NSCS seed inspection service capacity to provide quality assurance services adequately and effectively to the industry.** The intervention would enhance NSCS capacity to conduct surveillance at the seed company and seed retail levels, in collaboration with USTA and the Uganda Police. The specific activities would include:
 - a. Conducting a needs assessment for effective field-based Quality Assurance activities. That is, what human resource and logistical capacities are needed for effective seed certification services. An expert would need to be hired for this activity.
 - b. Fund the NSCS to implement the findings of these assessments. The funding may include hiring additional seed inspectors and purchasing vehicles/motorcycles for the seed inspectors.
 - c. Develop program for training and then monitoring the performance of para seed inspectors.
9. **Establish an ISTA-accredited seed laboratory.** NSCS needs to fast track the renovation of the laboratory to aid the accreditation process to ISTA standards to serve as a valid reference laboratory and issue export certificates. To do this NSCS should:
 - a. Bring in appropriate technical advice to advise on the next steps and investment required to complete the infrastructure works and hire the requisite technical capacity
 - b. Procure the necessary equipment for the laboratory and invest in the capacity building (trainings and refresher courses) of the lab technicians and inspectors to support the effective functioning of the lab and be up to date with evolving technologies.

Investment requirement for priority interventions

There are already on-going investments and interventions for some of these activities. However, the estimated cost required to fully implement the nine interventions is UGX 2,893,000,000 (Two Billion, Eight Hundred Ninety-Three Million Uganda Shillings), which equates to about USD 799,171 (Seven Hundred Ninety-Nine thousand, One Hundred Seventy-One US Dollars). The breakdown of the costs and other details is contained in Table 5 below. Of the total investment, a substantive amount is to be covered by the private sector, especially, the seed companies and NARO Holdings Limited (NHL). This includes an estimated UGX 630,000,000 for the establishment of mini seed laboratories for three seed companies. Further, other private sector investments are noted as “unspecified” in the table and include the implementation of NHL’s business plan, implementing the framework to streamline EGS supply to seed companies and supporting additional seed quality control staff at USTA.

Table 6: Breakdown of Investment required for Priority Interventions

Intervention	Description	Estimated cost (UGX)	On-going/ planned investment (UGX)
Implement NARO framework to streamline production and supply of EGS.	This is on-going work by NARO. The additional activities include meetings between NARO, NHL, seed companies and QDS producers to address bottlenecks related to the implementation of the framework	50,000,000	Unspecified private sector contribution
Implement the Licensing Agreements between seed producers and NARO.	This is on-going work by NARO. The investment would be to intensify the activities namely: meetings between NARO with seed companies and QDS producers; and following up the implementation of the licensing agreements	50,000,000	-
Implement NHL’s business plan	NHL has a business plan that aims to increase the commercialization of NARO technologies, by working closely with seed companies and QDS producers, marketing NARO varieties, expanding production by opening up land at NARO institutes to seed production, fully utilizing the seed processing facilities. These costs are all to be borne by NHL.	0	Unspecified private sector contribution

Develop and then implement a roadmap leading to basic seed certification.	The intervention entails meetings between NSCS and producers of basic seed including NARO, universities such as Makerere University and Uganda Christian University, and seed companies to define the standards and the approach to certification of basic seed under the Second Schedule in the Seed Regulations	50,000,000	-
Strengthen the seed quality control capacities and measures within seed companies and QDS producers	At least three seed companies plan to establish their own mini seed laboratories. Costs would include conducting feasibility studies, developing procurement plans, infrastructure works and purchase and installation of equipment. The estimated cost per laboratory is UGX 200,000,000	630,000,000	630,000,000
Evaluate the early performance of the Seed Tracking and Traceability System (STTS) & then roll-out the STTS to other industry actors.	The STTS is an on-going activity by NSCS. The conduct of an independent evaluation to assess the performance of the STTS initiative would be an additional activity by an independent entity. Thereafter, convene validation meeting to discuss findings of the evaluation	35,000,000	-
	Train agro-dealers and breeders to use the STTS. This is an on-going activity by NSCS. The additional costs are to cover field costs and training costs across the country.	50,000,000	-
Increase the capacity of USTA to provide oversight on internal quality control systems within seed companies.	Develop protocols and guidelines to assess the quality control capacities of seed companies. This entails hiring a seed expert to work with USTA, seed companies and NSCS to develop the protocols, and convening meetings with these entities to discuss and validate the protocols before they are adopted. All seed companies should be required to participate in this exercise.	40,000,000	-
	Hire at least one additional seed quality control officer. Costs include salary for two years and field costs (such as transport costs and communication costs)	288,000,000	Unspecified private sector/ USTA contribution
Strengthen NSCS seed inspection service capacity	Develop and implement program for monitoring performance of para inspectors. Costs include meeting costs. Hiring an expert to work with NSCS & para inspectors to develop program.	30,000,000	-
	Hiring additional 10 seed inspectors and paying salary for 3 years. Estimated annual salary of UGX 51,000,000 for Senior Officer, under government Civil Service Salary Structure	1,530,000,000	-
	Procurement of two vehicles for seed inspectors. Two vehicles at UGX 60,000,000 and maintenance costs	140,000,000	-
Establish ISTA accredited seed laboratory	This is on-going work with the National Enterprise Corporation financed by the government.	0	Unspecified government financing to on-going work
TOTAL		2,863,000,000	

Section 5:

Analysis of Seed Sector Challenges and Priority Interventions

This section presents a discussion on challenges and key priorities for intervention under each of the eight components. Note that the interventions outlined in this section also include the high-level priorities explained in Section 4.

Component 1: Breeding, Variety Release and Maintenance (BVRM)

The key metric for the success of a breeding program is the rate of genetic gain it delivers in farmers' fields. Investments in public breeding programs can only be justified if there is genetic gain over time. Thus, there is a need to embark on system changes that would improve the ability of the research system to generate and deliver products efficiently. The main institutions involved in agricultural research and breeding of the main staple crops are the National Agricultural Research Organization (NARO) and its institutes, NaCCRI and NaSARRI and Makerere University.

Key challenges and gaps in National Agricultural Research and Breeding Effectiveness

- Limited capacity of NSCS to conduct variety evaluation tests:** The Seeds and Plant Act and Regulations enable the NSCS to conduct variety evaluation tests of DUS and NPT for a prescribed fee. However, NSCS does not conduct these evaluation tests due to limited capacity. NARO conducts the tests on behalf of NSCS, while NSCS monitors the process. The evaluation costs are much higher than the official fees, since NSCS does not conduct the tests. In addition, there is a conflict of interest when NARO conducts these tests since it is also a breeder and competitor in the market.

Priorities for intervention

- Develop a business case and prioritize investments to ensure research programs are supported with suitable infrastructure.** The infrastructure (e.g., laboratory, greenhouse, seed storage, etc.) would facilitate their research activities. The effectiveness of the breeding programs is severely constrained by make-shift seed storage units, non-functional lab equipment, and poor irrigation facilities and greenhouses. Well-designed, purpose-built facilities contribute to quality and efficiency of work. With proactive equipment maintenance schedules and a continuous back-up power supply, most equipment could last a long time. There is an urgent need to develop greenhouse and field capacity to screen traits relevant to growers and consumers. In addition, an effective crop improvement program requires adequate seed storage facilities, laboratories, and irrigation facilities. These include short term cold storage large enough to at least maintain supplies of elite parental lines for 2 to 3 years.
- Develop a funding strategy to meet goals for variety development, release and maintenance of germplasm.** The government is the main funder of the national agricultural research institutions. However, government support is minimal and mostly geared towards paying salaries. Operational expenses are covered through external funding. The NARO research programs need to develop a comprehensive funding strategy outlining the current and potential sources of funding and the specific steps to access the funding from these sources. This strategy would need to be monitored to assess its effectiveness. Potential sources of funding include external competitive grants, royalty payments from the licensing of varieties and other research services. In addition, there is a need to balance out the proportion spent on salaries with operational costs through better financial planning and tracking of costs. Finally, the strategy should also include a cost reduction strategy. This is needed to take stock of the most expensive operations and to determine if they could be either mechanized or minimized. For example, what is the current cost per row per plot? What are the key data that need to be collected in preliminary trials? The idea is to question current practices and arrive at alternative and less expensive ways of operating.
- Design a breeding program based on clear definitions of product profiles and target crop growing environments with a focus on delivering realized genetic gain to farmers.** Breeding programs include activities, from trait integration through testing of advanced products in wide area trials, up to the release of products in the marketplace. The size and organization of the breeding program limits delivery of realized genetic gain. It is necessary to introduce an effective organization for breeding, variety release and maintenance by optimizing research activities with available resources. Developing well-defined, prioritized and market survey-based product profiles would guide the breeding program by defining market segments and priority constraints based on sufficient understanding of target markets and production systems. To support the development of product profiles, there is a need to constitute a group of cross-functional, technical team members (a breeding team) and to engage social scientists, economists and others who will design the breeding plan to deliver products with prioritized target traits consistent with beneficiary requirements (e.g., growers, processors, and consumers). This can be undertaken with support from the Excellence in Breeding (EiB) program under the CGIAR.
- Improve the clarity, efficiency and cost-effectiveness of the variety release and registration process.** The National Seed Board and the National Variety Release Committee should re-confirm the step-by-step process for

variety release and registration through stakeholder meetings with public and private breeders. The meetings should provide clarity on the specific steps and costs pertaining to variety release as defined in the Seed Regulations, providing an explanation for any divergence. Further, there is a need to ensure that the NVRC is adequately funded to meet twice a year at the beginning of the two seasons.

