



NIGERIA Guidebook on Regulatory Aspects of Dissemination of Public Varieties

Introduction

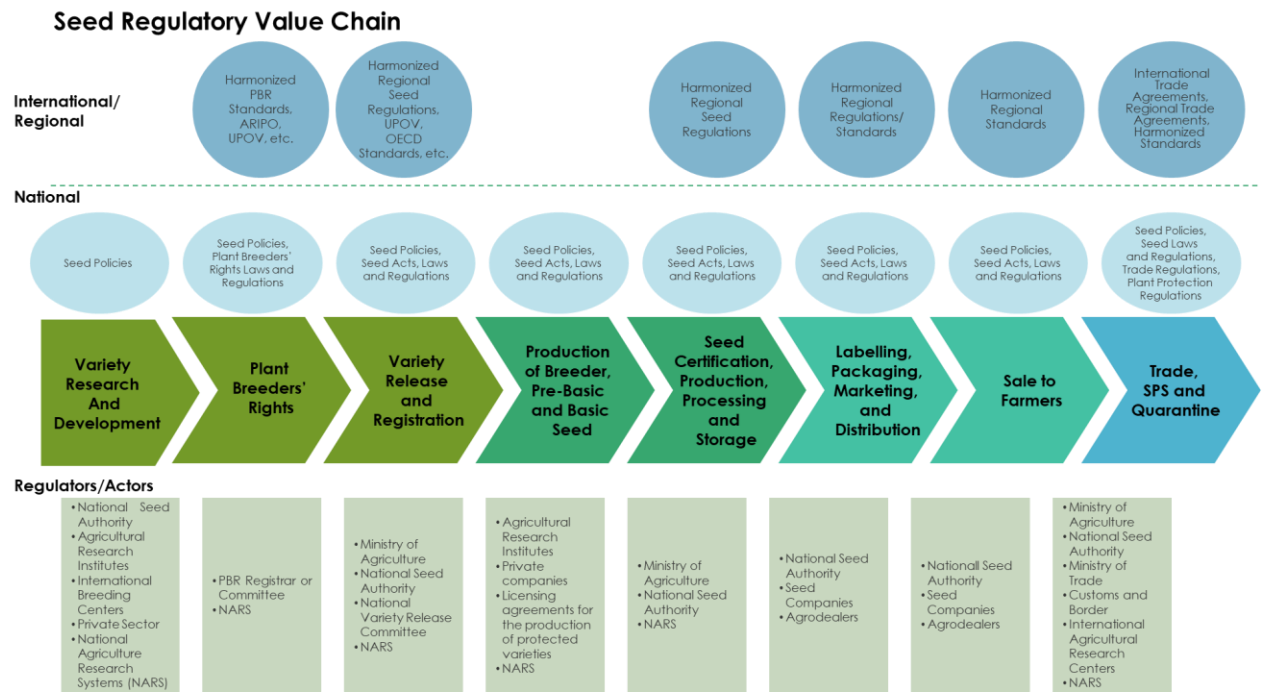
In Nigeria, and throughout sub-Saharan Africa, the public sector is heavily involved in seed breeding. Yet, challenges still exist with ensuring that public seed varieties reach the market. Regulatory processes and procedures at both the national and regional levels, including rules on variety release and registration and licensing of public varieties for private sector commercialization, will play a direct role in the dissemination of public varieties within Nigeria and more broadly within regional markets. Ultimately, national regulatory systems will impact the ability of public institutions to achieve their mandate of developing new seed varieties for use as a public good.

