



MINISTRY OF AGRICULTURE

NIGERIA SEED SECTOR STRATEGY AND INVESTMENT PLAN



MAY 2025



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ACRONYMS

AGRA	Alliance for a Green Revolution in Africa
BASICS	Building a Sustainable, Integrated Seed System for Cassava
BPAT	Breeding Performance Assessment Tool
CBN	Central Bank of Nigeria
CGIAR	Consultative Group for International Agricultural Research
CSP	Collaborative Seed Program
DUS	Distinctness, Uniformity and Stability
ECOWAS	Economic Commission for West African States
EGS	Early Generation Seed
FMARD	Federal Ministry of Agriculture and Rural Development
IITA	International Institute of Tropical Agriculture
ISTA	International Seed Testing Association
NACGRAB	National Center for Genetic Resources and Biotechnology
NASC	National Agricultural Seed Council
NIRSAL	Nigeria Incentive-Based Risk Sharing System for Agricultural Lending
NSP	National Seed Sector Platform
NVRC	National Variety Release Committee
PVP	Plant Variety Protection
SEEDAN	Seed Entrepreneurs Association of Nigeria
SeedSAT	Seed Systems Assessment Tool
TASAI	The African Seed Access Index
VCU	Value for Cultivation and Use
WUR	Wageningen University & Research

FOREWARD

Agriculture contributed 21% of the GDP in Nigeria with the largest contribution from crop production, which covered 19 percent of the GDP. Agriculture account for a significant portion of Nigeria's GDP as a key activity for the country's economy after oil and provides a livelihood for many Nigerians, whereas the wealth generated by oil reaches a restricted share of people. Good quality seed of improved varieties reaching smallholder farmers can significantly improve the livelihoods of many small holder farmers in the country. Current adoption rates of improved varieties are at 11% for maize and only 3% for cowpea way below what could trigger significant agricultural growth in the country.

The seed sector in Nigeria is governed by the National Agricultural Seed Council (NASC) Act of 2019, the Plant Variety Protection Act of 2021, and the National Seed Policy of 2015 (FMARD, 2015). However, the seed sector in Nigeria faces many challenges, including access to high-quality seed in crop varieties, high cost of inputs, poor access to credit, inefficient fertilizer procurement and distribution, inadequate storage facilities, poor access to markets, counterfeit and fake seeds and poor farmers' awareness and use of seeds. In the area of seed supply, there is poor and inefficient enforcement of seed laws. All these factors and many more have resulted in a low productivity of 1.8 metric tons of cereals/ha relative to 4.9 t/ha and 4.2 t/ha in South Africa and Ethiopia respectively. This is due to continued usage of open pollinated variety (OPV) rather than improved hybrid seeds by the country's maize farmers. As a result, production is low and could barely satisfy the huge maize demand estimated at 12 – 15 MMT thereby creating a maize supply gap of nearly 4 MMT per annum. "This worrying trend can be reversed using technologies embodied in seeds which is a globally accepted to be the prime catalysts behind increases in crop yields and agricultural productivity world over.

The government of Nigeria with technical support from AGRA, recently conducted a thorough assessment of the country's seed system covering 8 components (i) Breeding variety release and maintenance (ii) Early generation seed production (iii) Quality commercial seed production (iv) Farmer awareness and participation (v) Seed marketing and distribution (vi) Quality assurance (vii) Policy, legal and regulatory environment (viii) National planning and coordination. The findings of the assessment on average place the seed system at 45% with the national planning and coordination component having the least score of 28% while policy, legal and regulatory frameworks scored highest at 68%.

The SeedSAT Analysis for Nigeria conducted in 2019 highlighted critical interventions in the area of national quality assurance (QA) as a concurrent high priority, improved seed system coordination mechanisms, supply of early generation seed driven by adequate data management and forecasting and lack of public and private investment. The commercial seed supply is hampered by lack of profitability and scalable private investment and there are nascent and weak seed distribution channels leads to poor access to improved/appropriate seed for small holder farmer. Other partners such as the Netherlands government have started to address some of the gaps through the Seed Strategy for NASC that was developed in 2020/2021 that is ending in 2024.

The Seed Sector Strategy and Investment Plan is informed by the results of the SeedSAT assessment together with key existing industry documents, namely the National Seed Roadmap and the NASC Strategic Plan. It highlights critical investment needs of the country considering some of the ongoing interventions. "The Seed Sector Strategy and Investment Plan proposes to achieve seed production targets for eight key crops important for food security and household incomes: maize, rice, sorghum, cowpea, soya bean, yam, groundnut and wheat. These targets range from 10% for groundnut to 70% for maize. Current certified seed production

only accounts for between 2% (for groundnut) and 50% (for maize) of the estimated annual requirement.

The total investment estimated to implement the Seed Sector Strategy is ₦2,484,715,000 (Two Billion, Four Hundred and Eighty-Four Million, Seven Hundred and Fifteen Thousand Naira, USD 5,765,000) and does not include the cost of interventions already funded under on-going projects. The 2 priority components garnering most of this investment are Breeding and Variety Release (34% of total budget) and Quality Assurance (31 %). The Strategy has extracted the top ten priority interventions from all the interventions being proposed. Of the total investment, the cost of implementing these top 10 interventions is USD 1,560,000 (One Million, Five Hundred Sixty Thousand US Dollars only), which is 27% of the total investment cost.

The government of Nigeria trusts that the private sector and donor organizations will rally behind this strategy and investment plan to help the government to strengthen the seed systems enabling access to quality improved seed for smallholder farmers to improve productivity productivity, food security and agro-industries as well as reduce the food import gap.



Senator Abubakar Kyari CON
Honourable Minister of Agriculture and Food Security
January, 2025

Vision and mission of the National Seed Strategy and Investment Plan

The overall vision of a healthy seed system is one in which farmers grow modern varieties of crops with product profiles that are responsive to market and consumer demands and are also adapted to their environments to ensure resilient and high yields. It is also a system that includes:

- A regular supply of domestically-bred and imported crop varieties at a pace that matches the market demand and that gives farmers choices;
- Healthy competition among public and private producers at the various stages of seed production, and who 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, and
- Seed subsidies (if used) are used carefully to temporarily bridge new market development and market failures for short periods of time,

This vision is reflected in the objectives of the National Seed Policy, which are to:

- Support and fast track varietal development, registration and release of new crop varieties as well as the rapid multiplication of released varieties;
- Improve the quality of seeds sold to farmers for higher yields and better incomes;
- Re-orient the operations of the public sector along commercial lines;
- Encourage private sector participation in seed operations through appropriate policies and promotional activities/ incentives;
- Promote technology and policy best practices in the global seed industry, and
- Maintain genetic biodiversity of the crop ecologies

Methodology

The development of the seed sector strategy was preceded by two broad 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, not duplicate, the information aggregated from existing resources and assessments, and adding additional subject matter expertise to help identify the root cause of deficiencies and inefficiencies and prioritize seed system modifications and investments with strong business cases to raise internal and external funding.

Stakeholder validation of SeedSAT country report: Following the completion of the assessments, the research teams, in collaboration with the government and the AGRA country office convened a workshop to validate the findings of the assessment. The stakeholders reviewed and critiqued the recommendations, the priority interventions and the proposed cost estimates.

The Seed Sector Strategy and Investment Plan is informed by the results of the SeedSAT assessment together with key existing industry documents, namely the National Seed

High-level Goals and Priority Targets

The National Agricultural Technology and Innovation Policy (2022-2025) is “articulated to unlock the country’s untapped potentials through the massive deployment of knowledge, technology and innovation in the agricultural sector to make Nigeria food and nutrition secure.” The Policy is implemented through 10 strategic components and 11 cross-cutting components, one of which is Access to quality agricultural inputs. Under this component, the Policy aims to promote the adoption of certified seed and strengthen and scale up the agricultural input distribution network. This Seed Strategy and Investment Plan proposes to achieve seed production targets for eight key crops important for food security and household incomes: maize, rice, sorghum, cowpea, soya bean, yam, groundnut and wheat. Table 1 below compares the seed production targets against the estimated annual seed requirement (calculated using seeding rate and area harvested to the different crops¹). The seed production targets for these crops range from 10% for groundnut to 70% for maize. Current certified seed production only accounts for between 2% (for groundnut) and 50% (for maize) of the estimated annual requirement.

Table 1: Seed production targets for 2025

Crop	Estimated annual seed requirement (in MT)	Production of certified seed ²	Seed production as % of estimated annual requirement	
			Actual in 2021	Target in 2025
Maize	125,575 ³	62,535	50%	70%
Rice	122,667	54,144	44%	60%
Sorghum	19,000	5,749	30%	40%
Soya bean	33,499	3,921	12%	25%
Cowpea	9,710	1,240	13%	20%
Groundnut	34,000	775	2%	10%
Yam				
Wheat	10,000 ⁴	1,103	11%	20%

Further, Table 2 shows ten high-level seed industry targets proposed by the Strategy to measure progress towards achieving the seed production targets in Table 1. The Strategy proposes to achieve these cross-cutting targets by 2025.



- 1 Calculated as product of area harvested and seeding rate, assuming replacement of seed every 3 seasons, except for maize. Data on area harvested sourced from FAOSTAT. Data on seeding rate obtained from SeedCo Growers Manual for maize, sorghum, soya bean, cowpea and groundnut; IRRI for rice.
- 2 Data for maize, rice, sorghum and soya bean from NASC; Data for groundnut, cowpea and cowpea from NASC Annual Report (2020)
- 3 Assumes 50% hybrid use (implying annual seed replacement), and 50% OPV use (implying replacement every 3 seasons)
- 4 Annual requirement from Wheat Farmers Association of Nigeria. Annual requirement of wheat crop is 1,000,000 MT, while seeding rate is 100kg per hectare

Table 2: High-level Seed Industry Targets by 2025

Priority intervention
Finalize efforts by NIRSAL, SEEDAN and NASC to develop financing models for seed companies and seed enterprises
Professionalize seed companies through a partnership between SEEDAN, NASC, and development partners to provide best-in-class support services in all areas of seed business management.
Strengthen agro-input (seed) distribution networks across the country
Finalize development of the Regulations to implement the PVP Act of 2021
Improve transparency and efficiency of the National Variety Release Committee
Strengthen SEEDAN as a platform for the private sector seed industry
Strengthen the existing National Seed Sector Platform
Upgrade two regional seed laboratories at Zaria and Ibadan
Conduct comprehensive training of staff involved in all aspects of QA at federal and regional levels
Develop pathway to rollout Seed Tracker and Seed Codex

Table 3: Top 10 Priority Interventions

High-level targets by 2025
At least 20 seed companies are accessing finance using the financing models
Due diligence in Quality assurance has been conducted in at least 15 seed companies, and the companies are addressing the gaps identified during the exercise
NASC has developed database and registered seed distributors across the country, according to agreed criteria for conduct of business as seed distributor or sales outlets
PVP Regulations have been gazetted by FMARD after substantive stakeholder participation & are being implemented
National Variety Registration and Release Committee is adequately funded and convenes at least one committee meeting annually
Strategic Plan for SEEDAN developed and validated by SEEDAN membership and is being implemented
Governance structure and operational modalities of the National Seed Sector Platform have been developed and adopted by the members of the platform
Equipment for the two regional seed labs has been procured, installed and is operational, in line with gaps identified in diagnostics assessment
At least 75% of the human resource capacity gaps and training needs in Quality Assurance are being addressed in line with the recommendations in the scoping study.
SeedTracker and SeedCodex have been successfully rolled out across the key cereal and legume crops



BACKGROUND - STATUS OF AGRICULTURE AND THE SEED SECTOR IN THE COUNTRY

The seed sector in Nigeria is governed by the National Agricultural Seed Council (NASC) Act of 2019, the Plant Variety Protection Act of 2021, and the National Seed Policy of 2015 (FMARD, 2015). In addition, the 2019 National Seed Roadmap for Nigeria (NASC, 2020) provides the framework and strategy for the growth of the formal seed sector. There are several key players in the seed sector in Nigeria, including:

- i) the National Agricultural Seed Council (NASC), a semi-autonomous agency of the Federal Ministry of Agriculture and Rural Development (FMARD), is responsible for regulating the seed industry in Nigeria;
- ii) the National Centre for Genetic Resources and Biotechnology (NACGRAB), which was established, in part, to conduct research, gather data and disseminate technological information on matters relating to genetic resource conservation and utilization.⁵ One of NACGRAB's core programs as stipulated in the National Crop Varieties and Livestock Breeds (Registration etc.) Decree No. 33 of 1987 is the servicing of the activities of the National Committee on naming, registration and release of Crop varieties, Livestock breed and Fisheries”;
- iii) National Agricultural Research Institutes (NARIs), centers of the Consultative Group on International Agricultural Research (CGIAR), universities and the private sector are responsible for variety research and development. In Nigeria, NARIs include the Institute for Agricultural Research (IAR), whose mandate is the genetic improvement of maize, cowpea, sorghum, cotton, sunflower and groundnut; the Institute of Agricultural Research and Training (IAR&T), whose mandate is genetic improvement of maize, kenaf, and jute; the National Cereals Research Institute (NCRI), whose mandate includes the genetic improvement of rice, and the Lake Chad Research Institute, whose mandate include genetic improvement of wheat, barley, and millet, among other cereal crops. NARIs and CGIAR centers (the International Institute for Tropical Agriculture - IITA, the International Crop Research Institute for the Semi-Arid Tropics -ICRISAT, and Africa Rice) work in close collaboration with Nigeria's universities, e.g., the Ahmadu Bello University, the Federal University of Agriculture, and the Obafemi Awolowo University, and
- iv) the Seed Entrepreneurs Association of Nigeria (SEEDAN), the umbrella body for seed companies and other key private seed sector players.

Component 1: National Agriculture Research and Breeding Effectiveness (NARS)

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 the need to embark on system changes that would improve the ability of the research system to generate and deliver these products efficiently, and in a timely manner. The main institutions involved in agricultural research and breeding of the main staple crops are the Institute for Agricultural Research (IAR), whose mandate is the genetic improvement of maize, cow-pea, sorghum, cotton, sunflower and groundnut; the Institute for Agricultural Research and Training (IAR&T), whose mandate also covers the genetic improvement of maize for the southern part of Nigeria; the National Cereals Research Institute (NCRI), whose mandate includes the genetic improvement of rice, among other cereal crops, and the National Root Crops Research Institute (NRCRI), which is responsible for the genetic improvement of root crops of economic importance, such as cassava, yam, and Irish potato. The vision of a healthy system includes the following:

Well-articulated and prioritized product profiles that are consistent with producer needs based on market surveys to guide the breeding program;

- Clear varietal pipeline management strategy;
- Research that is supported by a team of interdisciplinary scientists focused on the crop product profile;
- Provision of adequate budgetary support from the government or other potential sources;
- A program that works in tandem with downstream actors (such as EGS producers, extension and commercial producers, regulatory bodies, etc.) to assure proper hand-off and post-release support, and
- A focus on continual improvement (product replacement) and adaptation to the changing needs of farmers and markets.

Key challenges and gaps in National Agricultural Research and Breeding Effectiveness

Inconsistency in process and cost of variety registration and release: the National Crop Varieties and Livestock Breeds Registration and Release Committee, which is domiciled in the National Centre for Genetic Resources and Biotechnology (NACGRAB), is mandated to manage the process of variety registration and release. However, the process that breeders follow in practice is not consistent with the Guidelines for Registration and Release of New Crop Varieties in Nigeria 2016 developed by the NACGRAB. Further, these guidelines are not fully-consistent with the provisions of the NASC Act of 2019, and the ECOWAS Harmonized Seed Rules and Regulations, the latter of which has been domesticated in the NASC Act of 2019. In addition, the TASAI study for 2019 revealed that breeders from seed companies incurred higher costs in variety release than breeders from the public research institutes.

Inadequate capacity for production and maintenance of EGS: one of the challenges faced by public breeders is the insufficient infrastructure capacity to produce and maintain EGS for all the key crops. The capacity gap mainly pertains to infrastructure for seed production and storage.

Component 2: Early Generation Seed (EGS) Production and Distribution

Nigeria has a three-tier system of seed production and multiplication: breeder seed, foundation seed, and commercial or certified seed under the seed certification scheme. While early generation seed (EGS) systems and specific roles and responsibilities vary across different crops, some general themes resonate across crops. Early generation seed of publicly-bred varieties, comprising breeder and foundation seed, is produced by the national agricultural research centers, CGIAR centers, not-for-profit offshoots of CGIAR centers, and private seed companies. Historically, the National Seeds Service, under the NASC, was responsible for foundation seed production, but under the current National Seed Policy, foundation and certified seed production is led by the private sector. The NASC is now responsible for the supervision, monitoring, coordination, assurance of quality, and certification, including the licensing of private seed companies to produce foundation and certified seed.

Key challenges and gaps in Early Generation Seed Production and Distribution

Inconsistency in process and cost of variety registration and release: the National Crop Varieties and Livestock Breeds Registration and Release Committee, which is domiciled in the National Centre for Genetic Resources and Biotechnology (NACGRAB), is mandated to manage the process of variety registration and release. However, the process that breeders follow in practice is not consistent with the Guidelines for Registration and Release of New Crop Varieties in Nigeria 2016 developed by the NACGRAB. Further, these guidelines are not fully-consistent with the provisions of the NASC Act of 2019, and the ECOWAS Harmonized Seed Rules and Regulations, the latter of which has been domesticated in the NASC Act of 2019. In addition, the TASAI study for 2019 revealed that breeders from seed companies incurred higher costs in variety release than breeders from the public research institutes.

Inadequate capacity for production and maintenance of EGS: one of the challenges faced by public breeders is the insufficient infrastructure capacity to produce and maintain EGS for all the key crops. The capacity gap mainly pertains to infrastructure for seed production and storage.

- 1. Insufficient Funding for Public Institutions/Research:** While nominal funding for agricultural research has increased over the years, these increases have been small, and inadequacies remain. In 2017, studies placed Nigeria's agricultural research spend as a percentage of agricultural GDP at 0.35 percent, which is substantially lower than the intended 3 percent noted in the 2020 Agricultural Policy. Besides being inadequate, research funding Seed sector strategy & investment | Nigeria is largely irregular and frequently delayed, which makes it difficult for NARS to respond to market needs, and challenges the stability of long-term research for the development of new plant varieties and provision of EGS.
- 2. Lack of clear process to access basic seed from public research institutions:** The process for acquiring EGS is not streamlined, and, as a result, public research institutions sometimes do not provide sufficient EGS on time. This occurs even when contracts are in place. Public research institutions indicated that their seed production units lack sufficient funding to produce enough breeder seed or conduct EGS estimation ahead of production.
- 3. Lack of framework for licensing and royalties.** Licensing agreements can be used as vehicles to get more public varieties to farmers, and can involve licensing the rights to use a variety registration, to commercialize a variety or register a variety in the national or regional catalogue. Licenses can be a source of income to support public research institutions' breeding activities. There is need for framework to explain how the private sector can get into licensing agreements with public research institutions that would establish exclusive or nonexclusive rights to commercialize public varieties. Efforts are underway with support from the National Agricultural Seed Council, New Markets Lab, Syngenta Foundation, and the Agriculture Research Council of Nigeria to set up this framework.

- 4. Lack of framework for EGS demand forecasting:** The NASC has the mandate for national seed demand forecasting and seed production planning; however, its Seed Coordination and Management Services Department is not performing this function due to a confluence of technical, human capital, and financial resource constraints. Therefore, demand forecasting and production planning activities to coordinate across crops and institutions are non-existent. The NASC's Seed Information, Data Management and Capacity Building Department is also not providing real-time tracking and reporting of seed volumes (including EGS) produced, available, and demanded at a variety level. The NASC's ambition, as articulated in its five-year strategic plan, is to "drive seed production planning for the different classes of seed in Nigeria" by 2024.
- 5. Inadequacy of basic seed for seed companies:** Seed companies and producers mainly depend on public research organizations for access to quality EGS. This supply is constrained for seed of all food crops, except for foundation seed of Open Pollinated Varieties (OPVs) of maize. The constraints hampering EGS supply include: (i) the inadequate infrastructural and technical capacity of public research organizations for EGS production and supply; (ii) the limited technical, infrastructural and professional capacity of seed companies and seed producers, which does not allow them to assume responsibilities for EGS production; (iii) the limited human resource and infrastructural capacity of the NASC, which limits its performance of EGS certification across the nation; (iv) the ineffective and non-transparent processes for EGS supply and linkages between public and private stakeholders, and (v) the absence of an EGS forecasting system critical for planning its supply.

Component 3: Commercial Seed Production and Distribution (CP&D)

Certified seed of improved staple food crop varieties in low-income countries often holds a total market share of 10-25 percent because of the reuse of open-pollinated and self-pollinating varieties by farmers, with hybrid maize being the exception. The recycling of seed leads to a decline in the vigor and genetic drift that limits the upper bound of productivity that farmers can achieve. A healthy seed system that can redress these issues can be envisioned as one in which the seed production and distribution system includes the following:

Key challenges and gaps in Early Generation Seed Production and Distribution

Inconsistency in process and cost of variety registration and release: the National Crop Varieties and Livestock Breeds Registration and Release Committee, which is domiciled in the National Centre for Genetic Resources and Biotechnology (NACGRAB), is mandated to manage the process of variety registration and release. However, the process that breeders follow in practice is not consistent with the Guidelines for Registration and Release of New Crop Varieties in Nigeria 2016 developed by the NACGRAB. Further, these guidelines are not fully-consistent with the provisions of the NASC Act of 2019, and the ECOWAS Harmonized Seed Rules and Regulations, the latter of which has been domesticated in the NASC Act of 2019. In addition, the TASAI study for 2019 revealed that breeders from seed companies incurred higher costs in variety release than breeders from the public research institutes.

Inadequate capacity for production and maintenance of EGS: one of the challenges faced by public breeders is the insufficient infrastructure capacity to produce and maintain EGS for all the key crops. The capacity gap mainly pertains to infrastructure for seed production and storage.

- 1. Reliance on government institutions as key buyers of seed:** On aggregate, close to 50 percent of the certified seed for rice and maize was sold to institutional buyers. The main institutional buyers are the federal and state ministries of agriculture. Other institutions and programs that procure seed include Fadama, the NIRSAL, and the Central Bank of Nigeria. The heavy reliance on these buyers may present a problem if these entities change their focus from seed production to other agricultural activities.
- 2. Over emphasis on production of maize and rice seed.** The combined production of OPV maize, lowland rice, and hybrid maize was nearly 87 percent of the total certified seed production in Nigeria for 2019. In addition, seed production for yam, cassava and cowpea was supported by donor-funded projects. This situation indicates an inadequate focus on other important food security crops, especially once the donor-funded projects close.
- 3. Inadequate capacity of some seed companies:** Many seed companies are very small. Out of the 305 registered seed companies, 103 produced less than 200Mt of either rice or maize seed in 2021. Most of the small seed companies do not have the capacity to adhere to NASC's requirements for quality assurance. For example, they process the seed manually, leading to poor quality seed in the market. In 2020, NASC deregistered about 100 seed companies that did not meet the requirements for participation in the seed business.