5. **Develop a client charter on the variety release process** to explain the steps and costs related to variety release. The charter will be disseminated to the public and private breeders and adhered to.
6. **Develop a mechanism/forum for consultation of breeding programs with commercial seed producers to create better alignment for strong, two-way, and sustained partnerships to deliver breeding program gains to farmers.** It is necessary to institute efficient seed production planning for all classes of seed to ensure full alignment of the breeding programs with the seed producers/traders. Align early generation seed production with commercial seed producer needs by establishing a formal process for determining early generation seed requirements. Institute a joint decision-making mechanism with relevant stakeholders for final stage promotion of varieties/hybrids, using high-quality performance data. Organize formal channels (e.g., periodic workshops, publications, and an online presence) where information can easily be accessed to provide research information to both public and private breeders as well as seed producers.
7. **Strengthen the capacity of NSCS to conduct variety evaluation tests.** The Seeds and Plant Act and Regulations provide for the NSCS to conduct variety evaluation tests for DUS and NPT for a prescribed fee. However, NSCS does not conduct these evaluation tests due to limited capacity. NARO conducts the tests on behalf of NSCS, while NSCS monitors the process. The evaluation costs are much higher than the official fees, since NSCS does not conduct the tests. There is a need to assess the capacity requirements for NSCS to efficiently conduct the evaluation test, and provide the necessary resources to conduct these tests.

Component 2: Early Generation Seed (EGS)

Priorities for intervention

1. **Implement NARO framework to streamline production and supply of EGS.** NARO has established a pre-ordering system through which seed companies and local seed businesses can access EGS for certified and quality declared seed, respectively. The system is implemented through NARO Holdings Limited. However, the system faces various challenges including high down-payments, late orders from seed companies, and insufficient awareness or understanding of the system by companies and QDS producers. The procedures need to be clearly elaborated and widely circulated among all NARO institutes, seed companies, and Quality Declared Seed (QDS) producers to ensure they are fully understood. In addition, there is need for a continual two-way dialogue between NARO and the different buyers to address the current and emerging challenges with the system. Further, if all the seed companies and QDS producers adhered to the system, it would allow NARO to forecast the demand for basic seed seasonally.
2. **Implement the Licensing Agreements between seed producers and NARO.** NARO has developed Guidelines for Intellectual Property in 2018 to allow for the access and licensing of varieties to seed companies and QDS producers. These guidelines are partly implemented through Licensing Agreements between breeders and seed companies. The agreements ensure that breeders receive a percentage of the revenue from sales of their developed varieties. Between September and December 2021, 13 seed companies signed Licensing Agreements with breeders. The implementation of the guidelines would need to be closely monitored under the EGS working group to ensure that the intended objectives are realized, and emerging challenges are addressed.
3. **Implement NHL's business plan.** NARO Holdings Ltd (NHL) is the business arm of NARO and its objective is to commercialize NARO technologies, including crop varieties. NHL's activities include the production, processing and marketing of basic seed to seed companies and QDS producers. In support of this main function, NHL has access to land, processing facilities and storage facilities for basic seed. In addition, NHL undertakes activities aimed at raising farmer awareness of NARO varieties. To fulfil this mandate, there is a need for NHL to be supported, and to enhance the collaboration between NHL and seed companies as well as QDS producers.
4. **Develop and implement a roadmap leading to basic seed certification.** Currently, basic seed in Uganda is not certified, as it does not go through the seed certification process under the National Seed Certification Service (NSCS). However, with interventions to streamline and professionalize the production and sale of basic seed from NARO to seed companies and QDS, the necessity exists to ensure that basic seed is certified before it is sold to farmers. NARO and other basic seed producers would need to work closely with NSCS to develop a roadmap leading to the certification of basic seed.

Component 3: Quality Commercial Seed Production

Quality commercial seed production (QCSP) in Uganda is evolving. It is characterized by an active private sector which is supported by fairly strong breeding programs, and a wide agro-dealer network, which is the main seed delivery system. The National Seed Certification Service (NSCS), under the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) is the government entity in charge of seed certification and plant protection. In 2020, NSCS registered 43 seed merchants. Most of these seed companies are members of the Uganda Seed Trade Association (USTA). Quality Declared Seed (QDS) is listed as a seed class in the National Seed Policy of 2018 and implemented through the Seed and Plant (Quality Declared Seed) Regulations of 2020. Before the passing of the QDS Regulations in 2020, 256 local seed businesses were actively producing QDS for different crops.

Key challenges and gaps in Quality Commercial Seed Production (QCSP)

1. Lack of effective collaboration among the seed sector players/stakeholders and entities, seed sector actors, knowledge institutions, researchers, development partners and government regulators.
2. Inadequate knowledge and awareness among seed users on the implications of seed recycling. This reduces demand for seed use as farmers do not see benefits of high yields.
3. Drought lowering seed quality and quantity, especially in the production stages. QDS producers also complained about high input costs and their effects on the production process for quality seed.
4. Weak linkages between researchers and seed users, and limited feedback mechanisms to strengthen demand driven research.
5. Inadequate and poorly regulated supply of EGS, and a prevalence of seed recycling among seed producers. This lowers the genetic potential of the seed before it reaches the farmers.
6. Unplanned purchase of bulk quantities of seed for emergency support may lead to the circulation of counterfeit seed. NGOs and relief organizations that procure seed for emergency relief purposes do not always follow the regulations, one of which is sourcing from registered seed merchants and/or confirming that the seed is certified. The lack of adherence to the regulations encourages suppliers to supply counterfeit seed.
7. Limited capacity to validate the quality of imported seed, especially for vegetable seed.

Priorities for intervention

1. **Strengthen the seed quality control capacities and measures within seed companies and QDS producers.** The Seed and Plant Regulations of 2017 outline the requirements for the registration of seed companies (or seed merchants) in Uganda in terms of human resources and infrastructure. These requirements are intended to ensure that all registered seed companies produce quality commercial seed in line with national, regional and international standards (where applicable). To strengthen this effort, the National Seed Certification Service (NSCS), in collaboration with the Uganda Seed Trade Association (USTA) and NARS, should develop a comprehensive set of registration requirements and protocols for seed companies. The requirements/protocols should include staffing requirements (such as seed technologists), protocols for quality seed production, and protocols for seed processing, among others. In addition, the NSCS and USTA should conduct annual audits of each seed company. When gaps are identified in a company, a plan should be put in place to address them within a given timeline. This approach should also be applied to QDS producers under their respective Local Seed Business (LSB) associations.
2. **Evaluate the early performance of the Seed Tracking and Traceability System (STTS).** NSCS should come up with a comprehensive workplan for the implementation of the STTS, establish infrastructure for the rollout, and organize a quick recap training on STTS technical applications for key seed stakeholders. The National Seed Certification Service recently started using a Seed Tracking and Traceability System to trace the movement of seed from the breeders to the agro-dealers. The initiative, established in 2020, is still in its infancy stage. NSCS, in collaboration with the Uganda Seed Trade Association (USTA) and other actors, should jointly evaluate the initial performance of this tool. This evaluation should (i) identify any emerging bottlenecks and define strategies to address them, (ii) assess the extent to which the digitization of the system enhances the efficiency of its implementation, and (iii) identify any challenges pertaining to the adoption of the system by all the actors.
3. **Evaluate the level of compliance and effectiveness of the standard tamper-proof certification labels issued by NSCS.** The NSCS and the USTA jointly issue tamper proof blue labels for all packaged seed to be used by seed companies and the green labels for QDS class for seed produced in Uganda. All packaged seed must carry these official tamper-proof blue labels for certified seed and tamper-proof green labels for QDS class before it can be sold. This requirement is also stated in the Seed and Plant Regulations of 2017 and the Seed and Plant (QDS) Regulations of 2020 for QDS class. USTA and NSCS need to evaluate: (i) the level of compliance with this requirement by seed companies, (ii) the level of awareness of the purpose of the labels among agro-dealers, and (iii) farmers' level of compliance for QDS producers on the use of tamper-proof green labels. Imported seed and planting materials need to be strictly controlled and regulated under the law of the land.
4. **Assess whether e-verification labels are needed to complement existing labels.** A project on e-verification labels on seed packages was introduced in 2017 and used for three seasons up to 2018. The purpose of the project was to counter the problem of the sale of counterfeit (fake) seed by providing an authentication label on all seed packages. The USTA and NSCS should assess whether this initiative could be revisited, as it would also serve to complement the current system of seed label issuance. To do this, USTA and NSCS should: (i) discuss the technical implications of the new system at the company level, propose a timeline for the roll-out, and agree on a costing structure; (ii) work closely with the Uganda National Bureau of Standards (UNBS), which also issues labels for quality assurance, to ensure there is no duplication of the labels being used; and (iii) work closely with the Uganda National Farmers' Federation (UNFFE), the Uganda National Agro-dealer Association (UNADA), the Ministry of Agriculture Animal Industry and Fisheries (MAAIF) and other actors to develop a comprehensive farmer awareness campaign to ensure that the end-users are informed about the purpose and benefits of the labels. NSCS should review the fees on penalties for non-compliance on quality seed standards to be deterrent enough to minimize prevalence of counterfeit seed. This could involve engaging the Law Reform Commission (LRC).
5. **Increase the capacity of USTA to provide oversight on internal quality control systems within seed companies.** In 2021, USTA hired a quality control officer to work with seed companies to strengthen their internal quality control systems. This is a positive step and needs to be strengthened by: (i) establishing protocols and standards against which seed company performance should be benchmarked; and (ii) assessing if a second quality control officer is required to undertake this task.