This Nigeria Guidebook on Regulatory Aspects of Dissemination of Public Varieties (Nigeria Guidebook) is designed to serve as a practical guide for National Agricultural Research Services (NARS) and their partnerships with the Centers of the Consultative Group for International Agricultural Research (CGIAR Centers) to assess common regulatory issues that affect dissemination and commercialization of public varieties. The Guidebook was developed by the New Markets Lab (NML) and Syngenta Foundation for Sustainable Agriculture (SFSA) under the Accelerated Varietal Improvement and Seed Delivery of Legumes and Cereals in Africa (AVISA) project, launched in 2018 with

support from the Bill and Melinda Gates Foundation (BMGF) and conducted in partnership with the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the International Institute of Tropical Agriculture (IITA), and the International Center for Tropical Agriculture (CIAT). AVISA is an initiative that focuses on increasing the productivity, profitability, resilience, and marketability of grain legume and cereal crops including groundnut, common bean, cowpea, sorghum, and millet, across seven African countries.¹

The Nigeria Guidebook focuses on several key aspects of the seed regulatory value chain (see Figure 1) in Nigeria, with a particular emphasis on recent changes to Nigeria’s legal and regulatory framework for seed. Relevant areas of focus include the process for registering seed varieties, highlighting differences between registration under Nigerian law and registration following the Economic Community of West African States (ECOWAS) rules. It also covers legal and regulatory issues related to licensing of public varieties and should be used in tandem with the AVISA Guide on Licensing Agreements.

Figure 1: Seed Regulatory Value Chain



© 2019 New Markets Lab, adapted from New Markets Lab, "Legal Guide to Strengthen Tanzania's Seed and Input Markets", New Markets Lab with the Southern Agricultural Growth Corridor of Tanzania (SAGCO) Centre Ltd. for the Alliance for a Green Revolution in Africa (AGRA) and U.S. Agency for International Development (USAID) (April 2016).

¹ The seven focus countries under AVISA are: Burkina Faso, Ghana, Mali, Nigeria, Tanzania, Ethiopia, and Uganda.

Under ECOWAS, varieties must go through the process for variety registration in one Member State before they can be traded freely in additional ECOWAS countries without registration. The national variety registration process is, therefore, increasingly important as a gateway to regional trade, making the speed, efficiency, and transparency of this process key to whether new varieties can be commercialized both in country and more broadly. The national variety registration process for ECOWAS Member States is guided by the ECOWAS Procedure Manual for Variety Registration in the National Catalogue for Crop Species and Varieties in West African Countries, which applies to 11 crops (groundnuts, sorghum, pearl millet, rice, maize, cassava, Irish potato, yam, onion, tomato, and cowpea).

In Nigeria, seed varieties must be registered before they can be commercialized and sold in the market. For many public varieties, a transfer will take place between the public and private sectors following variety registration and before a variety is commercialized. This is typically done through a licensing agreement, which can be a critical tool for transfer of rights to use a variety and payment of royalties to the national research institutions. Although licensing agreements can be based only on a transfer of the right to commercialize a registered variety (essentially the variety registration itself), they can also rest on plant variety protection (PVP), which is an emerging area of law in Nigeria and may ultimately strengthen protection to the breeder beyond just the commercial party and provide an avenue for securing revenues for further development of public varieties. Nigeria does not yet have a legal framework on PVP, although the new National Agricultural Seeds Council (NASC) Act of 2019 provides that a PVP law shall be put in place based on internationally recognized criteria.

This Nigeria Guidebook focuses on key regulatory areas central to the ability of the NARS to achieve their mandate of researching and developing new seed varieties for use as a public good, including:

- Recent changes in Nigeria’s legal and regulatory framework for seed with the enactment of the 2019 NASC Act.
 - The NASC Act was a step forward in implementing the ECOWAS rules in Nigeria, although additional steps will need to be taken (including the development of additional regulations) and some differences between the NASC Act and ECOWAS rules remain, as discussed in this Guidebook.
 - In particular, the NASC Act includes recognition of the West African Catalogue of Plant Species and Varieties (WACPSV) established under ECOWAS and explicitly links the WACPSV to Nigeria’s National Crop Varieties Release Catalogue.