Component 4: National Policy, Legal and Regulatory Framework (PLR)

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

Key challenges and gaps in PLR in Nigeria

- 1. Finalize the drafting of the Regulations to implement the PVP Act:** The PVP Act was passed in 2021 to protect plant varieties, encourage investment in plant breeding and crop variety development, and establish a Plant Variety Protection Office. The law is expected to benefit the seed sector by establishing a legal channel to protect breeders of both private and public varieties, with protection extended as varieties enter the market or are traded regionally. The next step is to implement the PVP Act through the development of PVP Regulations. The Regulations would outline the operational guidelines to enforce the clauses in the Act, including the process to establish the PVP Office. This work is ongoing and needs to be finalized.
- 2. Possible institutional issues in variety registration and release:** The NASC Act establishes the new Seed Registration and Release Subcommittee, which appears to have overlapping functions with the National Crop Varieties Registration and Release Committee (NVRC) and the Technical Sub-committee on Crops based on the still applicable 2016 Guidelines on Registration and Release of New Crop Varieties in Nigeria. The NASC Act also mandates that the Minister of Agriculture and Rural Development approves procedures for registration of new varieties in the National Crop Varieties Release Catalogue, on the advice of NASC. This would overlap with the role that the NACGRAB Registrar is currently playing. The existence of duplicative institutions and roles creates uncertainty in the variety release and registration process. There is a need to develop the NASC Regulations to clarify the roles and responsibilities of the institutions responsible for the function of variety release and registration.
- 3. Insufficient funding for national variety release committee meetings:** According to the Guidelines for Registration and Release of New Crop Varieties in Nigeria 2016 developed by NACGRAB regarding variety release and registration, the NVRC must meet at least twice a year. Stakeholders noted, however, that is not typically the case due to insufficient funding, which creates delays in the release of quality varieties. For example, stakeholder consultations revealed that in 2019 and 2020, the NVRC only sat once. There is a need to increase the funding to NVRC. Further, the NASC Regulations should outline the funding arrangements for the NVRC.
- 4. Absence of a binding regulatory framework on certification:** There are currently no regulations under the NASC Act to operationalize provisions on certification. The 2017 NASC Guidelines for Registration of Seed Producers or Companies and Seed Fields in Nigeria continue to apply but are not binding and are based on a repealed law. There is a need to develop clear procedures for the certification process in the NASC Regulations.
- 5. Unpredictability of import permitting process:** According to the NASC Act, a seed importer seeking an import permit should be able to apply to the NASC and follow prescribed procedures and fees. Notably, regulations are yet to be enacted under the NASC Act to provide the forms and procedures to be followed during seed importation. In the mean-

time, the NASC describes the importation procedures on its website, which is a guiding framework rather than a binding legal structure. Stakeholders also noted that it usually takes significant time to acquire an import permit, even when the application is in order. The TASA Nigeria report cites that it can take up to between two weeks to a month (or even up to six months without diligent follow up) instead of the five days denoted by the NASC website.

- 6. Inconsistent application of ECOWAS rules:** The NASC Act aligns Nigeria's seed regulation with ECOWAS seed rules, including on variety release and registration procedures, certification, and import and export. However, stakeholders noted that, while this is the case on paper, the practice is quite different. For instance, (i) under the ECOWAS Seed Regulations, any variety entered in the national catalogue of a Member State should be included in the West African Catalogue of Plant Species and Varieties and can be traded freely throughout the ECOWAS region. Seed companies noted that, in practice, however, varieties that are registered in other ECOWAS Member States' national catalogues and listed in the West African Catalogue of Plant Species and Varieties still require retesting to evaluate their compatibility with Nigerian agro-ecological conditions, contrary to the ECOWAS seed rules; (ii) Some DUS and VCU testing protocols are not aligned with the 2008 ECOWAS Procedure Manual for Variety Registration in the National Catalogue for Crop Species and Varieties in West African Countries, and (iii) stakeholders reported bureaucratic challenges when importing varieties registered in other ECOWAS Member States even when listed in the West African Seed Catalogue.
- 7. Insufficient implementation of anti-counterfeiting measures:** Under the NASC Act, anyone convicted of a counterfeiting offence is subject to imprisonment for up to one year or a fine of up to 1 million naira (or both) for a first-time offender, and imprisonment for up to two years or a fine of up to 2 million naira (or both) for a multiple offender. Private sector stakeholders noted that, while the penalties have been strengthened under the NASC Act, there have not been any reported prosecutions, and counterfeit seed continues to be a major challenge.

Component 5: National Seed Quality Assurance (QA)

National governments want to ensure that farmers are receiving high quality seed from the formal sector, yet often do not: 1) have proper quality assurance regulations in place, and/or 2) implement or assure implementation of their existing quality assurance regulations well, resulting in low quality seed for farmers. A healthy seed system is one in which farmers have confidence that the certified seed meets labeled quality standards, and actively patronize the brands with the highest quality seed of the varieties they want to plant; and one in which seed companies work to exceed quality standards and view the regulator as their partner in this quest.

Key gaps and challenges in Quality Assurance

- 1. Lack of adequate capacity within NASC:** Quality Assurance (QA) is the mandate of the National Agricultural Seed Council (NASC). However, the NASC is constrained by inadequate resources to fulfill its mandate. There is a need to assess the NASC's specific human resource capacity needs and then provide the funds to address them.
- 2. Lack of ISTA-accredited labs:** There is no ISTA accredited lab and existing labs have substantial inadequacies such as lack of, or poor equipment, poor infrastructure and storage, and, inadequate technical capacity.
- 3. Lack of QA for roots and tubers:** At present, the only scientifically rigorous quality control work undertaken for root and tuber crops is through initiatives such as the Building a Sustainable, Integrated Seed System for Cassava in Nigeria (BASICS) project. Under this project, the International Institute of Tropical Agriculture (IITA) has provided extensive support to outfit the National Center for Genetic Resources and Biotechnology (NACGRAB) laboratory in Ibadan for project-related quality control. Based on the laboratory's quality control work, the planting material is certified by the NASC, but issues such as how to label the planting material are still being worked out. The BASICS initiative has developed a field activity and inspection IT tool (Seed Tracker), and interacted extensively with the NASC to discuss how to expand quality control and QA activities conducted under the BASICS project to a broader geography, and a wider set of crops. To date, the BASICS quality control and QA activity has not been sustainably expanded beyond the project volume, but valuable lessons have been learned and important initial steps taken.
- 4. Additional QA functions need to be in place for ICT solutions (Seed Tracker and SeedCodex) to be more effective.** The accuracy, efficiency, and transparency of QA are all strengthened by the appropriate and sustainable use of IT tools. The NASC has already selected the SeedTracker (developed by IITA) and SeedCodex tools to provide digitized support for field QA operations and certified seed authentication, respectively. However, there is a need for additional technical vetting if the rollout and desired implementation of the two tools is to be successful and achieve the desired results. In addition, technical IT capacity building, with respect to hardware, software, project management, data capture and analysis, user interface, and more, appears to be needed.

Examples of issues that appear to require additional planning and implementation to ensure effective implementation are: (i) Seed Tracker usefulness for full certification decision-making, including interface with lab test results; (ii) Seed Tracker interface with payment and accounting modules; (iii) Effective Seed Tracker expansion beyond cassava, for certification purposes; (iv) SeedCodex labeling design and feasibility, as they relate to company compliance with labeling content; (v) SeedCodex link with QA seed lot numbering for traceability; (vi) SeedCodex pace of uptake with seed companies, and possible challenges and solutions. In addition, it is important that the NASC has internal project management and technical capacity in place to fully underpin QA activities.

- 5. Lack of effective Quality Assurance activities at agrodealers and other seed distribution points:** Best practices related to protecting and ensuring seed quality at distribution points, and supporting seed distributors to understand and engage in these practices, are broadly

related to: i) registering and tracking qualified distributors; ii) ensuring valid supply chains, including appropriate labeling; iii) identifying and penalizing distributors that adulterate seed; iv) ensuring that carryover stock is returned to seed companies for retesting versus being sold without retesting and relabeling, and v) verifying good distributor storage conditions that are free of weevils and have appropriate temperature and humidity conditions. The NASC has already identified QA improvements at agrodealer and other distribution points as an important priority. However, effective planning and implementation is yet to be done. This effort can be supported by sharing information on best practices in other seed systems, in addition to coaching NASC staff on best practices in implementation, record-keeping, and the management of non-adherence to QA standards.

- 6. Lack of funding for Quality Assurance activities.** The poor status of seed laboratories and equipment indicates severe underfunding, as does the lack of training, vehicles, and support for inspector facilitation. The NASC and the Nigeria Agricultural Quarantine Service (NAQS) charge for services offered but the fee and/or collection levels are reported to be inadequate. Seed companies reported that the NASC staff lack resources to do their job well and most seed producers recommended enhanced capacity for NASC to undertake certification services in terms of increasing the personnel numbers as well as training to handle different crops. There is also a need for certification officers to be facilitated (with vehicles and funds) to avoid being compromised by seed companies. There are issues of balancing funding where needed — for example, Zaria does the most testing but has relatively fewer staff while many other labs are overstaffed given the volume of tests conducted. Also, worth noting is that fees paid for government services go to the general government's treasury when collected via the e-payment system.
- 7. Lack of regulations and enforcement for QA, including anti-counterfeiting measures:** This constraint was also highlighted under PLR and NPC. Based on stakeholder feedback, the assessment found that there is no effective implementation of QA activities for seed storage, carryover and retesting; there is no effective verification of proper disposal of obsolete and/or low-quality seed, and that while the certification agency has a de-facto plan to combat the sale of fake and low-quality seed, the efforts are, rarely effective at combating the overall problem. Both farmers and agrodealers reported dissatisfaction with the government's efforts to prevent the sale of counterfeit and low-quality seed. The roll-out of the SeedCodex feature on seed packets is meant to combat counterfeit seed but is currently not fully utilized or functional. Most farmers and agrodealers are not yet trained in use of SeedCodex. There have been some random searches of agrodealer shops by the Seed Inspectorate Unit to establish if seed sold is certified and in sealed packages, which is a positive sign, although it is reportedly rare that someone is prosecuted.
- 8. Inadequate farmer awareness of SEEDCODEX and SEED Tracker:** These two initiatives are implemented by the NASC. However, their success is constrained by the lack of awareness among the farmers who are the main beneficiaries.

Component 6: National Planning and Coordination (NPC)

Under the CAADP Malabo agreement, African nations have committed to making public investments equal to 10 percent of the Agriculture GDP to achieve agricultural transformation, with an 8 percent annual sector growth rate. The translation of these political commitments into policy, and strategy into seed plans and operations is expected to lead to the clear identification of roles and responsibilities and improvement in public, private, and development partner annual planning and coordination. The vision of a healthy system is one in which there is better planning and coordination to support the continuous improvement of the supply of quality seed of crop varieties that improve productivity and respond to the demand of both farmers and end users of crops. The more that planning and coordination is based on shared knowledge and understanding of farmer and end-market crop demand, the more likely it is that quality seed supply will be organized to meet the demand.

The assessment of the national planning and coordination thematic platform is based on four themes: the clarity of the national seed strategy; the strength of the public-private joint effort for seed sector planning; the strength of the public-private joint effort for seed sector coordination; and, if applicable, the effectiveness and efficiency of subsidies.