6. **Evaluate the performance of the national agricultural support program implemented by the National Agricultural Advisory Services (NAADS).** The government's agricultural input support program, Operational Wealth Creation (implemented by the NAADS), is a major buyer of maize seed (32% of company sales) and bean seed (18% of company sales). The program has been active since 2014. There is a need to evaluate the performance of the program against its original objectives and clearly define, and commit to implementing remedies to the identified challenges.
7. **Review and revisit the mechanisms to finance the operations of the seed industry.** Thus, NSCS should work closely with the private sector to bridge the financing gaps in its operations.

Component 4: Seed Marketing and Distribution

Seed distribution in Uganda is characterized by high government subsidy support and the presence of non-governmental organizations largely related to relief seed. While agro-dealers play an important role by serving an estimated 30% of the market, market distortions arising from non-private seed actors have hampered business growth in the sector and, in many instances, compromised seed quality. Government involvement (and, in some cases, the use of the military) in seed distribution through Operation Wealth Creation (OWC) subsidy program has also affected seed production planning. Seed companies lack reliable data to inform production in subsequent seasons. This leads to either lack of seed (where there was an under-estimation) or surpluses that lead to losses. This creates a volatile situation for seed distributors. However, Uganda has an intermediary seed class called Quality Declared Seed (QDS), with production and distribution of this class of seed carried out by Local Seed Businesses

Gaps in Seed Markets and Distribution

1. Insufficient information on seed demand
2. Inadequacy of seed storage and handling (agro-dealers, seed companies, QDS producers)
3. Weak implementation of the registration system for agro-dealers
4. Weak and insufficiently coordinated seed distribution network
5. Market distortion through entities that offer either free seed or subsidized seed
6. Lack of seed stakeholder commitment to support and strengthen seed distribution networks.
7. Inadequate coverage (spread) of seed distribution points
8. Lack of formal distribution systems for vegetatively propagated planting materials.

Recommendations under Seed Markets and Distribution

1. **Conduct National seed distribution mapping exercise as part of the STTS.** NSCS currently implements the Seed Tracking and Traceability System. One of the components of this system is the registration of seed actors, including seed sellers. The system should be rolled out nationwide to capture all active agricultural input dealers. The system should also capture information such as agro-dealer location, capacity and product scope. The registration should be updated annually and conducted in close collaboration with UNADA and USTA. The collaboration should ensure that data is shared with target users.
2. **Strengthen seed distribution associations.** There is a need to strengthen the seed distribution/agro-dealer networks under the Uganda National Agro-dealers Association (UNADA). UNADA is a platform for all agro-dealers across the country and plays a key role in dialogue and advocacy for a favorable environment for seed distribution. UNADA also needs to collaborate with MAAIF, USTA, Local Government, UNFFE in activities related to agro-dealer networks.
3. **Credit support for business improvement and expansion.** UNADA/USTA/QDS associations to link seed producers/agro-dealers to information and/or affordable credit facilities to enable them to invest in seed scaling initiatives such as proper storage (potentially including facilities such as cold rooms), farm input promotional activities, and general expansion (potentially including vegetatively propagated planting materials).
4. **Build capacity of agricultural training institutes/colleges to offer comprehensive training to agro-dealers on agro-input handling.**
 - a. Identify agricultural training institutes/colleges/private entities in different parts of the country to provide training to agro-dealers in seed management, handling, and use, fertilizer management and safe pesticide use, as a requirement for licensing and registration.
 - b. Develop the training module to include seed business management and handling (including handling carry-over stocks), fertilizer management and safe-pesticide use. Ensure that training modules are up to date.
 - c. Agricultural institutes/colleges/accredited private entities should provide training to agro-dealers on agro-input handling, whereby trainees are examined and awarded certificates at the end of the training. This could build on the training and certification currently offered by the Department of Agricultural Production in the School of Agricultural Sciences at the College of Agricultural and Environmental Sciences (CAES), Makerere University. The trainings are usually advertised by the Uganda National Agro-dealers Association (UNADA) on behalf of MAAIF or any other accredited NGO. Trainees must have at least an O-level education.
5. **Link agro-dealers to farmer organizations.** UNADA, UNFFE & UCA to link agricultural input distributors to district farmer associations to support product promotion through demos, field days and other events.
6. **Explore best practices for the distribution of vegetatively propagated planting material.** MAAIF will explore best

practices in distribution models for a sustainable private sector supply of quality planting materials for vegetatively propagated crops to farmers. This includes best practices for the production, storage and distribution of these materials.

Component 5: Farmer Awareness and Promotion

A well-functioning extension and advisory service operated by the public and private sectors is required for increased agricultural productivity to transform subsistence farming into modern and commercial farming, attain food security, improve incomes, and reduce poverty. The most critical challenges are declining human, capital, and financial resources for public extension without a corresponding private sector input, uncoordinated pluralistic extension service delivery, and poor linkages with extension facilitating tools. The proposed recommendations in this report aim to eliminate gaps that constrain the delivery of quality extension to approximately seven million farming households in Uganda. Public extension is implemented by the Directorate of Agricultural Extension (DAE) under the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) and is guided by the National Agricultural Extension Policy of 2016.

Overview of the gaps under Farmer Awareness and Promotion

1. Inadequate knowledge of seed systems by agricultural extension officers
2. High ratio of agricultural extension officers to farming households (1:1,800)
3. Weak farmer organizations
4. Inadequate channels and messaging approaches for farmer outreach activities (focused on the importance of quality seed, as well as how to distinguish counterfeit seed from genuine seed)
5. Unavailability of small seed packs for promotion to small holder farmers
6. Insufficient investment in farmer awareness and promotion by both the private and public sectors

Priorities under Farmer Awareness and Promotion

1. **Sustain government efforts to register all providers of agricultural extension and advisory services.** MAAIF has developed a process to register all providers of agricultural extension and advisory services. This exercise ensures there is coordination among public and non-state actors that provide these services. There is a need to sustain this effort by continually raising awareness among the service providers and providing periodic updates on the status of the registration exercise.
2. **Increase government budget allocation to agricultural extension services.** The public extension service under MAAIF lacks adequate resources to support extension officers at the national, district and sub-county levels.
3. **Strengthen linkages between government extension services, seed companies, and agro-dealers.** Seed companies usually provide extension and advisory services to farmers to promote the uptake of the varieties that they commercialize. There is need to support strong partnerships between the national/local government, private extension service providers (e.g., village-based agents, seed company extension workers) and farmers in designing extension plans and programs building on the existing efforts of the seed companies.
4. **Establish online resource database of agriculture extension materials.** MAAIF to establish an online resource database of all relevant agricultural extension and training materials that is easily accessible to both farmers and extension workers and included lessons in agronomic practices as well as harvesting, post-harvest handling and processing, and marketing.
5. **Strengthen non-state actors' role in extension provision.** Strengthen farmer organizations, cooperatives and other non-state actors to play a proactive role in the design, rollout and monitoring of programs related to agricultural extension and advisory services across the country.
6. **Develop farmer feedback mechanisms.** Develop a two-way feedback mechanism between farmers and government institutions (National Seed Certification Services (NSCS), National Agricultural Research Organization (NARO) etc.) where farmers can give their feedback on seed quality and variety development
7. **Expand and exploit farmer outreach communication efforts.** Identify, support, and scale functional farmer outreach communication channels such as e-Extension platforms, radio programs to reach farmers nationwide, and in a consistent and sustainable manner.
8. **Add course unit on Seed Science, Seed technology and Seed systems to the curriculum in agricultural colleges/ institutes.** Currently the seed technology course unit is only taught at the Msc and PhD levels.
9. **Convene an Investors' Forum.** The forum would link potential investors to the stakeholders in the seed sector.