- Other changes under the NASC Act relate to the variety release and registration process, including differentiation between varieties that are domestic-bred, foreign-bred and registered, used in informal seed systems, already registered through a regional variety release system, or genetically modified. Under the NASC Act, the NARS remain very involved in the variety release and registration process. Regulations to be passed under the NASC Act will describe procedures to be followed in releasing and registering each of the different categories of varieties. Since regulations have not yet been passed, the *Guidelines for Registration and Release of New Crop Varieties in Nigeria 2016* developed by the National Centre for Genetic Resources and Biotechnology (NACGRAB) regarding variety release and registration continue to apply.
 - The NASC Act also calls for the establishment of a Seed Registration and Release Subcommittee, which will be further developed through regulations.
 - The NASC Act creates an Official Certification Service with the mandate of overseeing the process of seed certification and quality control. Under the NASC Act, NASC may also authorize private certification bodies to undertake quality control and seed certification on its behalf and under its supervision.
 - Nigeria does not yet have a legal framework on PVP, although the NASC Act provides that a PVP law shall be put in place based on internationally recognized criteria.

- Legal and regulatory dynamics of ECOWAS rules and regulations.
 - Nigeria is a member of ECOWAS and has adopted the ECOWAS Seed Regulations through the newly enacted NASC Act.²
 - The ECOWAS Seed Regulations establish an ECOWAS Regional Seed Committee and the WACPSV; new varieties can be entered into the WACPSV when registered in one Member State and should be allowed to be freely traded throughout the region
 - ECOWAS has a Procedure Manual for Variety Registration in the National Catalogue for Crop Species and Varieties in West African Countries (ECOWAS Procedure Manual), with guidelines on procedures to be followed by Member States in the national release and registration of varieties. The ECOWAS Procedure Manual includes testing provisions for distinctness, uniformity, and stability (DUS) and variety for cultivation and use (VCU) for the ECOWAS eleven priority crops (groundnut,

² ECOWAS Regulation C/REG.4/05/2008 on Harmonization of the Rules Governing Quality Control, Certification and Marketing of Plant Seeds and Seedlings in ECOWAS Region. May 2008.

sorghum, pearl millet, rice, maize, cassava, Irish potato, yam, onion, tomato, and cowpea).

Overview of Nigeria's Seed Regulations

The 2019 NASC Act represents a significant update to Nigeria's legal and regulatory framework for seed. Additional legal and regulatory instruments apply, including:

- The National Agricultural Seed Council Act of 2019;
- National Seed Policy, 2015;
- The Agricultural Policy, 2020; and
- The Guidelines for Registration and Release of New Crop Varieties in Nigeria 2016.

At the regional level, relevant measures include: (i) Regulation C/REG.4/05/2008 on Harmonization of the Rules Governing Quality Control, Certification and Marketing of Plant Seeds and Seedlings in the ECOWAS Region (ECOWAS Seed Regulation), and (ii) The ECOWAS Procedure Manual for Variety Registration in the National Catalogue for Crop Species and Varieties in West African Countries. These will be discussed in more detail in the section below.

The NARS in Nigeria, in partnership with the CGIAR Centers, play a crucial role in the formal seed system by developing plant varieties and producing breeder seed.³ The public sector dominates plant breeding, representing 87 percent of varieties released in the Nigerian market.⁴ According to the 2019 African Seed Access Index (TASAI) report on Nigeria, 19 of the 23 active breeders of the four priority crops (maize, rice, sorghum and soya bean) are based at various NARS.

The Agricultural Research Council of Nigeria coordinates NARS (or National Agricultural Research Institutes (NARIs)) in Nigeria. There are 15 NARS in Nigeria specializing in public breeding of different crops, including the Institute for Agricultural Research of Northern Nigeria, the National Horticultural Research Institute, the National Root Crops Research Institute, the National Cereals Research Institute, Lake Chad Research Institute, and Jigawa State Research Institute. Public universities also engage in the development of public plant varieties, such as the University of Ibadan, Obafemi

³ Nigeria Early Generation Seed Study, World Bank 2016. <https://www.africleadfff.org/wp-content/uploads/2016/09/Nigeria-EGS-Study-Final-Report-August-2016.pdf>.

⁴Access to Seed Index, Nigeria Profile, available at: <https://www.accessstoseeds.org/index/western-central-africa/country-profile/nigeria/>.