Key gaps and challenges in National Planning and Coordination in Nigeria

- 1. Annual budgets fall far short of high-level planning commitments to fund agricultural development:** The national budget allocation to the agriculture sector stagnated between 1.0% and 2.0% from 2017 to 2020. The commitments are not consistent with Nigeria's high-level commitments to the Comprehensive African Agricultural Development Programme (CAADP). Interviewees from public institutions noted that, while the FMARD's departments and agencies rank collectively as one of the largest recipients of recurrent budgetary allocation, the allocations to research and development, EGS production, regulatory agencies, and the promotion of new crop varieties have suffered from underfunding.
- 2. Delayed annual cash flow to public institutions affects performance:** Public institutions reported that the cash releases against their allocated budgets arrived late relative to the agriculture season. Cash can only be re-leased upon the National Assembly's approval of the budget, which should occur in December of the prior fiscal year or January of the current fiscal year. Over the past four years, the National Assembly approval for budgets was given in mid-year of the current fiscal year with interviewees indicating that funding released as cash was too slow. The late arrival of cash meant that trials, breeder seed plots, and national performance trials were planted late or had to be deferred. Slowed cash flow on top of budget reductions translated into lower regulatory enforcement capacity.
- 3. Weak coordination mechanisms reinforce disconnects around incentives and interests across institutions, companies, and donors:** Weak coordination mechanisms partly stem from lack of funding for staffing and public extension programs, poor implementation of inclusive public/private planning meetings, and a general decline in support for seed organizing committees. National coordination mechanisms and platforms exist but still face challenges in effectiveness and inclusiveness. The NASC has clear responsibility for seed sector coordination from research, through all classes of quality assured seed, varietal promotion, licensing of seed businesses, industry and market development, seed trade, and administration of elements of subsidy programs. The National Seed Road Map (NSRM) and the NASC 2020-2025 strategy recognize that funding falls short of requirements to staff, and support for NASC operations is required to reach the needed standard. In addition, linkages to public extension are perceived as weak by the research institutions and seed producers, given the high household to extension officer ratio, the breadth of extension worker responsibilities, and low funding. Some seed companies have started their own combined extension/marketing agent services.

4. **Inadequate and inaccurate seed demand and supply information constrains planning, budgeting, and coordination:** One of NASC's core roles in the National Seed Policy is to establish and maintain a system for collecting and disseminate data on seed use, planned needs and seed availability to support decision-making by seed suppliers and users. However, the NASC faces challenges trying to develop a strong information base on seed demand and supply across the major cereal and legume food crops and vegetatively propagated crops. Improvements in data collection, management and forecast modeling is needed to help bridge the gaps and reduce counterfeit seed.
5. **The National seed trade association, SEEDAN, while a strong advocate for private seed company policy initiatives, lacks regional and commodity working group representation.** SEEDAN represents the private seed industry in Nigeria. It was established in 1992 and formally registered with the Corporate Affairs Commission in 2008. Since its inception, it has maintained a strong focus on promoting and advocating for the Nigerian private seed companies that are active in crop seed breeding, production, marketing, and distribution. Its core membership comes from companies that are focused on cereals, legumes and vegetables. Interviews conducted as part of TASAI research reveal a need for SEEDAN to improve its communication and transparency in governance, with concerns about slow turnover in leadership (elections are held every 5 years) and the need to increase SEEDAN's information transparency and its influence on seed sector issues.
6. **National government programs, projects, and NGOs continue to dominate the seed system, thereby distorting market-oriented development:** National government programs and projects include input subsidy programs and schemes to improve access to credit. National subsidy program rationales are based on seed supply to increase productivity and income in targeted groups and zones. Subsidy implementation approaches are viewed by seed producers as too skewed by top-down initiatives that diverge from the more market-oriented approaches that would help define an exit strategy. The seed producers generally see the Anchor Borrower Program as supportive of the development of the seed market but have concerns with the timeliness of payment and process for adjudicating the payment disputes that leave seed companies heavily indebted to national and state governments and agencies. By 2020, the Nigerian House of Representatives, was getting concerned about the reported levels of non-repayment of loans issued under the Anchor Borrower Programme. The Central Bank of Nigeria had set a capital ceiling of 104 billion Naira with about 86 billion Naira (83.1 percent) disbursed as loans, but only 5 billion Naira (5.92 percent) was repaid. All of this means the program is not self-sustaining. Seed relief, NGO project and emergency seed programs provide a major market for certified seeds – about 47 percent according to the TASAI 2019 survey, but their timing and procurement practices are seen by seed companies as providing an incentive for the supply of low quality, counterfeit seed. However, sixty percent of agrodealers surveyed expected that their cash sales to farmers and cooperatives would decrease over one or two years without the support provided by these programs or individual projects.

Component 1: National Agriculture Research and Breeding Effectiveness (NARS)

- 1. Assess the efficiency, transparency, and cost-effectiveness of the current system of variety registration and release** as compared to other countries, and to ECOWAS seed regulations. Thereafter, propose a strategy for strengthening and/or simplifying the variety release system, considering an exemption for specific crops (vegetables) and support for third-party variety testing. The need for a clear separation of variety release and variety development processes and activities, and the support for a clear procedure manual for variety release in line with the ECOWAS draft procedure. The procedure or guidelines should also create room for the removal of the monopoly of the public breeding institutions in the submission of candidates for release, and encourage private sector release by introducing clear procedures for the private release of varieties.
- 2. Support the enforcement of the ECOWAS seed regulations** to ensure easy access to regional markets for Nigerian companies, and encourage the introduction of new varieties of international companies into Nigeria.
- 3. Strengthen the infrastructural and human resource capacities of NARIs** with crop mandates for variety trial implementation.
- 4. Ensure easy access to an updated national variety catalogue** that also allows farmers to select varieties matching their agro-ecology, farming systems and market demands (through the seed tracker).

Component 2: Early Generation Seed Production and Distribution (EGS)

- 1. Assess the effectiveness of the national breeding programs using the Breeding Program Assessment Tool (BPAT):** The National Cereal Research Institute (NCRI), Institute for Agricultural Research (IAR), Institute of Agricultural Research and Training (IART), National Root Crops Research Institute (NRCRI), Lake Chad Research Institutes (LCRI), and relevant Universities have responsibilities for genetic improvement for the main food crops in Nigeria. The first task would be to assess the specific capacity needs of each research center, using the BPAT tool. The tool has already been used by Africa Rice in Nigeria, and can now be applied to the other research institutions. The assessment would identify the specific human resource and infrastructure capacity gaps in each research institution as well as the pathway to address these gaps in a systematic way, and the requisite investments to respond to each gap. There would be a need to identify the appropriate entity to conduct the BPAT assessments.
- 2. Develop the framework for licensing varieties to the private sector:** The Agricultural Research Council of Nigeria, in collaboration with New Markets Lab and Syngenta Foundation, intends to commence work leading to the development of a framework for seed companies to access newly released crop varieties through licensing agreements. This work should be finalized and then implemented. The implementation includes the capacity of the research institutions to monitor these licensing agreements.
- 3. Strengthen NASC capacity in seed information management and production planning** to conduct the following tasks: (i) demand forecasting for all classes of seed, including the EGS classes, to determine the seasonal requirements for the different categories of buyers, and

(ii) maintaining an accurate database of available and projected seed production volumes for the different seed classes.

- 4. Design and support the implementation of specialized business models and/or PPPs,** involving critical public and private stakeholders for EGS production and supply, with specialization for maize hybrids and OPVs, other major cereals, small grains, legumes, roots, tubers and bananas (RTB)s, and indigenous vegetables, including tailored human capacity development.

Component 3: Commercial Seed Production and Distribution (CP&D)

- 1. Finalize efforts to avail financial support services to seed companies and seed enterprises.** NIRSAL is working with SEEDAN and NASC to develop the financing models for actors along the seed value chain. This effort should be finalized.
- 2. Avail irrigable land with sufficient isolation** distances to commercial seed companies and out growers at preferential lease terms. This would allow the companies and seed enterprises to expand their production capacity.
- 3. Professionalize seed companies** through a partnership between SEEDAN, NASC, and development partners to provide best-in-class support services in all areas of seed business management.
- 4. Strengthen the capacity of agrodealers** through partnerships with private agro-input providers, seed companies, state-level ministries, and development actors to increase farmers' access to quality agricultural inputs and agricultural extension advisory services.

Component 4: Policy, Legal and Regulatory Framework

- 1. Develop Regulations Under the NASC Act.** Regulations are needed under the NASC Act to address several gaps including: (i) streamlining the process for variety release and registration, both clarifying institutional frameworks and roles, (ii) fully aligning Nigeria's system with ECOWAS seed rules, (iii) streamlining the procedures on certification; in this regard, regulations should incorporate and reference the NASC certification guidelines to make them binding, (iv) clarifying the procedures for import and export, and (v) clarifying the NASC's roles related to the enforcement of anti-counterfeit activities in the industry. Some of these specific actions are being implemented.
- 2. Conduct stakeholder awareness of the NASC Regulations after they have been developed and gazetted.** The stakeholders would need to understand the processes and procedures as outlined in the Regulations so that they can adhere to them.
- 3. Develop PVP Regulations and Establish the Relevant Institutional Framework.** The PVP Regulations (and procedural guidelines) would explain the operational and implementation arrangements to implement the PVP Act.
- 4. Develop and Implement Funding Options for the NASC,** including funding for the NVRC. The NASC should finalize the operational modalities for the NASC fund, and then work to ensure that the Fund is adequately resourced.

Component 5: National Quality Assurance

1. **Finalize efforts to avail financial support services to seed companies and seed enterprises.** NIRSAL is working with SEEDAN and NASC to develop the financing models for actors along the seed value chain. This effort should be finalized.
2. **Avail irrigable land with sufficient isolation** distances to commercial seed companies and out growers at preferential lease terms. This would allow the companies and seed enterprises to expand their production capacity.
3. **Professionalize seed companies** through a partnership between SEEDAN, NASC, and development partners to provide best-in-class support services in all areas of seed business management.
4. **Strengthen the capacity of agrodealers** through partnerships with private agro-input providers, seed companies, state-level ministries, and development actors to increase farmers' access to quality agricultural inputs and agricultural extension advisory services.

Component 5: Policy, Legal and Regulatory Framework

1. **Upgrade two regional labs to basic levels of functionality and the federal seed quality and phytosanitary labs to ISTA standards:** Undertake a scoping study led by a highly competent Quality Assurance technical team to specify in detail what needs to be done to bring Nigeria's essential QA processes and procedures up to ISTA-accreditation standards at the two national laboratories (for seed quality and phytosanitary), and to basic, reliable testing standards at the Zaria and Ibadan field offices. Each location has a different starting point, but all need meaningful improvements. These locations are recommended due to their importance in seed production. However, they can also provide upgrades and training experience for laboratory strengthening in other areas of the country.
2. **Align QA and field office staff with QA needs and deliver comprehensive training for QA staff:** Once the scoping study and procurement plans are in place to upgrade the labs then: 1) review staffing numbers and skill needs at all locations, and reassign staffing to meet, but not excessively exceed, QA requirements including near-term anticipated requirements; and 2) design and carry out training programs for both federal and regional QA staff to ensure appropriate procedures are followed for all QA activities, and that all staff assigned to perform QA activities have the requisite training. Training should be developed to cover all functional areas of QA, including registering growers and grower fields, sampling, sample intake, sample storage and disposal, testing, analysis, record-keeping, equipment maintenance and calibration, auditing, and communication with service users. In addition, training to contribute to user knowledge and improvement will be important, as will be training on basic computer skills such as Excel usage. Staff assignment planning should also include planning for career paths, continued education, rotational assignments, and preparation for future responsibilities such as auditing of third-party inspectors, and coordinating the development and oversight of e-certification.
3. **Develop pathways to implement the rollout of SeedTracker and SeedCodex:** While some initial steps have been taken, more work needs to be done to scope, plan for, and implement the internal NASC IT capacity needed to effectively implement QA activities. The recommendation is to contract technical expertise to work with NASC to address the issues highlighted above, covering both internal NASC IT capacity, and the effective use of both Seed Tracker and SeedCodex as potentially important support tools for QA in Nigeria.
4. **Develop capacity for effective QA activities at agrodealers and other seed distribution points:** The recommendation is to support NASC planning and implementation efforts by availing qualified technical support to the NASC team to develop an initial plan and to provide implementation coaching as needed. It is assumed that staffing costs and "post-pilot" travel costs will be covered by the NASC, that seed testing costs will be provided on a pro bono basis by NASC laboratories, and that IT equipment needed will be covered under recommendation #5.