Component 6: Policy, Legal and Regulatory Framework (PLR)

The policy, legal and regulatory (PLR) framework provides a lens to assess a country's seed system, identify relevant regulatory good practices and models that have worked in other markets, integrates legal and political economy considerations that can work as incentives (or disincentives) for change, and identifies the interventions to be prioritized. A well-developed policy and regulatory environment are central to a functioning seed system that ensures farmers' access to affordable, available, and appropriate quality seed. The key elements of the seed system are (i) breeding and variety release, (ii) early generation seed supply, (iii) certified seed production, (iv) awareness by farmers, and (v) seed marketing and distribution. Each is affected by, and requires adequacy of the policy and regulatory environment at national, regional and international levels.

Key challenges and gaps in PLR

1. **Regulations to implement the Plant Variety Protection Act are not yet approved.** A legal and regulatory framework on plant variety protection (PVP) or plant breeders' rights (PBR) could be beneficial to the seed sector by creating protection for (public and private) varieties and establishing incentives for breeders. While Uganda's PVP Act is in place, regulations are pending, awaiting ministerial approval, although significant progress has been made. By August 2022, the NSCS/MAAIF had met with representatives from the plant breeders' association and the Solicitor General's office, and finalized all amendments to the Regulations. The current target is for the SG to submit the hard copies to the Minister for signing by the end of September 2022. Follow-up actions have been agreed upon, and are described below.
 - a. The Minister will designate the Office of the Registrar.
 - b. The Minister will designate the relevant personnel to implement the Regulations.
 - c. The Ministry and other stakeholders will raise awareness about the Regulations among users and beneficiaries.
2. **Inconsistent applications for COMESA Seed Regulations.** Uganda's seed regulatory framework is closely aligned with the Common Market for Eastern and Southern Africa (COMESA) Seed Trade Harmonization Regulations, although some gaps continue to exist. NSCS conducts a confirmatory evaluation test even where a variety has been registered in at least two COMESA countries, contrary to the COMESA Seed Trade Harmonization Regulations. Uganda's quarantine pest list has not yet been finalized and published.
3. **Imposition of a pVoC certificate:** The Uganda National Bureau of Standards introduced a requirement for a Pre-import Verification of Conformity to standards (PvoC) certificate in 2019. USTA successfully applied for a temporary waiver of the pVoC for seed companies for two seasons – 2021B and 2022A.⁶ USTA should coordinate engagements between MAAIF and UNBS for seed to be dropped from the list of products that require a pVoC certificate.
4. **Cataloguing of national genetic resources:** Procedures for registration/cataloguing of traditional varieties have been developed and submitted to MAAIF for consideration. MAAIF needs to review and publish these as a schedule in the Seed and Plant regulations. Lack of this provision could lead to erosion of this resource which is critical for future research and development on these varieties. Some traditional varieties are great performers in certain agro-ecologies and can be commercialized if registered with government.

Priorities for intervention

1. **Institute Plant Variety Protection (PVP).** While the PVP Act is in place, the PVP regulations were drafted and are currently awaiting ministerial assent and publication in the gazette. A complete, comprehensive and operational legal and regulatory framework on PVP is an important aspect of an enabling environment for innovation and investment in varietal research and breeding, as well as a foundation for licensing, which helps get quality varieties to farmers faster.
2. **Strengthen NSCS' Capacity to Implement Seed Regulations.** The effective implementation of the Seed Regulations is the backbone of an effective legal and regulatory framework and builds trust in the seed system among industry stakeholders. NSCS's capacity requires improvement to efficiently monitor quality assurance and enforce anti-counterfeiting measures. There is also a need to increase the number of seed inspection personnel, improve the coordination capacity between the NSCS inspectors and the para-inspectors at the sub-county level, purchase equipment for the seed laboratory, and ensure that the field inspections have vehicles and/or motorcycles for their transportation.
3. **Remove requirement for pVoC.** The Uganda Seed Trade Association (USTA) needs to continue working with the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) and the Uganda National Bureau of Standard (UNBS) to push for the permanent removal of the requirement for pVoC for seed imports. The full removal of this requirement will require further dialogue between USTA, MAAIF and UNBS.
4. **Revise Tax Policies.** Tax policies in Uganda were reported to be a challenge to cross-border trade. Specifically, seed companies reported that they were charged taxes on seed exports and imports to/from EAC countries, even though a tax-free regime should have prevailed, with tax refund procedures. There is need for continuous dialogue between USTA and the relevant government agencies including the Uganda Revenue Authority, Ministry of Finance Planning and Economic Development and MAAIF about aspects of the tax regime that affect the seed business.
5. **Fast track the process of farmer variety registration.** The Ministry should continue creating a catalogue for traditional varieties as a schedule in the seed regulations.

Component 7: National Quality Assurance

National governments want to ensure that farmers receive high quality seed from the formal sector. Yet, they often do not have proper quality assurance regulations in place, nor the capacity to implement existing quality assurance regulations well. This results in low quality seed for farmers. A healthy seed system is one in which farmers have confidence that the certified seed meets labelled quality standards. In this system, farmers actively patronize the brands with the highest quality seed of the varieties they want to plant, and seed companies work to exceed quality standards, viewing the regulator as their partner in this quest.

⁶ 2021B is the second season of 2021, while 2022A is the first season of 2022

Gaps under Quality Assurance

1. **Inadequate capacity in NSCS to conduct seed inspection.** NSCS currently has 18 active seed inspectors. In addition to these, 140 district agricultural officers have been trained as para-seed inspectors to complement NSCS field inspections. There is need for NSCS to make institutional arrangements to engage the para-seed inspectors (formal authorization/accreditation) and to provide technical backstopping and routine retooling support for the para seed inspectors. In addition to the human resource capacity, there is a need to equip the inspectors with necessary tools (computers and tablets) and mobility (vehicles and motorcycles) to conduct inspections at the right time.
2. **Lack of ISTA-accredited laboratory.** Under the Seeds and Plant Act and Regulations, national seed certification standards shall be in compliance with internationally recognized standards under ISTA, and seed that is imported should be accompanied by an Orange ISTA certificate (OIC). Since the COMESA Seed Trade Harmonization Regulations also follow ISTA standards, the requirement to comply with these standards at the national level ensures alignment. Unfortunately, Uganda does not yet have an ISTA-accredited laboratory, which affects the regional and international recognition of locally produced seed. NSCS is in the process of pursuing ISTA accreditation for the national seed laboratory for various tests. One of the challenges acknowledged by NSCS is the need to sustain regular payment of membership fees to ISTA.