Wolowo University, University of Agriculture of Abeokuta, and the University of Ado-Ekiti. CGIAR Centers work in partnership with the NARS and universities, including IITA, ICRISAT, and AfricaRice. The common crops bred by public institutions include maize, rice, sorghum, cowpea, and groundnut.

While the NARS play a central role in breeding public varieties that are used by most smallholder farmers, they do face challenges that affect the institutions' ability to fully perform their mandate. According to the Food and Agriculture Organization of the United Nations (FAO), Nigeria's NARS system was historically one of the largest in Africa but has experienced setbacks mainly due to challenges with funding.⁵ While the nominal funding of research has increased over the years, inadequacies still remain. In 2017, studies showed that Nigeria's agricultural research spending as a percentage of the agricultural gross domestic product (GDP) was at 0.35 percent, which is substantially lower than the intended 3 percent in the 2020 Agricultural Policy.⁶ Besides being inadequate, research funding is mostly irregular and untimely, which makes it difficult for the NARS to respond to market needs and challenges the stable continuity of long-term research for the development of new plant varieties.⁷

Under Nigeria's 2020 Agricultural Policy, there is an agricultural credit scheme aimed at increasing sectoral allocation of agricultural loans from 15 to 25 percent. There are also other schemes aimed at funding the agricultural sector, including the Agricultural Credit Guarantee Scheme Fund, Agricultural Credit Support Scheme, and the Commercial Agricultural Credit Scheme. However, much of this funding goes to the private sector, and funding of the public research initiatives remains under the ambit of the federal government.

Nigeria's Agricultural Policy obliges government to encourage close links between public research institutes and extension agencies to ensure dissemination of research findings and technologies to users. However, in practice these links are not strong, due in part to a disconnect in the flow of information among the relevant stakeholders, including farmers' communication of their needs to the NARS and the NARS' development and distribution of technologies to meet those farmers' needs. The bridge between the

⁵ FAO, Global Partnership Initiative for Plant Breeding Capacity Building; Plant Breeding Programs in Nigeria, available at: <http://www.fao.org/in-action/plant-breeding/our-partners/africa/nigeria/en/>.

⁶ Agricultural Science & Technology Indicators (ASTI) (2017): Agricultural Science & Technology Indicators: Open Access Data and Analysis of Agricultural Research Investment in Low- and Middle-Income Countries. Available at <http://www.asti.cgiar.org>. See also, the Agricultural Policy of Nigeria, available at: <http://extwprlegs1.fao.org/docs/pdf/nig149296.pdf>.

⁷ Ambrose Alikidon, Challenges and Experiences of Agricultural Research Council of Nigeria in Making Agricultural Research Woke for End-users in Nigeria, Nigerian Agricultural Policy Research Journal (NAPReJ) Vol. 3. Issue 1. Available at: <http://www.aprnetworkng.org>.

publicly developed technologies and farmers could be partly strengthened through licensing agreements, which would formally transfer the use rights over publicly developed varieties to private seed companies, which have the financial capacity to commercialize these seeds and ensure that they reach farmers.

Public institutions also generally face significant challenges establishing sustainable sources of income to support ongoing research and registration of their varieties.⁸ The variety registration process is relevant in this context as are licensing agreements once a variety is registered.⁹ Developing new plant varieties is a time intensive activity, yet the breeders, and the NARS are not rewarded for the time spent during innovation and development of the technologies. Through licensing agreements, public institutions could also establish a source of income to support their breeding activities, including research and development of new varieties. PVP, once enacted and if used by public breeders, could also act as an incentive for breeders and may create additional protection for public varieties that have been registered and commercialized, particularly when traded regionally.

Despite efforts to increase access to improved varieties, most seed sector activity in Nigeria continues to occur in the informal sector.¹⁰ For instance, less than 30 percent of smallholder farmers in Nigeria use improved seed from the formal sector, while the rest use farmer-saved seed from the informal sector.¹¹ Access to improved seeds could greatly benefit Nigeria's seed sector and increase market opportunities at the regional level.