- 5. Establish an SMS-based farmer feedback loop (FFL) to empower farmers to raise issues when fake or low-quality seed is purchased:** The most critical element of any quality assurance system is the end user, yet for seed quality assurance this is often forgotten or willfully overlooked. Farmer feedback with respect to seed quality is an essential part of ensuring that all parties are fulfilling their obligations.

Component 6: National Planning and Coordination (NPC)

- 1. Improve advocacy to increase Nigeria's public budgetary commitments to agriculture** from its current 2 percent to the 5-6 percent levels of 6-8 years ago: Work to improve prioritization and coordination of funding for agriculture so that it is better balanced between production, research and development, early generation seed production, and the regulatory agencies that maintain input quality and agricultural health. This recommendation needs to be supported by the development of a strong value-added case for the impact of increased public funding of agriculture to both recover from the COVID-19 pandemic and to improve GDP by leveraging greater private sector and smallholder investment and operating response. There should be a corollary case for the impact of increased and sustained funding for core seed system public institutions (ARCN, NARIs, NASC, NAQS) for at least the period of the new National Agricultural Technology and Innovation Plan 2020-2023. The funding is needed to structure the licensing, royalties, contracting, and service/user fee revenue streams now authorized under the new PVP and NASC Acts. The CBN, NIRSAL, SEEDAN, farmer and commodity associations could be natural allies for advocacy, with support from the portfolios of the Agricultural Donor Working Group. A potential focal point for the effort would be the Nigerian Economic Summit Group (NESG), which is a non-profit private sector think-tank with the mandate to promote economic reforms in Nigeria. The NESG already has an established working relationship with AGRA, in the Farm Pain to Farm Gain effort.
- 2. Improve cost accounting and budget allocation practices such that relevant program costs (personnel, operations, maintenance, and capital) align and the programs are effective:** A stronger, evidence-based case is needed to demonstrate that the public seed system institutions have prioritized program needs and are managing available resources efficiently, and that public resources are concentrated on public good generation and regulatory roles. Operations and maintenance budgets need to move into the recurrent budgets instead of being characterized as assets, or as projects. This recommendation may include the following activities:
- a) Provide accounting and financial management assistance to the NASC and to NARIs to improve their enterprise and activity cost accounting and budgeting for operations, including transport, facilities and equipment maintenance, and communications.
 - b) Improve and implement sustainable funding plans for QA operating and capital expenditure.
- 3. Support establishment of the Nigeria Seed Sector Development Fund (NSSDF):** The 2019 NASC Act provides for the establishment of a seed fund to defray the costs of NASC operations. The NASC Strategic Plan includes an outline of funding needs by areas of NASC responsibility, and their corresponding potential income and bridge funding sources, but these need to be detailed and concrete steps taken to mobilize them. Support is needed to design the fund, its operations, and a pathway to sustainability that combines public budget allocations, service fees that can be retained, and development partner and industry contributions for joint activities. Design considerations include: benchmarking the fund structures of other industries and countries including capital investment and operating expenditures; fee schedules for regulatory and seed industry development services; the development of clear payment flows for NASC-provided seed services; establishment of accounting, financial control, and management and reporting; medium-term planning for expenditures not covered by service fees and estimation of bridge funding requirements while fee collection is scaling, and the development of memoranda of understanding and standard provisions for contracts and collaborative grants.

- 4. Facilitate strong, multi-stakeholder engagement in the diagnostics and design of the planned NASC seed information one-stop shop,** with the full incorporation of NAQS seed import and export data. This initiative is to be built on a good understanding of current seed information flows along the seed value chain such that the new entity can aggregate current information on production and storage location for all classes of certified seed based on production and sales/distribution data across research institutions, seed companies, NGOs, and crop development and support programs. This effort will require development partner assistance to help underwrite federal, state, company, research institute, and NGO consultations to establish and operationalize the planned NASC seed information one-stop shop. The planning should include a systems analysis of current data collection, aggregation, analysis and reporting for national production (breeder-foundation, certified, and quality declared seed classes along with inspection and seed testing data) and seed importation and exportation, with the integration of NAQS phytosanitary certification for exports, and regulatory inspections and testing of imported seed. Co-investment is needed to expand the Seed Tracker effort to bring data on seed availability together in a single, transparent, and online database for certified seed production and marketing. The system will also need to cross-link to the Seed Codex. A Reinforcement of Seed Information, Data Management and Capacity Building Department is needed, and users will need training as the information system elements are developed and rolled out through the NASC portal.
- 5. Strengthen the functioning of the newly established National Seed Sector Platform:** The NASC, together with several other partners, established the National Seed Sector Platform under the Collaborative Seed Program. There is a need to strengthen the platform to ensure regular, two-way dialogue between the public and private sectors and development partners in Nigeria's seed industry. A fully functional platform would strengthen the degree of collaboration in the planning, execution and monitoring of projects and investments in the seed sector.
- 6. Strengthen SEEDAN as platform for private sector representation in the seed industry:** The SEEDAN is essential to private seed industry advocacy on policy and regulatory issues, representation in public-private planning and coordination, and the development of member company capacity. Currently, it is supported by members and development partners across these areas. However, there is a need to strengthen the SEEDAN's management and secretariat in its role of implementing the association's day-to-day activities, strengthen its governance structures, improve efforts for membership outreach, and sustain its engagements with government agencies and development partners on all matters related to seed sector development.
- 7. Strengthen the prioritization of public sector crop-specific interventions and investments using the seed archetype sliding scale of public and private roles:** The public, private, and NGO sector engagement with seed system planning and coordination is complex because of the size and diversity of Nigeria's agriculture sector. Public investment resources are limited and have declined over the past several years; therefore, it is important that public investment is prioritized for interventions that are particularly risky and/or private sector is unwilling or unable to invest in. At the same time, it is necessary to expand the role of the private sector in seed production and distribution when commercially feasible, and when the private sector can deliver and distribute certified seed more efficiently than the public sector. The optic of seed systems archetypes based on relative profit and demand for different crops can be used to prioritize roles between the public and private sector, and develop supporting intervention and investment programs. This can be used when there is good data on the strength of demand for seed, when there is good information on the profitability of seed production and distribution, and when there is solid information on the relative costs of building public sector assets or incentivizing private sector investments.

RESULTS FRAMEWORK

The results framework is a description of the results that should be targeted under each strategic intervention in the different thematic areas.

Table 4: Results Framework

Component 1: Breeding			
Strategic Intervention	Specific Action	Proposed Target Result(s)	Proposed Target Year of Achievement of Result
Assess the efficiency, transparency, and cost-effectiveness of the current system of variety registration and release	Assessment of the current variety release system	The NASC and NACGRAB have defined roles and disseminated <ul style="list-style-type: none"> A standard cost structure for variety release system, Guidelines for the variety release process 	Year 1
Strengthen the infrastructural capacity at the NARIs	Assess current infrastructural capacity of each NARI using Breeding Performance Assessment Tool (BPAT) tool: This task can be done by ARCN and/ or other capable entities	<ul style="list-style-type: none"> Desired traits are known for priority crops Trait-based breeding strategy document prepared 	Year 1
	Implement the recommendations of the BPAT assessment to address the infrastructure gaps within the research institutions	NARIs have well-developed irrigation facilities for phenotyping	Year 2
		NARIs have modern screen houses and associated equipment	Year 2 & 3
		NARIs have well equipped molecular laboratories for genotyping that will fast track breeding procedures	Year 2 & 3
Strengthened the human resources capacity of the NARIs	(The first task is an assessment of the human resource capacity needs of the NARIs. This will have been done using the BPAT tool above). Support the training and re-training of breeders (seed scientists and other support staff) on modern breeding techniques and analytical tools.	Breeders in the key NARIs have been trained on modern breeding techniques	Year 1 & 2
	Encourage youths to take plant breeding as course through provision of Scholarships and grants.	At least 10 scholarships available for students in plant breeding, seed technology courses	Year 4
	Engagement (Recruitment) of more breeders, seed scientist, licensing experts to NARIs	Breeders and seed experts have been hired in response to capacity gaps identified in the BPAT assessment	Year 3 & 4
Component 2 – Early Generation Seed Production and Distribution			
Strategic Intervention	Specific Action	Proposed Target Result(s)	Proposed Target Year of Achievement of Result
Develop the framework for commercialization of public varieties through licensing and royalty payments	<ul style="list-style-type: none"> The NASC to work with ARCN to develop frameworks for the commercialization of varieties by national research institutions. Convene meetings to explain the framework to the seed companies, seed enterprises and research institutions 	Research institutions have developed a framework for licensing public varieties to seed companies	Year 1
		50% of commercialized public varieties have been licensed to seed companies under the licensing framework	Year 3
		Research institutions in collaboration with NASC have institutionalized a system to monitor the implementation of the licensing agreements	Year 3

Component 2 – Early Generation Seed Production and Distribution			
Strategic Intervention	Specific Action	Proposed Target Result(s)	Proposed Target Year of Achievement of Result
	<ul style="list-style-type: none"> Constitute an internal team/committee to monitor the implementation of the licensing agreements signed with seed companies 		
Design specialized business models for EGS production and supply to the private sector	<ul style="list-style-type: none"> Convene meetings to explore various business models for EGS production 	Seed industry players have agreed on business model for EGS production	Year 1
	<ul style="list-style-type: none"> Develop roadmap and design pilot projects to implement business models for EGS production 	Pilot project(s) for model(s) of EGS production have been designed and are being implemented	Year 2
	<ul style="list-style-type: none"> Implement the selected project(s) on EGS production 	Viable business model(s) for EGS production being implemented	Year 4
Finalize framework for demand forecasting for EGS	Finalize on-going efforts to develop the system for demand forecasting of EGS	Framework for EGS demand forecasting has been adopted by NARIs and seed companies	Year 1
	Develop model tool/application for regular information and data collection and subsequent demand forecasting and planning	Model tool/application for regular information and data collection and subsequent demand forecasting and planning is tested and in use	Year 2 & 3
Develop a culture for seed planning and demand forecasting	<p>NASC to develop and share a guideline for demand planning and record keeping and sharing that all seed players must abide with.</p> <p>Convene series of training on importance of demand planning and forecasting and train actors on the use of tool/app for demand planning.</p>	<p>A national guideline that makes demand planning and forecasting a key obligation is in place.</p> <p>The national capacity for seed planning and forecasting is developed.</p>	Year 1 & 2

Component 3 – Commercial Seed Production and Distribution			
Strategic Intervention	Specific Action	Proposed Target Result(s)	Proposed Target Year of Achievement of Result
Finalize efforts by NIRSAL, SEEDAN and NASC to develop financing models for seed companies and seed enterprises	Finalize the design of these financing models.	Funding models have been deployed to the players in the seed industry.	Year 1
	Convene meetings between the key players (NIRSAL, SEEDAN and NASC) and seed companies to deploy the different funding models.	At least 20 seed companies are accessing finance using the financing models	Year 2
Avail irrigable land with sufficient isolation distances to commercial seed companies and out-growers at preferential lease terms.	Constitute working group to identify existing tracts of available public land that is irrigable, and define modalities of availing this land to seed businesses under commercial terms.	Modalities to access available irrigable land have been developed and shared with seed companies	Year 2
	Develop lease agreements for seed companies to apply to utilize available land.	At least 10 seed companies have applied to access public land for seed production	Year 3
		At least 5 lease agreements have been signed between seed companies and government	Year 3
Professionalize seed companies through a partnership between SEEDAN, NASC, and development partners to provide best-in-class support services in all areas of seed business management.	Conduct due diligence of seed companies in the area of seed quality control at the production and processing levels.	Due diligence in the area of quality assurance has been conducted in at least 15 seed companies	Year 1
	Train seed company staff in response to gaps identified during the due diligence exercise.	All 15 seed companies are addressing the gaps in quality control that have been identified through the due diligence exercise	Year 1

Component 3 – Commercial Seed Production and Distribution			
Strategic Intervention	Specific Action	Proposed Target Result(s)	Proposed Target Year of Achievement of Result
Strengthen agro-input (seed) distribution networks across the country	NASC to set criteria for seed distributorship with strong consideration to seed handling and storage.	A data base of all registered seed distributors nationwide is developed. Criteria for anyone to be registered as a seed distributor is developed	Year 1 & 2
	Seed companies need to include promotional activities in their seed business model especially in their catchment areas. NASC to set up criteria for registration of seed distributorship and establishment of a database of all registered seed distributors nationwide.		