Recommendations

1. **Conduct scoping studies.** The studies should assess needs for effective field-based quality assurance (QA) activities as well as the current capacity of NSCS to optimally conduct the required field-based QA activities, including field-based inspections and seed sampling. The assessment should reveal the capacity gaps that need to be filled to reach the optimal level for each QA service. The capacity should be assessed in terms of human resources (the number of seed inspectors and para-seed inspectors), the competencies required for the inspectors and analysts, logistical requirements for optimal performance (number of vehicles, motorcycles, tablets) and office infrastructure (especially for officials based away from the NSCS headquarters in Kampala), and budgetary support to fund the operational costs for all QA activities. If necessary, the scoping study would also recommend a transition to private sector/third-party authorization for seed inspections and field-based seed sampling.
2. **Conduct scoping studies for functional Quality Assurance laboratories.** The studies should assess current and anticipated QA laboratory volume, determine adequacy/inadequacy of the current national laboratory at Kawanda and regional seed laboratories in terms of staff numbers, staff experience, staff capacity, equipment, staff locational distribution, training needs, adequacy of facilities, and infrastructure. Thereafter, specific approaches to remedy inadequacies shall be proposed to identify levels of capital investment as well as the annual financing required to deliver viable and adequate seed testing services. If it is recommended and viable that lab-based activities transition to private sector, third-party authorization shall be incorporated into recommendations and findings.
3. **NSCS to consider the need to support establishment of regional mini laboratory to provide services for the regional quality assurance services demand.** This could be initiated by piloting with the already available regional mini laboratory in Northern Uganda. It should also guide government in developing guidelines and institutional arrangements to replicate the mini labs to other regions through effective partnerships with existing institutions, ZARDIs, private sector companies.
4. **Strengthen NSCS seed inspection service capacity.** A seed inspectorate unit should be strengthened for proper surveillance and monitoring, including the para-seed inspectors at the district level. The strengthening should be informed by the scoping study in (1) above. The strengthening should (a) enable available inspectors effectively perform their function; (b) develop a program to provide regular technical support (trainings, reporting, manuals, audit functions) and monitor the functions of the para-seed inspectors; and (c) enhance NSCS capacity to conduct surveillance at the seed company and seed retail levels, in collaboration with the Uganda Police.
5. **Expand the crop scope/portfolio for seed QA.** Support the National Seed Certification Service (NSCS) in developing protocols for all priority scheduled/focus crops with a view to formalize seed certification for a wider range of crops, including for forage seed crops and vegetatively propagated materials.
6. **Establish an ISTA-accredited seed laboratory.** NSCS to fast track the renovation of the laboratory to aid the accreditation process to ISTA standards to both serve as a valid reference laboratory and issue export certificates. Bring in appropriate technical advice to advise on steps and investment required.
7. **Invest in the technical and infrastructure capacity of the seed laboratory:** Invest in the capacity building (trainings and refresher courses) of the lab technicians and inspectors to support the effective functioning of the lab and also be up to date with evolving technologies.
8. **Utilize the Seed Tracking and Traceability System (STTS)** to enhance seed service delivery. NSCS should:
 - a. Conduct an independent assessment of the STTS to evaluate its performance
 - b. Develop and implement a comprehensive program for the rollout of the STTS. These should include IT capacity at NSCS, training of users, infrastructure requirements (laptops, computers, internet), technical backstopping of STTS users, and awareness to the targeted stakeholder groups like agrodealers and breeders. This will provide a comprehensive rollout to STTS.

Component 8: National Planning and Coordination (NPC)

Key gaps and challenges in National Planning and Coordination

1. **National Seed Board does not meet regularly:** The Seeds and Plant Act establishes the National Seed Board (NSB) to supervise the implementation of the seed law and advise the Minister on seed issues. The NSB was instituted in November 2019, and is chaired by the Director of Crop Resources with NSCS as the Secretariat. However, it has not met post COVID-19 due to social distancing restrictions. The NSB last met in November 2019, but the normal schedule is expected to resume following the lifting of these restrictions.
2. **Difficulty in access to information for seed planning and coordination:** Coordination of the seed sector is the role of the NSCS as established in the Seed Act and regulations. There is difficulty in accessing data and information on seed as most of it is manually documented. NSCS should be supported to undertake a phased migration of this data into the STTS in a sustainable manner.

Priorities for intervention

1. **Convene the National Seed Board regularly.** The NSCS should convene the sitting of the NSB regularly to advise the Minister on seed policy issues.
2. **Digitalize the NSCS data.** This will support the seed industry players in generating information for seed demand and supply forecasting and general seed sector planning.
3. **Produce an Annual Report on the Status of the Seed Sector in Uganda.** The National Seed Certification Service should produce an annual report on the Status of the Seed Sector in Uganda. The report would:
 - a. provide the relevant statistics on the seed sector including seed production (of all classes), seed trade, status of quality assurance measures and on-going initiatives.
 - b. provide a progress update on the status of implementation of the National Seed Strategy and Investment Plan; and
 - c. provide a forecast for seed supply in the forthcoming year.

Lastly, the report should be presented during the proposed Annual Seed Sector Stakeholder" conference.

Section 6:

Results framework

The results framework describes targets under each strategic intervention in the different thematic areas. Table 5 below presents the detailed results framework for the Seed Strategy and Investment Plan.

Table 7: Results Framework

Component 1: Breeding, Variety Release and Maintenance			
Strategic intervention	Specific action	Target result(s)	Target year of achievement of result
Develop a business case and prioritize investments to ensure research programs are supported with suitable infrastructure (laboratory, greenhouse, seed storage etc.) to carry out their research activities	Hire external breeding expert to work with NARO/MaRCCI to develop business case for the different crop breeding programs. This exercise can be guided by the CGIAR Excellence in Breeding initiative which aims to modernize crop breeding programs.	Improve the functionality of the research programs through capacity building and provision of the necessary equipment.	2024
Develop a funding strategy to meet goals for variety development, release and maintenance of germplasm	Hire external breeding expert to work with NARO/ MaRCCI to develop funding strategy that would: (i) evaluate current funding strategy, (ii) identify alternative funding sources, (iii) identify potential cost reduction strategies.	NARO funding strategy has been developed and validated by the NARO Governance Board, and is being implemented.	2023
	The NARO Board/ MaRCCI Board should discuss and validate the report and then implement the recommendations.	MaRCCI funding strategy has been developed and validated by the NARO Governance Board, and is being implemented.	2023
Design a breeding program based on clear definitions of product profiles and target crop growing environments with a focus on delivering realized genetic gain to farmers	Every breeding program to begin with farmer needs assessment or participatory research assessment.	Farmers' preferences identified and addressed.	2023
Improve the clarity, efficiency and cost-effectiveness of the variety release and registration process	National Seed Board and National Variety Release Committee to convene meeting with breeders (public and private) to explain the step-by-step process for variety release and registration, explaining any diversions from the process and costs outlined in the Seed Regulations. The output is an agreement on the challenges that need to be addressed. Develop a client charter.	Accountability and transparency improved	2023
	Develop a client charter that outlines the specific services that will be offered by NSCS.	Client charter is developed and successfully adhered to.	2023
Strengthen the capacity of NSCS to conduct evaluation tests as part of the variety release and registration process	Assess the human resource and logistical capacity of NSCS to effectively conduct variety evaluation tests and then avail resources to address any capacity limitations.	Assessment of the capacity of NSCS to conduct evaluation tests has been conducted and capacity gaps identified.	2023
		NSCS has been adequately funded to address gaps related to the capacity to conduct variety evaluation tests.	2024
Component 2 – Early Generation Seed			
Strategic intervention	Specific action	Target result(s)	Target year of achievement of result

Implement NARO framework for production and supply of basic seed	Monitor the implementation of this framework through a structured arrangement for feedback from seed companies and QDS producers.	EGS working group has instituted system to monitor the implementation of the NARO system for pre-booking basic seed, and address bottlenecks identified in the system.	2022
		All seed producers (seed companies and QDS producers) sourcing basic seed from NARO are using the new system of pre-booking.	50% by 2024 and 100% by 2026
Implement framework for access and licensing of NARO varieties	Monitor the implementation of this framework through a structured arrangement for feedback from seed companies and QDS producers.	EGS working group has instituted system to monitor the implementation of the licensing agreements between NARO and seed producers (seed companies and QDS producers) .	2022
		All NARO-owned varieties being commercialized are licensed to seed companies or QDS producers.	2024
Implement NARO Holdings Business plan	Sustain the current activities and implement the planned activities in the NHL business plan.		On-going
	Monitor the implementation of the NHL business plan regularly sharing updates with the industry stakeholders.	NARO Holding Ltd consistently provides updates (at least more than once a year) on the implementation of the NHL business plan to the seed industry stakeholders.	2023
Develop roadmap leading to certification of basic seed	Convene meeting between NSCS and NARO to discuss the general steps to be taken leading to certification of basic seed.	Roadmap leading to certification of basic seed discussed and agreed between NARO, NSCS and USTA (including seed companies).	2023
	Prepare draft roadmap leading to certification of basic seed. Draft document should be discussed within the working group, and NSCS should be part of the discussion.		