Legal and Regulatory Framework for Seed Variety Release and Registration in Nigeria and Regionally

Nigeria's Variety Release and Registration Legal and Regulatory Framework

The NASC Act of 2019 regulates the process of variety release and registration in Nigeria. The NASC Act repealed and replaced the National Agricultural Seeds Act, Cap 5 that previously applied to variety release and registration processes in Nigeria. The

⁸ Guide on Flexible Licensing Models and Agreements, Accelerated Varietal Improvement and Seed Delivery of Legumes and Cereals in Africa (AVISA) Project, NML, November 2019.

⁹ Guide on Flexible Licensing Models and Agreements, Accelerated Varietal Improvement and Seed Delivery of Legumes and Cereals in Africa (AVISA) Project, NML, November 2019.

¹⁰ Katrin Kuhlmann, et al, Seed Policy Harmonization in ECOWAS: The Case of Nigeria, 2018.

¹¹ Katrin Kuhlmann, et al, Seed Policy Harmonization in ECOWAS: The Case of Nigeria, 2018. See also, S. Olomola and M. Nwafor, Nigeria Agriculture Sector Performance Review, 2018. https://www.researchgate.net/publication/327666294_NIGERIA_AGRICULTURE_SECTOR_PERFORMANCE_REVIEW_2017.

2019 NASC Act introduces some new aspects of variety release and registration that did not exist in the National Agricultural Seeds Act, including providing for the Seed Registration and Release Subcommittee mandated with advising NASC on the establishment and updating of the National Seed Catalogue, evaluation of information from the National Performance Trials, assisting with any matter for approval of NASC regarding the release and registration of varieties, and the implementation of the West African Seed Catalogue. The NASC Act differentiates between different types of varieties: domestic-bred, foreign-bred and registered, to be used in the informal seed systems, already registered through a regional variety release system, or genetically modified.

New domestic varieties intended for registration must undergo multi-year and multi-location trials in accordance with the Variety Release and Registration Guidelines. Notably, since the passing of the NASC Act, new guidelines have not yet been put in place and the guidelines currently applicable are the *Guidelines for Registration and Release of New Crop Varieties in Nigeria 2016*, developed by NACGRAB regarding variety release and registration.

Under the 2016 Guidelines for Registration and Release of New Crop Varieties 2016, a licensed seed company or recognized research center may present a crop variety for registration and release by making an application for variety registration and release to the Registrar of NACGRAB, with payment of prescribed fees and 40 copies each of all required documents (methodology and tables for the trials conducted, justification for the nomination, and recommendations and references).¹²

A new variety must pass the DUS and VCU tests in order for it to be released by the National Crop Varieties and Animal Breeds Registration and Release Committee (NVRC). The Guidelines for Registration and Release of New Crop Varieties contains a list of NARS in Annex I that are established under the Institute of Agricultural Research (IAR) to coordinate research on each of the crops cultivated in Nigeria. The NARI responsible for a particular crop is charged with overseeing field tests for the new varieties of that crop and determining whether the variety meets both the DUS and VCU requirements. In the variety registration process, the NARI must be approved by the Registrar of NACGRAB on the recommendation of NASC, and the breeder may nominate the NARI he or she wishes to conduct the field tests or apply to the Registrar to make such recommendation. The appointed NARI will conduct and oversee the field tests for the breeder's candidate variety during on-station, multi-locational, and on-farm trials.

¹² See, Katrin Kuhlmann, et al, Seed Policy Harmonization in ECOWAS: The Case of Nigeria, 2018.

The breeder must conduct DUS on-station trials of the candidate variety within the premises of the relevant NARI for at least one year, in accordance with International Union for the Protection of New Varieties of Plants (UPOV) guidelines.¹³ After the on-station trials, the registrar of NACGRAB may recommend that it undergo multi-locational trials, which will be conducted by the appointed NARI for at least two years across different agro-ecological zones in not less than 10 testing sites per year. The VCU test is examined at this stage and is followed by the on-farm trials conducted by the breeder to validate the perception of farmers about the candidate variety and generally test its adaptability. The on-farm trials are carried out over one year in at least 10 farmers' fields across different agro-ecological zones under the supervision of the appropriate government extension organization.