Component 4: Policy, Legal and Regulatory Framework			
Strategic Intervention	Specific Action	Proposed Target Result(s)	Proposed Target Year of Achievement of Result
Finalize the development of the Regulations to implement the NASC Act of 2020	Convene several stakeholder consultations to discuss the draft NASC Regulations.	The NASC Regulations have been gazetted by FMARD after substantive stakeholder participation	Year 2
	Conduct awareness activities on the NASC Regulations, once the Regulations have been passed.	Multiple awareness and sensitization events for stakeholders on the NASC Regulations have been convened	Year 3 (but continuous)
Finalize development of the Regulations to implement the PVP Act of 2021	Convene several stakeholder consultations to discuss the draft PVP Regulations.	PVP Regulations have been gazetted by FMARD after substantive stakeholder participation	Year 2
	Conduct awareness activities on the PVP Regulations, once they have been passed.	Multiple awareness and sensitization events for stakeholders on the PVP Regulations have been convened	Year 3 (but continuous)
Develop and implement funding options for NASC	Develop operational modalities for NASC Fund	The NASC Fund is funded and operational, with a governance structured to guide how funds are utilized and monitored.	Year 2
Improve transparency and efficiency of the National Variety Release Committee	Clarify the roles and responsibilities of the institutions handling the variety registration and release process	Specific roles and responsibilities related to variety registration and release are defined in the NASC Regulations	Year 1
	Increase funding to the variety registration and release committee	National Variety Registration and Release Committee is adequately funded and convenes at least one committee meeting annually	Year 2
		National Variety Catalogue is updated annually	Year 3

Component 5: Quality Assurance			
Strategic Intervention	Specific Action	Proposed Target Result(s)	Proposed Target Year of Achievement of Result
Upgrade two regional seed laboratories at Zaria and Ibadan	Hire an expert to conduct a diagnostic assessment of the two regional seed labs, to identify specific infrastructure, equipment and human resource gaps, and to comprehensively outline the processes and procedures to address these gaps For each lab, develop procurement plan outlining the specific equipment that needs to be purchased, informed by the scoping study Procure equipment in response to the procurement plan.	Diagnostic assessment of the two regional seed laboratories completed and validated by NASC and other stakeholders	Year 1
		Procurement plan outlining the purchase requirements for the two regional seed labs drafted and approved by the NASC	Year 1

Component 5: Quality Assurance			
Strategic Intervention	Specific Action	Proposed Target Result(s)	Proposed Target Year of Achievement of Result
Upgrade the federal seed laboratory and phytosanitary laboratory at Sheda, FCT, to ISTA standards	Hire an expert to conduct a diagnostic assessment of the federal seed laboratory, to identify specific infrastructure, equipment and human resource gaps, and to comprehensively outline the processes and procedures to address these gaps	Diagnostic assessment of the federal seed laboratory completed and validated by the NASC and other stakeholders	Year 1
	Develop a procurement plan outlining the specific equipment that needs to be purchased, informed by the scoping study	Procurement plan outlining purchase requirements for the federal seed laboratory drafted and approved by NASC	Year 1
	Procure equipment in response to the procurement plan.	Equipment for the federal seed laboratory has been procured, installed and is operational	Year 2
Conduct comprehensive training of staff involved in all aspects of QA at federal and regional levels	Review human resource capacity at the three labs and identify specific human resource gaps. This is part of the task of the expert(s) hired to conduct the scoping study in 1(a) above	Scoping study outlining the human resource gaps and training needs in Quality Assurance has been developed and validated by the NASC and other stakeholders	Year 1
	Develop and implement comprehensive staff training program, in line with the upgraded seed laboratories at federal level and in the two regions (Zaria and Ibadan)	At least 75% of the human resource capacity gaps and training needs are being addressed in line with the recommendations in the scoping study.	Year 2
Develop pathway to rollout Seed Tracker and Seed Codex	Hire technical experts to develop a comprehensive program to roll out Seed Tracker and SeedCodex	Comprehensive program to rollout SeedTracker and SeedCodex developed and validated by stakeholders	Year 1
	Implement program to roll out the SeedTracker and SedCodex across other crops. Activities will include technology development and stakeholder awareness	SeedTracker and SeedCodex have been successfully rolled out across the key cereal and legume crops	Year 3
Develop NASC QA program at agro-dealer level	Hire technical expert to develop national training and monitoring program targeting agro-dealers across the country	National training program for agrodealers has been developed and validated by stakeholders	Year 1
	Conduct quality assurance training for agro-dealers across the country, informed by the training and monitoring program in (a) above	At least 50 percent of registered agrodealers have been trained in line with national program	Year 3
Institute program for private seed certification enterprises (PSCEs)	Develop guidelines outlining scope of services that can be outsourced to private enterprises.	Training program and operational guidelines for PSCEs developed and approved by the NASC	Year 1
	Develop detailed training curricular, governance structure and monitoring arrangements for PSCEs	At least one round of training and deployment of PSCEs for specific services (e.g., seed inspection, seed analysis, seed testing) conducted	Year 2
	Implement training program for PSCEs. The training is a fee-based service for the trainees		Year 2
Increase efforts on farmer awareness of the SeedTracker and SeedCodex initiatives	Conduct awareness campaigns for farmers to inform the about the purpose of the SeedTracker and SeedCodex initiatives		

Component 6: National Planning and Coordination			
Strategic Intervention	Specific Action	Proposed Target Result(s)	Proposed Target Year of Achievement of Result
Improve advocacy to increase Nigeria's public budgetary commitments to agriculture	Prepare white paper justifying the need for an increase in the budget to the seed sector	White paper justifying the need to increase the budget to the seed sector has been developed	Year 1
	Present and discuss the white paper under the National Seed Sector Platform, for forwarding to the NASC.	White paper has been presented and validated by stakeholders under the National Seed Sector Platform	Year 1
	Use the white paper as tool for advocacy to other platforms/ government agencies such as the Central Bank of Nigeria (CBN) and the Nigeria Economic Summit Group (NESG)	The white paper has been presented to the key government agencies during at least 5 advocacy events	Year 2
Strengthen SEEDAN as a platform for the private sector seed industry	Develop strategic plan for SEEDAN, to cover all aspects of the organization	Strategic Plan for SEEDAN developed and validated by SEEDAN membership and leadership	Year 2
	Fund the implementation of SEEDAN's strategic plan	Strategic Plan for SEEDAN being implemented	Year 3
Strengthen the existing National Seed Sector Platform	Define the governance structure and operational modalities of the National Seed Sector Platform	Governance structure and operational modalities of the National Seed Sector Platform have been developed and adopted by the members of the platform	Year 1
Establish the Nigeria Seed Sector Fund (NSSDF)	Hire financial expert to design the structure and operational modalities of the Nigeria Seed Sector Development Fund	Structure, operational and funding modalities of the Nigeria Seed Sector Fund have been designed and validated by seed industry stakeholders	Year 2

The total investment estimated to implement the Seed Sector Strategy is USD 5,765,0006 or 2,484,715,000 (Two Billion, Four Hundred and Eighty-Four Million, Seven Hundred Fifteen Thousand). The estimated investment does not include the cost of interventions that are already funded under on-going projects. Table 2 presents a summary of the investment cost by component. The two high-cost components are Breeding and Variety Release (34% of total budget) and Quality Assurance (31%). The high investment for the Breeding and Variety Release component is due to the need to strengthen the human resource and infrastructure capacity at the national research institutes. The high investment for Quality Assurance is to cover costs associated with the refurbishment and/or procurement of equipment for the regional seed laboratories, and to develop a quality assurance program for agro-dealers. The low investment allocation to the Early Generation Seed and Policy, Legal and Regulatory framework components is due to ongoing investments in these areas funded by AGRA and/or implemented under the Collaborative Seed Programme.

Table 5: Summary of investment cost to implement National Seed Sector Strategy

Component	Estimated investment cost (USD)	Estimated investment cost (Naira)	Percentage by component
Breeding and Variety Release	1,975,000	851,225,000	34%
Early Generation Seed production	470,000	202,570,000	8%
Commercial Seed Production and Distribution	530,000	228,430,000	9%
Policy Legal and Regulatory Framework	780,000	336,180,000	14%
National Quality Assurance	1,780,000	767,180,000	31%
National Planning and Coordinator	230,000	99,130,000	4%
TOTAL	5,765,000	2,484,715,000	100%

Of the total investment, the cost of implementing the high-level priority 10 interventions is USD 1,560,000 (One Million, Five Hundred Sixty Thousand US Dollars only), which is 27% of the total investment cost. Several of the priority interventions are part of on-going programs, such as the work by NIRSAL, SSEDAN and NASC to develop financial models for seed companies, and various activities under the Collaborative Seed Programme. Table 5 presents a breakdown of the investment costs for the top ten priority interventions.

Table 6: Investment cost of 10 Priority Intervention

Priority investment	Cost (USD)	Cost description
Finalize efforts by NIRSAL, SEEDAN and NASC to develop financing models for seed companies and seed enterprises	0	On-going work by NIRSAL, SEEDAN and NASC
Professionalize seed companies through a partnership between SEEDAN, NASC, and development partners to provide best-in-class support services in all areas of seed business management.	200,000	Cost of training seed company staff on quality assurance; and monitoring their performance.
Strengthen agro-input (seed) distribution networks across the country	200,000	Cost of agro-input distributor documentation, and on-boarding on seed sector coordination platform as well as conducting of capacity building sessions on seed handling and storage
Finalize development of the Regulations to implement the PVP Act of 2021	0	Ongoing under Collaborative Seed Program and AGRA support. Awareness to include production of copies of regulations both in soft and hard copy and sponsoring of various media and social campaigns using conventional and new media.
Improve transparency and efficiency of the National Variety Release Committee	200,000	Meeting costs for NVRRC committee members

Strengthen SEEDAN as a platform for the private sector seed industry	100,000	Developing and implementing the core aspects of the SEEDAN Strategic Plan
Strengthen the existing National Seed Sector Platform	0	On-going under the Collaborative Seed Program
Upgrade two regional seed laboratories at Zaria and Ibadan	320,000	Conduct a feasibility study and needs assessment of the two labs and then procure equipment and hire staff to address gaps that emerge from the assessment.
Conduct comprehensive training of staff involved in all aspects of QA at federal and regional levels	270,000	Develop and implement comprehensive staff training program, in line with the upgraded seed laboratories at federal level and in the two regions (Zaria and Ibadan)
Develop pathway to rollout Seed Tracker and Seed Codex	270,000	Build on on-going support from AGRA. Put in place adequate infrastructure to manage the roll out, deployment and decentralization of SeedCodex distribution, and build the capacity of actors for efficient utilization to ensure complete integrity of the system
TOTAL	1,560,000	

Table 4 below provides a detailed breakdown of the investments needed by component and by action. The table also shows the actions for ongoing investments and projects. In these cases, the proposed additional investment is either minimal or zero. This is to avoid the duplication of activities.