Component 3 – Quality Commercial Seed Production

Strategic intervention	Specific action	Proposed target result(s)	Proposed target year of achievement of result
Strengthen internal seed quality control measures within seed companies & QDS producers	NSCS and USTA should jointly define a comprehensive set of requirements for registration of seed companies. These requirements would complement the guidelines in the Seed Regulations.	Requirements for registration of seed companies reviewed and revised by stakeholders.	2023
	NSCS and USTA should develop and implement a program to jointly monitor the internal capacities for seed companies with regard to seed quality control.	All seed companies that are members of USTA undergo an assessment of their internal capacities on seed quality control	2023
	NSCS and ISSD Uganda should develop and implement a program to monitor the capacities of the QDS producers with regard to seed quality assurance.	Maintain a credible seed quality in the country.	
Evaluate the performance of the STTS program under NSCS	Conduct an independent evaluation to assess the performance of the STTS initiative.	An independent assessment of the STTS has been conducted and the findings discussed among the stakeholders (including the funders).	2023

Evaluate the level of compliance and effectiveness of the seed labels issued by NSCS and USTA	Conduct an independent evaluation of the uptake of the seed labels to assess: (i) the level of compliance on the use of the seed labels among seed companies and QDS producers, and (ii) the level of awareness of the purpose of the seed labels among farmers and agro-dealers.	An independent assessment of the uptake of the seed labels has been undertaken and the findings discussed among the stakeholders.	2023
Assess whether e-verification labels are needed to complement the existing labels	Assess the viability and efficacy of the e-verification labels to complement the current seed labels. The assessment should: (i) discuss the technical implications of the new system at the company level, propose a timeline for the roll-out, and agree on a costing structure, (ii) work closely with the Uganda National Bureau of Standards (UNBS), which also issues labels for quality assurance, to ensure there is no duplication of the labels being used, (iii) include a comprehensive farmer awareness campaign.	Recommendation from stakeholders on the use of the e-verification labels has been issued.	2023
		A system for e-verification labels has been designed in close collaboration with the stakeholders, explaining the technical implications, in coherence with the UNBS quality labels and with a comprehensive farmer outreach strategy. (This is applicable if stakeholders recommend the use of the e-verification labels)	2024
		The system for e-verification labels has been deployed and adopted by all active seed companies, and a comprehensive farmer awareness program has been rolled out.	2024
Strengthen USTA capacity to provide support to seed quality control at seed company level	USTA should hire an additional quality control officer.	A 2nd quality control officer for USTA has been hired.	2023
	USTA should: (i) develop protocols and guidelines to assess the quality control capacities of seed companies. The quality control should cover the organizational capacities (human resource), production practices, processing facilities, (ii) produce evaluation reports at the end of every assessment, to guide any corrective measures needed to be taken	USTA Quality Control officers have assessed all seed companies that are USTA members, have developed evaluation reports, and are providing support to companies in seed quality control.	2023

Component 4: Seed Marketing and Distribution

Strategic intervention	Specific action	Target result(s)	Target year of achievement of result
Conduct National seed distribution mapping exercise as part of the Seed Tracking and Traceability System (STTS)	Convene regular meetings with agro-dealers and UNADA to: (i) explain the STTS system, (ii) initiate their registration onto the system, (iii) monitor agro-dealers' compliance with the system.	Country-wide awareness about the STTS for agro-dealers conducted in all regions.	2024
		80% of all active agro-dealers in the country are profiled and entered into the STTS system.	2024
Strengthen UNADA and the sub-national seed distribution associations	Develop a strategic plan for UNADA that focuses on strengthening the sub-national agro-dealer associations as well as the individual agro-dealer businesses.	A strategic plan aimed at strengthening the agro-dealer networks is developed and implemented by UNADA.	2023

Build capacity of agricultural training institutes/colleges to offer comprehensive training to agro-dealers on agro-input handling	Build capacity of agricultural training colleges. Two colleges, Bukalasa Agricultural college and Busitema University have been pre-selected.	Agricultural colleges, institutes that would be accredited to train agro-dealers identified.	2022
		Modules for training of agro-dealers on agro-input handling developed (build on current module at Makerere on safe pesticide use).	2024
		70% of all registered and active agro-dealers trained by accredited institutions (agricultural colleges, institutes, private entities).	2025
Link agro-dealers to private sector extension agents and farmer organizations	Link agricultural input distributors to private extension agents such as Village Based Advisors (VBAs) and farmer organizations/cooperatives to support product promotion through demos and field days and income opportunities (commissions) for the agents to sustain their work.	UNADA has developed and is implementing a program aimed at linking agro-dealer networks to farmer organizations and cooperatives.	2024
Strengthen system for production, storage and distribution of vegetatively propagated planting material	Explore best practices for distribution models for sustainable private sector supply of quality assured planting materials for vegetatively propagated crops to farmers. This includes best practices for production, storage and distribution of these materials.	Best practice and models for private sector supply for key vegetatively propagated crops (such as potatoes, sweet potatoes, cassava and bananas, forage) are identified and documented.	2023
		Best practice and models for private sector supply for key vegetatively propagated crops (such as potatoes, sweet potatoes, cassava and bananas, forage), are utilized by seed producer groups across the country.	2024
Component 5: Farmer Awareness and Promotion			
Sustain government efforts to register all providers of agricultural extension and advisory services	Roll-out MAAIF efforts to register all providers of agricultural extension and advisory services in Uganda, including private actors, NGOs, community-based entities, universities and individual/corporate professional entities.	All providers of agricultural extension and advisory services in Uganda registered by MAAIF.	2024
Strengthen linkages between government extension services and seed companies and agro-dealers	Seed companies and MAAIF to consider developing and implementing a joint program for agricultural extension and advisory services to complement their efforts and expand outreach.	All seed companies and agro-dealers linked to government extension services.	2024
Establish online resource database of agriculture extension materials	Establish an online resource database of all relevant agricultural extension and training materials that can easily be accessed by both farmers and extension workers.	Online resource database with agricultural extension materials has been launched and documents uploaded.	2023
Strengthen farmer organizations' role in extension service provision	Farmer organization and cooperatives to strengthen their structures to play a proactive role in the design, rollout and monitoring of programs related to agricultural extension and advisory services across the country.	At least 100 farmer organizations/cooperatives/ Non-State Actors trained in seed management topics.	2023
Develop farmer feedback mechanisms	Develop a two-way feedback mechanism between farmers and government institutions (National Seed Certification Services (NSCS), National Agricultural Research Organization (NARO), MAAIF) and seed suppliers, where farmers can give their feedback on seed quality and variety development	Platform for two-way feedback between farmers and private actors (e.g., seed suppliers) and government agencies (NSCS, NARO, MAAIF) developed.	2023

Expand and exploit farmer outreach communication	Identify, support and scale functional farmer outreach communication channels such as e-Extension platforms, radio programs so that they can reach farmers nationwide, and in a consistent and sustainable manner.	Successful farmer outreach interventions identified and scaled out.	2024
Component 6: Policy Legal and Regulatory			
Strategic intervention	Specific action	Target result(s)	Target year of achievement of result
Approve the Plant Variety Protection Regulations	MAAIF should follow up on the approval of the PVP Regulations with the Cabinet.	PVP Regulations approved by Cabinet.	2022
Strengthen NSCS Capacity to Implement Seed Regulations			
Review Tax Policies that affect seed importation and exportation	USTA should seek clarity on taxation regime that affects seed importation and exportation. This should be done through dialogue with MAAIF, Uganda Revenue Authority (URA) and MFPED.	Agreement on tax regime affecting seed importation and exportation reached through dialogue between MFPED, URA, MAAIF and USTA.	2023
Removal of requirement for Pre-Verification Certificate of Conformity (pVoC) for seed importation	USTA should continue advocacy for the removal of the requirement for pVoC for seed importers.	Removal of pVoC as requirement for seed importation has been approved by UNBS.	2023
Component 7: Quality Assurance			
Strategic intervention	Specific action	Target result(s)	Target year of achievement of result
Conduct scoping study to assess needs for effective field-based QA activities	NSCS management to internally conduct a needs assessment for effective field-based activities Quality Assurance activities.	Needs assessment for effective field-based QA activities has been conducted and the recommendations are being adopted by NSCS.	2023
Conduct scoping studies for functional Quality Assurance laboratories	Conduct scoping study to assess current and anticipated QA laboratory volume, determine adequacy/inadequacy of current national (at Kawanda) and regional seed laboratories in terms of staff numbers, staff experience, staff capacity, equipment, staff locational distribution, training needs, adequacy of facilities, and infrastructure.	Scoping study to assess the functionality of the national and regional seed laboratories has been conducted and the recommendations are being adopted by NSCS.	2023
Strengthen NSCS seed inspection capacity	Strengthen the NSCS to effectively conduct at quality assurance activities under their mandate.	NSCS has at least 20 seed inspectors who are well-facilitated to conduct field-based seed inspections and to monitor para seed inspectors & private/third party authorized seed inspectors.	2023
		At least 10 private/ third-party seed inspectors have been authorized and are actively conducting seed inspections, with supervision from NSCS inspectors.	2023
		At least one private seed laboratory has been authorized by NSCS to conduct seed tests, with supervision from NSCS.	2024
Expansion of crop scope/portfolio for seed QA	Develop protocols for all priority scheduled/focus crops with a view to formalizing seed certification for a wider range of crops, including for vegetatively propagated materials.	Quality Assurance protocols (especially seed standards) for all scheduled crops, including vegetatively propagated crops, have been developed and adopted by NSCS.	2022

Establishment of ISTA-accredited seed laboratory	Support development of a new ISTA-accredited lab or upgrading of a current lab to ISTA standards to both serve as a valid reference laboratory and issue export certificates.	National seed laboratory has received ISTA accreditation for seed testing services.	2022
Utilize the Seed Tracking and Traceability System (STTS) to enhance seed service delivery.	Roll out the various services offered through the STTS to all the seed actors and raise awareness of the benefits to enhance its utilization.	STTS has been rolled out to all seed companies, breeders (producers of EGS) and agro-dealers and at least 75% of certified seed production can be tracked and traced through the system.	2022