After the field tests, the Registrar of NACGRAB will compile the test results report, convene the meeting of the Technical Sub-Committee on Crops, and convey the findings of the test results report. The Technical Sub-Committee on Crops reviews and deliberates on applications for variety registration and makes recommendations to the NVRC for final deliberation and approval. If approved, five kilograms (kg) of breeder's seed is given to NACGRAB for safekeeping in the National Genebank, and 50 kg of foundation seed is given to the NASC for seed certification.¹⁴ If the NVRC declines to release the variety, the Registrar of NACGRAB will notify the applicant, who may then present a renewed application for variety release and registration.

Notably, the new NASC Act establishes the Seed Registration and Release Subcommittee, which means that new guidelines will have to be developed or the 2016 guidelines amended to align with the NASC Act to avoid the existence of two technical subcommittees with duplicative roles (the new Seed Registration and Release Subcommittee and Technical Sub-Committee on Crops of the NVRC). This is especially necessary because the NASC Act mandates the Seed Registration and Release Subcommittee to review the national performance trials report and advise the NASC instead of the NVRC on whether the variety should be approved for release or not. Further, the NASC Act also mandates the Minister of Agriculture and Rural Development to approve procedures for registration of new varieties in the National Crop Varieties Release Catalogue, on the advice of NASC. Specific procedures have, however, not yet been developed (these will be elaborated in forthcoming regulations), which creates uncertainty in the seed sector about the variety release and registration process.

¹³ Clause 1.0, Guidelines for Registration and Release of New Crop Varieties in Nigeria 2016.

¹⁴ NACGRAB Guidelines for Registration and Release of New Crop Varieties in Nigeria 2016.

It is worth noting that the NVRC meets only once or twice a year depending upon funding. Prior to the meeting, the Registrar provides six weeks' notice of the varieties to be discussed, and a four-week window is given for nominations to the NVRC. Any nominations presented fewer than two weeks prior to the meeting will be tabled for a subsequent meeting. The National Crop Varieties Release Catalogue includes all varieties registered in Nigeria; it is published by NACGRAB and can be found online.

As noted below, the variety registration process can be costly, and the costs may vary depending on the proximity of the breeder to different sites and the number of varieties a breeder is testing at a time. In a study conducted by the New Markets Lab in 2018, stakeholders in the Nigerian seed sector reported differing costs during the variety release and registration process.¹⁵ Since no regulations have yet been passed under the NASC Act to guide the variety release and registration process, following the ECOWAS Procedure Manual for Variety Registration in the National Catalogue for Crop Species and Varieties in West African Countries could be appropriate.

Under the NASC Act, variety testing could be completely waived by the Minister of Agriculture and Rural Development, on the advice of the Seed Registration and Release Subcommittee established by NASC, for varieties registered under a regional system. This would extend to varieties beyond those registered under the ECOWAS system. Under ECOWAS rules, a variety entered into the regional catalogue should be automatically accepted by another ECOWAS Member State with no further testing required.

Varieties used in informal seed systems are only subject to registration and proper description prior to their sale on the market. Varieties that are foreign-bred and registered but seeking release in Nigeria shall be subjected to limited multi-location variety verification trials in accordance with rules and procedures set by the Seed Registration and Release Subcommittee. Genetically modified varieties can be considered for registration if they conform to the Bio-safety Regulations of Nigeria and the Cartagena Protocol. Procedural guidelines on the release and registration of varieties that are foreign-bred and registered, already registered in another regional variety release system, or genetically modified, are intended to be developed under the NASC Act but do not yet exist. This may create uncertainty in the market in the intervening period. Figure 2 below (New Markets Lab Regulatory Systems Map) summarizes Nigeria's variety release and registration process under the new NASC Act.

¹⁵ See, Katrin Kuhlmann, et al, Seed Policy Harmonization in ECOWAS: The Case of Nigeria, 2018.