Table 7: Breakdown of investment costs by component

Component 1: Breeding and Variety Release			
Strategic intervention	Specific action	Estimated budget (USD)	Supporting notes (on-going activity)
Assess the efficiency, transparency, and cost- effectiveness of the current system of variety registration and release	Assessment of the current variety release system	100,000	Fees for experts and meeting costs for NASC, NACGRAB & NABDA
	Implement recommendations from assessment of variety release system	250,000	Meeting costs for variety release committee
Strengthen the infrastructural capacity at the NARIs	Assess the current infrastructural capacity of each NARI using the Breeding Performance Assessment Tool (BPAT) tool: This task can be done by ARCN and/or other capable entities	125,000	Fees for expert, including travels and conducting of short surveys, at about USD25,000 per research institution for 5 institutions
	Implement the recommendations of the BPAT assessment to address the infrastructure gaps within the research institutions	750,000	Cost items depend on recommendations in the BPAT assessment
Strengthened the human resources capacity of the NARIs	(The first task is an assessment of the human resource capacity needs of the NARIs. This will have been done using the BPAT tool above). Support the training and re-training of Breeders on modern breeding techniques and analytical tools.	500,000	Fees for training and retraining of experts local and international including travel and conducting of short-term trainings, at about USD100,000 per research institution for 5 institutions
	Encourage youth to take plant breeding as A course through the provision of Scholarships and grants.	250,000	Scholarships for students enrolled in breeding programs
	Engagement (Recruitment) of more breeders to NARIs		
Component 2 – Early Generation Seed Production and Distribution			
Strategic intervention	Specific action	Estimated budget (USD)	Supporting notes (on-going activity)
Develop the framework for commercialization of public varieties through licensing and royalty payments	The NASC to work with ACRN to develop frameworks for the commercialization of varieties by national research institutions.	50,000	Plans underway to work with the NASC, NML and Syngenta Foundation
	Convene meetings to explain the framework to the seed companies, seed enterprises and research institutions	100,000	Fees for 5 regional meetings with key actors to explain the new framework @ USD20,000 per region. Meeting costs

Component 2 – Early Generation Seed Production and Distribution			
Strategic intervention	Specific action	Estimated budget (USD)	Supporting notes (on-going activity)
	Constitute an internal team/ committee to monitor the implementation of the licensing agreements signed with seed companies	20,000	Meeting costs
Design specialized business models for EGS production and supply to the private sector	Convene meetings to explore various business models for EGS production	50,000	Ongoing under the Collaborative Seed Program and the KAFACI project. Costs mainly towards implementation of projects (last action).
	Develop roadmap and design pilot projects to implement business models for EGS production		
	Implement the selected project(s) on EGS production		
Finalize framework for demand forecasting for EGS	Finalize on-going efforts to develop system for demand forecasting for EGS	250,000	Ongoing under the AGRA support- fund. Conclude the development of a robust framework and scale out the development of capacity for demand forecasting for EGS. This will include demand forecasting training and awareness sessions for breeders, EGS Producers and the regulatory authority

Component 3 – Commercial Seed Production and Distribution			
Strategic intervention	Specific action	Estimated budget (USD)	Supporting notes (on-going activity)
Finalize efforts by NIRSAL, SEEDAN and NASC to develop financing models for seed companies and seed enterprises	Finalize the design of these financing models.	0	On-going efforts by NIRSAL, SEEDAN and NASC
	Convene meetings between the key players (NIRSAL, SEEDAN and NASC) and seed companies to deploy the different funding models		
Avail irrigable land with sufficient isolation distances to commercial seed companies and out-growers at preferential lease terms.	Constitute a working group to identify existing tracts of available public land that is irrigable, and define the modalities for availing this land to seed businesses under commercial terms	30,000	Meeting costs
	Conduct due diligence of seed companies in the area of seed quality control at the production and processing levels		
Professionalize seed companies through a partnership between SEEDAN, NASC, and development partners to provide best-in-class support services in all areas of seed business management.	Conduct due diligence of seed companies in the area of seed quality control at the production and processing levels	100,000	
	Train seed company staff in response to gaps identified during the due-diligence exercise	200,000	Cost for training of at least 100 workers of seed companies, including meeting and transport costs plus resource persons fees and facilitation costs
Strengthen agro-input distribution networks across the country	Set criteria for agro input distributorship with strong consideration to seed handling and storage.	200,000	Cost of agro-input distributor documentation, and onboarding on seed sector coordination platform as well as conducting of capacity building sessions on seed handling and storage
	Seed companies need to include promotional activities in their seed business model especially in their catchment areas.		

Component 4: Policy, Legal and Regulatory Framework			
Strategic intervention	Specific action	Estimated budget (USD)	Supporting notes (on-going activity)
Finalize the development of the Regulations to implement the NASC Act of 2020	Convene several stakeholder consultations to discuss the draft NASC Regulations.	150,000	Ongoing support from AGRA. Cost to cover the development of additional regulations, guidelines and procedures covering the areas not covered by AGRA

Component 4: Policy, Legal and Regulatory Framework			
Strategic intervention	Specific action	Estimated budget (USD)	Supporting notes (on-going activity)
	Conduct awareness activities on the NASC Regulations, once the Regulations have been passed	350,000	To complement ongoing support from AGRA. Awareness to include production of copies of regulations both in soft and hard copy, and sponsoring of various media and social campaigns using conventional and new media
Finalize development of the Regulations to implement the PVP Act of 2021	Convene several stakeholder consultations to discuss the draft PVP Regulations	250,000	Ongoing under Collaborative Seed Program and AGRA support. Awareness to include production of copies of regulations both in soft and hard copy, and sponsoring of various media and social campaigns using conventional and new media. This will also include support for developing other supplementary regulations not covered by current interventions
	Conduct awareness activities on the PVP Regulations, once they have been passed		
Develop and implement funding options for NASC	Develop operational modalities for NASC Fund	30,000	Meeting costs
Improve transparency and efficiency of the National Variety Release Committee	Clarify the roles and responsibilities of the institutions handling the variety registration and release process	0	Covered under Component 1, Intervention #1
	Increase funding to the variety registration and release committee	0	Covered under Component 1, Intervention #1

Component 5: Quality Assurance			
Strategic intervention	Specific action	Estimated budget (USD)	Supporting notes (on-going activity)
Upgrade two regional seed laboratories at Zaria and Ibadan	Hire an expert to conduct a diagnostic assessment of the two regional seed labs, to identify specific infrastructure, equipment and human resource gaps, and to comprehensively outline the processes and procedures for addressing these gaps. For each lab, develop procurement plan outlining the specific equipment that needs to be purchased, informed by the scoping study	20,000	Fees for expert
	Procure equipment in response to the procurement plan	300,000	Procurement of equipment for two laboratories
Upgrade the federal seed laboratory and phytosanitary laboratory at Sheda, FCT, to ISTA standards	Hire an expert to conduct a diagnostic assessment of the federal seed laboratory, to identify specific infrastructure, equipment, and to comprehensively outline the processes and procedures to address these gaps	150,000	On-going under support from AGRA
	Develop procurement plan outlining the specific equipment that needs to be purchased, informed by the scoping study		
	Procure equipment in response to the procurement plan.		
Conduct comprehensive training of staff involved in all aspects of QA at federal and regional levels	Review human resource capacity of the three labs and identify specific human resource gaps. This is part of the task of the expert(s) hired to conduct the scoping study in 1(a) above	20,000	Fees for expert to review human resource gaps
	Develop and implement comprehensive staff training program, in line with the upgraded seed laboratories at federal level and in the two regions (Zaria and Ibadan)	250,000	Training costs

Component 5: Quality Assurance			
Strategic intervention	Specific action	Estimated budget (USD)	Supporting notes (on-going activity)
Develop pathway to rollout Seed Tracker and Seed Codex	Hire technical experts to develop comprehensive program to rollout Seed Tracker and SeedCodex	270,000	Build on on-going support from AGRA. Put in place adequate infrastructure to manage the roll out, deployment and decentralization of SeedCodex distribution, and build the capacity of actors for efficient utilization to ensure complete integrity of the system
	Implement program to rollout the SeedTracker and SeedCodex across other crops. Activities will include technology development and stakeholder awareness		
Develop NASC QA program at agro-dealer level	Hire technical expert to develop national training and monitoring program targeting agro-dealers across the country	20,000	Fees for expert
	Conduct quality assurance training for agro-dealers across the country, informed by the training and monitoring program in (a) above	200,000	Training costs
Institute program for private seed certification enterprises (PSCEs)	Develop guidelines outlining scope of services that can be outsourced to private enterprises.	200,000	On-going support under the BASICS II project for private certification for cassava
	Develop detailed training curricular, governance structure and monitoring arrangements for PSCEs		
	Implement training program for PSCEs. The training is a fee-based service for the trainees		
Increase efforts on farmer awareness of the SeedTracker and SeedCodex initiatives	Conduct awareness campaigns for farmers to inform them about the purpose of the SeedTracker and SeedCodex initiatives	350,000	Ongoing support from AGRA. Awareness to include production of copies of promotional briefs in different languages both in soft and hard copy, and sponsoring of various media and social campaigns using conventional and new media. This will also include support to develop other supplementary regulations not covered by current interventions

Component 6: National Planning and Coordination			
Strategic intervention	Specific action	Estimated budget (USD)	Supporting notes (on-going activity)
Improve advocacy to increase Nigeria's public budgetary commitments to agriculture	Prepare white paper justifying the need for an increase in the budget to the seed sector	10,000	Meeting costs
	Present and discuss white paper under the National Seed Sector Platform, for forwarding to the NASC.	30,000	Meeting and travel costs
	Use the white paper as tool for advocacy to other platforms/ government agencies such as CBN or the Nigeria Economic Summit Group (NESG)	30,000	Meeting and travel costs
Strengthen SEEDAN as a platform for the private sector seed industry	Develop strategic plan for SEEDAN, to cover all aspects of the organization	30,000	Consultation costs
	Fund the implementation of SEEDAN's strategic plan	100,000	Funds for activities
Strengthen the existing National Seed Sector Platform	Define the governance structure and operational modalities of the National Seed Sector Platform	0	On-going funding from Collaborative Seed Program and AGRA (to establish Seed Working Group_
Establish the Nigeria Seed Sector Fund (NSSDF)	Hire a financial expert to design the structure and operational modalities for the Nigeria Seed Sector Development Fund	30,000	Fees for financial expert & meeting costs to validate Report

IMPLEMENTATION ARRANGEMENTS

This section outlines the roles that the various institutions play in seed sector development in Nigeria. The section also highlights the need to build on the seed sector platform as a facility for monitoring the progress of reforms in the sector.

Role of NASC: The NASC Act of 2019 establishes the National Agricultural Seed Council as the government entity in charge of the development of the seed sector in Nigeria. One of the specific roles of NASC, as outlined in Part II of the Act, is to plan, monitor and evaluate the achievements in the seed sector. As one of the key instruments for guiding seed sector development, the Seed Sector Strategy and Investment Plan will be domiciled in the NASC. The National Agricultural Seeds Council (NASC) as the main agency responsible for the implementation of government policy on seeds is well-positioned to coordinate and engage national partners to implement the sector strategy and investment plan.

Role of other key agencies: In addition to the NASC, other key implementing agencies include the Seed Entrepreneurs Association of Nigeria (SEEDAN), the Agricultural Research Council of Nigeria and all mandated Research Institutions for targeted crops of interest, the Federal Ministry of Agriculture and Rural Development (FMARD), the Nigerian Economic Summit Group (NESG), Central Bank of Nigeria (CBN), the Nigeria Incentive-Based Risk Sharing System for Agricultural Lending (NIRSAL), the National Crop Varieties and Livestock Breed Registration and Release Committee (NCVLBRRC), the Consultative Group for International Agricultural Research (CGIAR), the National Center for Genetic Resources and Biotechnology (NACGRAB), the National Agricultural Extension and Research Liaison Services (NAERLS), universities of agriculture and the All Farmers Association (AFAN), as well as commercial end-users and processors.