Component 8: National Planning and Coordination

Strategic intervention	Specific action	Target result(s)	Target year of achievement of result
Strengthen the National Seed Board: Support efforts to strengthen the National Seed Board as a functional unit under MAAIF to carry out seed system planning and coordination	Clarify the roles of the National Seed Board Strengthen the National Seed Board as a functional unit under MAAIF to carry out seed system planning and coordination.	National Seed Board is fully functional and meets quarterly.	2022
Reassess the viability of the Uganda Plant Health and Inspectorate Agency	Reassess the viability of the Uganda Plant Health and Inspectorate Agency. The National Seed Policy proposes to transform the National Seed Certification Service into an agency, called the Uganda Plant Health and Inspectorate Agency.	Uganda Plant Health and Inspectorate Agency has been established by an Act of Parliament.	2024
Support the NSCS to adopt and implement an economically robust framework for seed supply forecasting to facilitate stakeholder decision-making.	NSCS to convene meeting with USTA, seed companies and QDS producers to develop framework for forecasting seed supply in the country.	Framework for forecasting annual seed supply has been developed and adopted by NSCS, seed companies and QDS producers.	2022
Produce Annual Report on the Status of the Seed Sector in Uganda	Produce Annual Report on the Status of the Seed Sector in Uganda: The National Seed Board should work with the National Seed Certification Service to produce an annual report on the Status of the Seed Sector in Uganda.	Annual Report on the Status of the Seed Sector in Uganda is being produced and disseminated during an Annual Seed Stakeholders' Conference.	2022

Section 7:

Investment cost

The total estimated investment cost to implement this Seed Sector Strategy is UGX 4,448,000,000 (Four Billion, Four Hundred Forty-Eight Million Uganda Shillings), equivalent to about USD 1,218,630 (One Million, Two Hundred Eighteen Thousand, Six Hundred Thirty US Dollars). Table 9 presents a breakdown of the investment cost by component. The components that require the highest investments are Quality Assurance (QA) and Quality Commercial Seed Production (QCSP). The high investment cost for QA pertain to strengthening the seed inspection function at NSCS, while the high costs for QCSP pertain to establishing seed laboratories for seed companies and building the capacity with USTA to support quality control efforts by seed companies. The high costs in these two components all pertain to quality assurance, as this is priority in the seed industry in Uganda. It is important to note that the costs of the seed laboratories for the seed companies will be borne by the companies. Some of the components have a relatively low investment cost due to on-going activities in the respective areas.

Table 8: Breakdown of Investment cost by Component

Component	Estimated budget (UGX)	Percentage
Breeding Variety Release and Maintenance	210,000,000	5%
Early Generation Seed	150,000,000	3%
Quality Commercial Seed Production	1,088,000,000	24%
Seed Marketing and Distribution	490,000,000	11%
Farmer Awareness and Promotion	180,000,000	4%
Policy, Legal and Regulatory Framework	220,000,000	5%
Quality Assurance	2,005,000,000	45%
National Policy and Coordination	105,000,000	2%
Total	4,448,000,000	100%

Table 7 provides a detailed breakdown of the investment costs by component and by priority activity.

Table 9: Detailed breakdown of Investment cost by component

Component 1: Breeding, Variety Release and Maintenance				
Strategic intervention	Specific action	Responsible	Budget (estimate) in UGX	Budget notes
Develop a business case and prioritize investments to ensure research programs are supported with suitable infrastructure (laboratory, greenhouse, seed storage etc.) to carry out their research activities	Hire external breeding expert to work with NARO/MaRCCI to develop business case for the different crop breeding programs. This exercise can be guided by the CGIAR Excellence in Breeding initiative which aims to modernize crop breeding programs.	NARO, MaRCCI	50,000,000	Fees for external expert
Develop funding strategy to meet goals for variety development, release and maintenance of germplasm	Hire external breeding expert to work with NARO/ MaRCCI to develop funding strategy that would: (i) evaluate current funding strategy, (ii) identify alternative funding sources, (iii) identify potential cost reduction strategies.	NARO, MaRCCI	50,000,000	Fees for external expert
	The NARO Board/MaRCCI Board should discuss and validate the report and then implement the recommendations.	NARO, MaRCCI	0	no cost

Improve the clarity, efficiency and cost-effectiveness of the variety release and registration process	National Seed Board and National Variety Release Committee to convene meeting with breeders (public and private) to explain the step-by-step process for variety release and registration, explaining any diversions from the process and costs outlined in the Seed Regulations. The output is an agreement on the challenges that need to be addressed.	NSCS (NVRC)	30,000,000	Meeting costs
	Develop client charter outlining the process and cost of the variety release process. Convene meeting to disseminate the client charter.	NSCS (NVRC)	20,000,000	Meeting costs
Strengthen the capacity of NSCS to conduct evaluation tests as part of the variety release and registration process	Assess the human resource and logistical capacity of NSCS to effectively conduct variety evaluation tests and then avail resources to address any capacity limitations.	MAAIF (NSCS)	60,000,000	Two (2) NVRC meetings per year, at 10,000,000 per meeting, for 3 years.
TOTAL			210,000,000	
Component 2 – Early Generation Seed				
Strategic intervention	Specific action	Responsible	Estimated cost (UGX)	Budget notes
Implement NARO framework for production and supply of basic seed	Monitor the implementation of this framework through a structured arrangement for feedback from seed companies and QDS producers.	NARO	50,000,000	Meeting costs
Implement framework for access and licensing of NARO varieties	Monitor the implementation of this framework through a structured arrangement for feedback from seed companies and QDS producers.	NARO	50,000,000	Meeting costs
Implement NARO Holdings Business plan	Sustain the current activities and implement the planned activities in the NHL business plan	NHL	0	Costs covered by NHL
	Monitor the implementation of the NHL business plan regularly sharing updates with the industry stakeholders	NHL	0	Costs covered by NHL
Develop roadmap leading to certification of basic seed	Convene meeting between NSCS and producers of basic seed including NARO, Makerere University, seed companies and Uganda Christian University to discuss the general steps to be taken leading to certification of basic seed. Meetings should be coordinated by the EGS working group under NARO	NSCS, NARO (EGS working group), Makerere University, MaRCCI	50,000,000	Series of meetings of the EGS working group, and technical meetings with NSCS
	Prepare draft roadmap leading to certification of basic seed. Draft document should be discussed within the working group, and NSCS should be part of the discussion			
Total			150,000,000	
Component 3: Quality Commercial Seed Production				
Strategic intervention	Specific action	Responsible	Estimated cost (UGX)	Budget notes

Strengthen internal seed quality control measures within seed companies (& QDS producers)	NSCS and USTA should jointly define a comprehensive set of requirements for registration of seed companies. These requirements would complement the guidelines in the Seed Regulations	NSCS, USTA	0	No cost
	NSCS and USTA should develop and implement a program to jointly monitor the internal capacities for seed companies with regard to seed quality control	NSCS, USTA	0	same as #13 below
	NSCS and ISSD Uganda should develop and implement a program to monitor the capacities of the QDS producers with regard to seed quality assurance	NSCS, ISSD Uganda	50,000,000	Meeting costs, travel costs
	Feasibility assessment for establishment of seed laboratories Infrastructure costs including procurement and installation of necessary laboratory equipment.	Seed companies	630,000,000	Establishment of seed laboratories. Cost to be borne by private sector
Evaluate the performance of the STTS program under NSCS	Conduct an independent evaluation to assess the performance of the STTS initiative.	NSCS	30,000,000	Hiring an external evaluator
Evaluate the level of compliance and effectiveness of the seed labels issued by NSCS and USTA	Conduct an independent evaluation of the uptake of the seed labels to assess: (i) the level of compliance on the use of the seed labels among seed companies and QDS producers, and (ii) the level of awareness of the purpose of the seed labels among farmers and agro-dealers.	NSCS	30,000,000	Hiring an external evaluator
Assess whether e-verification labels are needed to complement the existing labels	Assess the viability and efficacy of the e-verification labels to complement the current seed labels. The assessment should: (i) discuss the technical implications of the new system at the company level, propose a timeline for the roll-out, and agree on a costing structure, (ii) work closely with the Uganda National Bureau of Standards (UNBS), which also issues labels for quality assurance, to ensure there is no duplication of the labels being used, (iii) include a comprehensive farmer awareness campaign	NSCS	20,000,000	Meeting costs
Strengthen USTA capacity to provide support to seed quality control at seed company level	USTA should hire an additional quality control officer	USTA	288,000,000	Salary costs and transport costs for three years
	USTA should work with NSCS to develop a program for assessing the internal quality control capacities of seed companies. This entails: (i) developing protocols and guidelines to assess the quality control capacities of seed companies. The quality control should cover the organizational capacities (human resource), production practices, processing facilities, (ii) producing evaluation reports at the end of every assessment, to guide any corrective measures that need to be taken	USTA	40,000,000	Hiring an external expert to work with USTA to develop these protocols and guidelines
TOTAL				