Figure 2: New Markets Lab Regulatory Systems Map on Nigeria’s Variety Release and Registration Process



Source: © 2019, New Markets Lab

The NASC Act recognizes the West Africa Catalogue of Plant Species and Varieties under the ECOWAS seed regulatory framework. One major change introduced by the NASC Act in relation to variety release and registration is that it connects Nigeria’s National Crop Varieties Release Catalogue with the ECOWAS West Africa Catalogue of

Plant Species and Varieties, treating it as a point of reference and complement to the national catalogue. This will enable commercialization of varieties listed in the WACPSV in Nigeria, especially because the NASC Act now waives testing requirements for a variety already registered in a regional variety system. Nigeria's National Crop Varieties Release Catalogue will, however, need to be updated to add the varieties listed on the WACPSV and other new varieties that have been released but not yet listed in the national catalogue.

According to the NASC Act, once a variety has been released and registered, it then has to be certified before it can be sold in the Nigerian market. Under the NASC Act, the certification process is aligned with the ECOWAS Regulations and international standards. However specific regulations that establish the particular certification requirements and procedures have not yet been put in place by NASC. An Official Certification Service is created under the new NASC Act with the mandate of overseeing the process of seed certification and quality control. Under the NASC Act, NASC may also authorize private certification bodies to undertake quality control and seed certification on its behalf and under its supervision. This is expected to fast-track the certification process and reduce the NASC's workload, considering that it has previously had resource constraints. The NASC Act also creates a fund for NASC to cover all expenses involved in the administration of the NASC Act. All of these changes are yet to be implemented in practice, however.

According to the 2019 TASAI report, stakeholders in Nigeria reported that the entire variety release and registration process takes on average 43 months and costs between US\$2,000 and US\$27,000, with variation due to the proximity of the breeder to different sites and the number of varieties a breeder is testing at a time. The World Bank Enabling the Business of Agriculture (EBA) has estimated the registration of a variety to take 367 days (approximately twelve and a half months) for cereal varieties.¹⁶ The EBA assessment is based on the old legal framework, however, and the process may be shortened under the new NASC Act. According to the EBA, registering a new variety in Nigeria costs 171.6 percent of income per capita,¹⁷ which translates to USD 3,569 (USD). Overall, Nigeria ranks 67th out of 101 EBA countries, with one being the highest rank possible, and 101 being the lowest rank possible), with a score of 49.17 (out of a hundred).

Given the size of Nigeria's seed market and its importance in the ECOWAS region, Nigeria's seed system could perhaps be benchmarked against the regulatory systems in

¹⁶ World Bank Enabling the Business of Agriculture (EBA) Indicator, 2019, available at <https://eba.worldbank.org/en/data/exploreconomies/nigeria/2019>.

¹⁷ World Bank Enabling the Business of Agriculture (EBA) Indicator, 2019, available at <https://eba.worldbank.org/en/data/exploretopics/all-topics>.

Ghana and Zambia (Ghana is also a member of ECOWAS, and Zambia is considered to be a hub within sub-Saharan Africa). Table 1 contains a comparison of Nigeria, Ghana, and Zambia, based on EBA indicators and NML’s Regulatory Systems mapping.¹⁸

Table 1: Indicators Comparative Table

Country	EBA Rank	EBA Score	Overall Score for Supplying Seed	Total Days to Register a Variety	Cost to Register a Variety (USD)	Quality of Seed Regulation (0-9)	PVP Law	NML’s Total Steps to Register a Variety
Nigeria	67	49.17	63.43	367	3,569	4	No	9
Ghana	63	50.49	21.73	757	15,079	5	No	6
Zambia	52	63.73	76.76	544	1,113	9	Yes	5

Source: New Markets Lab from Enabling the Business of Agriculture, World Bank Report, 2019; *See also*, Katrin Kuhlmann, Yuan Zhou and Shannon Keating, “Seed Policy Harmonization in COMESA and SADC: The Case of Zambia,” Syngenta Foundation for Sustainable Agriculture and New Markets Lab, September 2018; Katrin Kuhlmann and Yuan Zhou, Seed Policy Harmonization in ECOWAS: The Case of Ghana (Basel, Switzerland: Syngenta Foundation for Sustainable Agriculture, September 2015); and Katrin Kuhlmann, et al, Seed Policy Harmonization in ECOWAS: The Case of Nigeria, 2018.