Seed Sector Platform: In the implementation of its mandate, with support from the Collaborative Seed Program, the NASC has set up a National Seed Sector Platform to bring together the key players in the seed sector and coordinate the main activities in the sector. Further, with support from AGRA, the NASC is setting up a Seed Sector Working Group to strengthen the collaboration between the different stakeholders. The annual SEEDCONNECT Conference and Exhibition has over the years served as a final platform where progresses on sector initiatives are presented for stakeholder awareness and feedback. These three initiatives, the Seed Sector Platform, the seed Sector Working Group and SEEDCONNECT, are adequate arrangements through which the implementation of this Strategy and Investment Plan can be monitored, improved upon and tracked for efficiency and effectiveness.

Reporting on progress: The NASC, under the Collaborative Seed Program, is putting in place a framework for monitoring the implementation of different interventions in the seed sector in the country. Once this framework is finalized, the NASC may provide periodic updates to seed industry stakeholders on the implementation of the Strategy. These updates shall include the status of ongoing projects that respond to the various actions outlined in the strategy. All organizations involved in implementing of the plan will contribute to national seed sector learning based on their expertise and experience. As experiences are generated across partners, they will provide lessons that can guide the continued improvement, monitoring and evaluation of activities in the seed sector and ensure that the results generated by the implementation of the strategy plan are clearly documented and shared outside the country for regional and continental development.

ON-GOING INTERVENTIONS AND PROJECTS IN SEED SECTOR DEVELOPMENT IN NIGERIA

There are several on-going initiatives related to seed sector development in Nigeria. These initiatives include projects or specific investments and 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. The interventions listed in Annex 1 below may not be exhaustive.

Name of intervention	Name of responsible organization	Description of intervention	Activity	Duration of intervention	Budget (if possible)
Collaborative Seed Programme	NASC, WUR, Sahel Consulting, SEEDAN	The project is funded by the Embassy of the Netherlands under the SeedNL program and is aimed at implementing the Nigeria Seed Roadmap. The roadmap has eight topics: (i) decentralization of seed quality assurance; (ii) extension on seed and cultivation practices; (iii) seed company marketing and promotion; (iv) institutional markets; (v) sector governance and coordination; (vi) alignment of donor interventions; (vii) plant variety protection; and (viii) variety release.	Stakeholder awareness of the newly-enacted PVP Act	4 years, from 2021-2025	Varies depending on activities
			Webinar to discuss different business models for EGS		
			Webinar to discuss the performance of the SeedCodex initiative		
			Establishment of the National Seed Platform		
			Evaluation (Due Diligence) of 10 seed companies to assess readiness for crop variety demonstration and promotion		
			Baseline assessment of crop variety release and registration		
Building Capacity of NASC and Seed Companies to Support a Robust Seed System in Nigeria	NASC, AGRA	<p>This project targets 100,000 smallholder farmers and four (4) seed companies to support a robust Seed System in Nigeria. The Grant shall deliver the following specific objectives:</p> <ol style="list-style-type: none"> To support the NASC in implementing seed quality standards and draft regulations under the Seed Act. (Activities include Procurement and Consultancies) To Build the capacity of Four (4) Seed Companies to access EGS and increase certified seed production. To Strengthen the capacity of the NASC to plan and, coordinate EGS and Certified Seed production and Establish an information Management System. 	<ul style="list-style-type: none"> Procurement, Supply and installation of Laboratory Equipment and Consumables Consultancy to initiate accreditation of two laboratories to international Standards through the development of Standard Operational Procedures (SOP's) and conduct lab needs assessment. Presentation of SOPs and need assessment report for stakeholder review and validation Enhance the capacity of the NASC to implement anti-counterfeiting measures Information System. Training of information managers (NASC Personnel and Industry Stakeholders) Conduct feasibility studies to ascertain the level of fake seeds Develop Regulation and Guidelines to support implementation of the NASC Act Develop guidelines and procedures for the operationalization of various aspect of the PVP 	6 months, May to November 2022	

Name of intervention	Name of responsible organization	Description of intervention	Activity	Duration of intervention	Budget (if possible)
			<ul style="list-style-type: none"> Documentation and conduct of bi-annual EGS demand forecasting and production planning meeting on a crop specific and development of five (5) years Capacity building of NASC on Seed planning and co-ordination in line with the ECOWAS Regional Model. Stakeholder Consultation and formation of Seed Working Group Establishment of Seed 		
The Yam Improvement for Incomes and Food Security in West Africa, Phase II (YIIFSWA II) project	NASC, IITA, NACGRAB, NRCRI, Selected Seed Companies.	To develop and prove a functional, commercial seed yam seed system by commercializing the research technologies developed from YIIFSWA-IS	<ul style="list-style-type: none"> Development of the formal seed system of yam Coordinate seed yam production processes to strengthen the supply chain of quality seed yam Provide seed quality control and certification for all established seed yam fields as well as productions from HRPT facilities with enhanced QMP and tools. Establish partnership and linkages in the seed yam value chain through collaborators and stakeholders' workshops. Provide policy direction in decentralization of seed yam quality control and certification 	4 years, from 2017 – 2021	Varies
Development of the Nigerian seed Information Management System (NIGSIMS)	NASC, Mercy Corps, Interra Networks	This project, under the auspices of the USAID Feed the Future initiative, has the overall objective of facilitating the further and efficient distribution of best quality seeds to farmers in the initial target states of Yobe, Gombe, Adamawa and Borno. NIGSIMS seeks to create a new agricultural marketplace that will create both wealth and jobs for participants by furthering the liberalization of the Nigerian agricultural seed input supply chain ecosystem.	The platform will enable famers to access high-quality and improved seedlings and affordable seeds. Seeds, which are the primary and most important of all farming inputs, are not readily available to farmers in the affected states.	9 Months January 2022 to September 2022.	
COVID-19 Rice Seed Response Project (CORIS)	AfricaRice, GIZ, FMARD, NASC, GIC and 10 Seed Companies	Mitigate shortage of rice seed during economic crisis as a result of COVID-19 pandemic in 5 countries (Benin, Burkina Faso, Cote d'Ivoire, Mali and Nigeria). 7t of breeder seed of four rice varieties produced by AfricaRice was distributed to the 10 seed companies for onward multiplication into foundation and certified seed. This is aimed at disseminating improved rice technologies and innovation for the benefit of smallholder farmers and seed entrepreneurs.	<ul style="list-style-type: none"> Production of basic and certified seed for rice Linkage with the GIZ rice value chain distribution program is on-going too. 	2 years (2021 to 2022)	\$1,207,332.00

Name of intervention	Name of responsible organization	Description of intervention	Activity	Duration of intervention	Budget (if possible)
Building a sustainable integrated cassava seed system (BASICS II)		<p>This is the second phase of the BASICS project and it is expected to span 5 years, building on the successes of the first phase.</p> <p>The goal of the BASICS-II project is to provide farmers with access to affordable, quality-assured seeds of the cassava varieties in demand by local food and processor markets through the establishment of a commercially viable seed value chain operating across breeder, foundation, and commercial seed levels. This value chain will enable more efficient dissemination and adoption of new varieties to improve productivity, raise incomes of cassava growers and seed entrepreneurs, enhance gender equity, and contribute to inclusive agricultural transformation in Nigeria and Tanzania.</p> <p>BASICS-II is directly linked to an ongoing investment in modernizing cassava breeding, and will work with Early Generation Seed companies to multiply the breeder and foundation seeds that will be passed on to cassava seed entrepreneurs for the production of certified seed for onward dissemination to farmers.</p>	<ul style="list-style-type: none"> • Develop a robust private seed certification system for Cassava • Implement a full use of digital seed certification tools • Ensuring monitoring and prevention of cassava Brown streak disease • Enhanced quality control for EGS systems especially the pencil stems and SAH 	5 years (2020-2025)	USD538,910
Building smallholder farmer Resilience and reducing vulnerability in the maize-based system in Kaduna State through strengthened market participation	PREMIER SEED, AGRA	<p>The Project is currently being implemented by a consortium of 5 members namely: 1. National Agricultural Extension Research and Liaison Services (NAERLS) 2. International Institute of Tropical Agriculture (IITA) 3. Premier Seed Nigeria Limited 4. EXAF Consulting Limited, and 5. PearlMutual Consulting Ltd.</p>	<ul style="list-style-type: none"> • Training 450 out-growers on good agronomic practices to produce maize, rice, soybean, cowpea and tomatoes. • Establishing 1000ha to seed fields of maize, rice, soybean, cowpea and tomatoes. • Establishing 40 demo plots across 8 LGAs to promote the adoption of improved seeds of the four staple crops • Printing and distribution of 5000 flyers on GAP and other innovations • Packaging and distribution of 72,000 small seed packs for baby and mother demonstrations • Facilitating 3 field inspections to seed fields by NASC officers. 		
Production and Dissemination of Improved Maize, Rice, Soybean, and Cowpea Seeds in Nigeria	PREMIER SEED, WESTHUB	<p>The project overall objectives are as follows:</p> <ul style="list-style-type: none"> • Collaborate with institutional partners to secure 62 MT of the best varieties of breeder/foundation seed for maize, rice, soybean, and cowpea production in the targeted FtF states. 	<ul style="list-style-type: none"> • Training 789 out-growers on good agronomic practices to produce maize, rice, soybean, cowpea and tomatoes. • Establishing 1,415 ha to seed fields of maize, rice, soybean, cowpea and tomatoes. 		

Name of intervention	Name of responsible organization	Description of intervention	Activity	Duration of intervention	Budget (if possible)
		<ul style="list-style-type: none"> Support 750 out-growers (70 percent youth; 30 percent women) in the targeted FtF states to nearly double their annual production of certified maize, rice, soybean, and cowpea seed from 1,650 to 3,000 MT through the provision of breeder/foundation seed, other agricultural inputs, and training in GAP. Market the 3,000 MT of certified seeds produced by the out-growers to 4,000 smallholder farmers in the targeted FtF states through Premier Seed's network of zonal offices, agro-dealers, commission agents (including 300 new recruits), and rural sales promoters. Analyze increases in yield of the 4,000 smallholder farmers who purchase the 3,000 MT of certified seed produced by the benefiting out-growers 	<ul style="list-style-type: none"> Establishing 56 demo plots across 8 states to promote the adoption of improved seeds of the four staple crops Printing and distributing of 15,000 flyers on GAP and other innovations Facilitating 3 field inspections to seed fields by NASC officers. 		
Development / Strengthening of Seed Multiplication and Dissemination System in Africa	NASC KAF-ACI, RDA - Korea	This project is a technical cooperation project supported by the Rural Development Administration (RDA) of the Republic of Korea through the Korea-African Agriculture and Food Cooperation Initiative (KAFACI). The overall goal of the project is to enhance rice productivity and improve livelihood of smallholder's farmers in Nigeria.	<ul style="list-style-type: none"> Baseline study to investigate and analyze the status of rice seed production and dissemination systems. Training and capacity building workshop for seed specialists on rice seed multiplication and variety maintenance. Establish complex for multiplication of breeder seed, foundation seed and certified seed for rice. 	Jan. 2020 – June 2022	
Increasing production and dissemination of quality Early Generation Seeds (EGS) to improve income and food security of farmers in Nigeria.	NASC, AGRA, Premier Seeds, Value Seeds Limited	<p>Project aims to improve seed quality and increase Early Generation Seeds (EGS) Supply in Nigeria through:</p> <ul style="list-style-type: none"> Production and dissemination of quality EGS The introduction of the electronic Seed authentication system called the SEEDCODEX. Stakeholder sensitization The development and publication of variety descriptors for selected varieties of Maize, Rice and Soybean. 	<ul style="list-style-type: none"> Production and dissemination of foundation seed for maize, rice and soya bean Design and implement an Electronic Seed Authentication for the seed system (SeedCodex) Production and Dissemination of tamper Evident Labels (SeedCodex tags) Stakeholder sensitization to enhance acceptance and buy-in of the technology 	Feb. 25, 2019, to Feb. 24, 2022 (36 Months)	



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