Component 4: Seed Marketing and Distribution

Strategic intervention	Specific action	Responsible	Estimated cost (UGX)	Budget notes
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Conduct National seed distribution mapping exercise as part of the Seed Tracking and Traceability System (STTS)	Convene regular meetings with agro-dealers and UNADA to: (i) explain the STTS system, (ii) initiate their registration onto the system, (iii) monitor agro-dealers' compliance with the system.	UNADA, NSCS	100,000,000	Meeting costs and transport costs across the country
Strengthen UNADA and the sub-national seed distribution associations	Develop a strategic plan for UNADA that focuses on strengthening the sub-national agro-dealer associations as well as the individual agro-dealer businesses.	UNADA	30,000,000	Meeting costs and hiring an expert to work with UNADA to draft the Strategic plan
Build capacity of agricultural training institutes/colleges to offer comprehensive training to agro-dealers on agro-input handling	Identify agricultural colleges/institutes that can provide training to agro-dealers	MAAIF	0	No cost
	Develop and deploy training modules to selected agricultural colleges/ institutes and other private entities	MAAIF	150,000,000	Training costs (materials & trainers' costs)
Link agro-dealers to private sector extension agents and farmer organizations	Link agricultural input distributors to private extension agents such as Village Based Advisors (VBAs) and farmer organizations/cooperatives to support product promotion through demos and field days and income opportunities (commissions) for the agents to sustain their work.	MAAIF	100,000,000	-
Strengthen system for production, storage and distribution of vegetatively propagated planting material.	Explore best practices for distribution models for sustainable private sector supply of quality assured planting materials for vegetatively propagated crops to farmers. This includes best practices for production, storage and distribution of these materials.	MAAIF	40,000,000	Hire expert to conduct assessment
TOTAL			420,000,000	
Component 5: Farmer Awareness and Promotion				
Strategic Intervention	Specific action	Responsible	Estimated cost (UGX)	Budget notes
Sustain government efforts to register all providers of agricultural extension and advisory services.	Roll-out MAAIF efforts to register all providers of agricultural extension and advisory services in Uganda, including private actors, NGOs, community-based entities, universities and individual/corporate professional entities.	MAAIF	100,000,000	Staff costs, transport costs
Strengthen linkages between government extension services and seed companies and agro-dealers	Developing and implement a joint program for agricultural extension and advisory services to complement their efforts and expand outreach.	MAAIF, Seed companies	30,000	Meeting costs, and hiring an expert on agricultural extension
Establish online resource database of agriculture extension materials	Establish an online resource database of all relevant agricultural extension and training materials that can easily be accessed by both farmers and extension workers.	MAAIF	50,000,000	Hiring an IT expert to set up online resource data base
Strengthen farmer organizations' role in extension service provision	Farmer organization and cooperatives to strengthen their structures to play a proactive role in the design, rollout and monitoring of programs related to agricultural extension and advisory services across the country.	UNFFE, UCA	TBD	

Develop farmer feedback mechanisms.	Develop a two-way feedback mechanism between farmers and government institutions (NSCS), National Seed Certification Services (NSCS), National Agricultural Research Organization (NARO), MAAIF) and seed suppliers, where farmers can give their feedback on seed quality and variety development.		TBD	
Expand and exploit farmer outreach communication.	Identify, support and scale functional farmer outreach communication channels such as e-Extension platforms, radio programs so that they can reach farmers nationwide, and in a consistent and sustainable manner.	MAAIF	TBD	
TOTAL			180,000,000	

Component 6: Policy Legal and Regulatory

Strategic intervention	Specific action	Responsible	Estimated cost (UGX)	Budget notes
Approve the Plant Variety Protection Regulations	MAAIF should follow up on the approval of the PVP Regulations with the Cabinet.	MAAIF	0	On-going. No cost
Strengthen NSCS Capacity to Implement Seed Regulations	Hire additional staff at NSCS to assist to undertake their mandate.	MAAIF	200,000,000	
Review Tax Policies that affect seed importation and exportation	USTA should seek clarity on taxation regime that affects seed importation and exportation. This should be done through dialogue with MAAIF, Uganda Revenue Authority (URA) and MFPED.	MAAIF, USTA	10,000,000	On-going. Minimal budget for Meeting costs
Removal of requirement for Pre-Verification Certificate of Conformity (PVoC) for seed importation	USTA should continue advocacy for the removal of the requirement for PVoC for seed importers.	USTA	10,000,000	On-going. Minimal budget for meeting and transport costs
TOTAL			220,000,000	

Component 7: Quality Assurance

Strategic intervention	Specific action	Responsible	Estimated cost (UGX)	Budget notes
Conduct scoping study to assess needs for effective field-based QA activities	NSCS management to internally conduct a needs assessment for effective field-based activities Quality Assurance activities.	NSCS	40,000,000	Hiring an external expert to conduct a needs assessment
Conduct scoping studies for functional Quality Assurance laboratories	Conduct scoping study to assess current and anticipated QA laboratory volume, determine adequacy/inadequacy of current national (at Kawanda) and regional seed laboratories in terms of staff numbers, staff experience, staff capacity, equipment, staff locational distribution, training needs, adequacy of facilities, and infrastructure.	MAAIF	100,000,000	Hiring an expert to conduct scoping study
Strengthen NSCS seed inspection capacity	Develop and implement program for monitoring performance of para inspectors. Costs include meeting costs. Hiring an expert to work with NSCS & para inspectors to develop program.	MAAIF	30,000,000	Funds to address gaps identified in scoping study

	Hiring additional 10 seed inspectors and paying salary for 3 years. Estimated annual salary of UGX 51,000,000 for Senior Officer, under government Civil Service Salary Structure		1,530,000,000	Salary for 10 seed inspectors
	Procurement of two vehicles for seed inspectors. Two vehicles at UGX 60,000,000 and maintenance costs		140,000,000	Motor vehicles
Expansion of crop scope/portfolio for seed QA	Develop protocols for all priority scheduled/focus crops with a view to formalizing seed certification for a wider range of crops, including for vegetatively propagated materials.	MAAIF	40,000,000	Meeting of experts to develop protocols and standards. NSCS to first develop draft.
Establishment of ISTA-accredited seed laboratory	Support development of a new ISTA-accredited lab or upgrading of a current lab to ISTA standards to both serve as a valid reference laboratory and issue export certificates.	MAAIF	0	Government is financing on-going rehabilitations on the laboratory at Kawanda
Utilize the Seed Tracking and Traceability System (STTS) to enhance seed service delivery.	Roll out the various services offered through the STTS to all the seed actors and raise awareness of the benefits to enhance its utilization.	NSCS	85,000,000	Training and meeting costs
TOTAL				

Component 8: National Planning and Coordination

Strategic intervention	Specific action	Responsible	Estimated cost (UGX)	Budget notes
Strengthen the National Seed Board: Support efforts to strengthen the National Seed Board as a functional unit under MAAIF to carry out seed system planning and coordination	Clarify the roles of the National Seed Board Strengthen the National Seed Board as a functional unit under MAAIF to carry out seed system planning and coordination	MAAIF	40,000,000	Meeting costs and travel costs
Reassess the viability of the Uganda Plant Health and Inspectorate Agency	Reassess the viability of the Uganda Plant Health and Inspectorate Agency. The National Seed Policy proposes to transform the National Seed Certification Service into an agency, called the Uganda Plant Health and Inspectorate Agency.	MAAIF	5,000,000	Meeting costs
Support the NSCS to adopt and implement an economically robust framework for seed supply forecasting to facilitate stakeholder decision-making	NSCS to convene meeting with USTA, seed companies and QDS producers to develop framework for forecasting seed supply in the country.	NSCS, USTA	0	Meeting costs
Produce Annual Report on the Status of the Seed Sector in Uganda	Produce Annual Report on the Status of the Seed Sector in Uganda: The National Seed Board should work with the National Seed Certification Service to produce an annual report on the Status of the Seed Sector in Uganda.	NSCS	0	No cost –normal office time used

Convene annual seed sector stakeholder conference to monitor implementation of the Seed Sector Strategy and assess industry performance	Stakeholder meeting bringing together players in the seed sector in the country. The meeting will be held over several days and will include a presentation of the Annual Report on the Status of the Seed Sector in Uganda.	NSCS	60,000,000	Meeting costs. Cost per year is about UGX 20 million
TOTAL			105,000,000	

Annex 1:

Contributors

The following key seed sector stakeholders contributed to the draft of this report.

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