ECOWAS Regional Variety Release and Registration

Nigeria is an ECOWAS Member State and has harmonized its newly enacted NASC Act with the ECOWAS Seed Regulation. Harmonization is regarded as an important factor in promoting a modern and competitive seed industry both at the national and regional levels.¹⁹ The ECOWAS Seed Regulation covers eleven major crops that are important to food security and trade within the region: maize, pearl millet, rice, sorghum, cassava, Irish potato, yam, cowpea, groundnut, onion and tomato. Following the determination to adopt regulations on the administration of the seed system, ECOWAS adopted enabling regulations on the roles, organization and functions of the West Africa Seed Committee (WASC) in June 2012.²⁰ The WASC was created under the ECOWAS Seed Regulation to implement rules on seed quality control, certification and marketing.

¹⁸ World Bank Enabling the Business of Agriculture (EBA) Indicator, 2019, available at <https://eba.worldbank.org/en/data/exploretopics/all-topics>.

¹⁹ Katrin Kuhlmann, et al, Seed Policy Harmonization in ECOWAS: The Case of Nigeria, 2018. See also Katrin Kuhlmann and Yuan Zhou, *Seed Policy Harmonization in ECOWAS: The Case of Ghana* (Basel, Switzerland: Syngenta Foundation for Sustainable Agriculture, September 2015).

²⁰ Keyser John. “Regional Trade of Food Staples and Crop Inputs in West Africa” World Bank Group. March 2013; See also Katrin Kuhlmann, et al, Seed Policy Harmonization in ECOWAS: The Case of Nigeria, 2018.

In ECOWAS, any variety entered into the national catalog of a Member State should become part of the West African Catalogue for Plant Species and Varieties. The first edition of the catalogue was published in 2016, with 1,496 plant varieties of the 11 priority crops, and is intended to be revised every two years. The West African Catalogue for Plant Species and Varieties operates differently from the catalogues in other regions, since new varieties only need to be registered in one Member State in order to be eligible for entry in the regional catalogue; the Common Market of Eastern and Southern Africa (COMESA) and Southern African Development Community (SADC) (as does proposed legislation in the East African Community (EAC)) require registration in two countries in order to be eligible for entry in the regional catalogue.²¹ The process established through the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), which is currently followed by most of the members of the EAC, allows that a variety registered in one country's national catalogue can be registered in another country following a streamlined domestic testing procedure with only one season of VCU trials, which essentially serves as a "confirmation" test.²² COMESA's rules include a similar process for "fast-tracking" varieties already registered in one member country. In practice, however, the West Africa Catalogue for Plant Species and Varieties is essentially a compilation of the national catalogues of individual countries,²³ although steps such as the recent legal changes in Nigeria, which formally link the regional catalogue with the national catalogue, will increase its effectiveness and implementation.

²¹ Katrin Kuhlmann and Yuan Zhou, *Seed Policy Harmonization in ECOWAS: The Case of Ghana* (Basel, Switzerland: Syngenta Foundation for Sustainable Agriculture, September 2015). See also, New Markets Lab, *Economic Impact Assessment and Legal Review of the East African Community Seed and Fertilizer Legislations*, 2019; New Markets Lab, *Manual on Regional Seed Regulations in the Common Market for Eastern and Southern Africa (COMESA)*, Syngenta Foundation for Sustainable Agriculture under the Seeds2B Initiative and Partnerships for Seed Technology Transfer in Africa (PASTTA), February 2019, (based on the COMESA Seed Trade Harmonization Regulations, (2014)).

²² The existing seed regulation harmonization arrangement in East Africa is based on an agreement on variety release and registration, which was reached between Uganda, Kenya, and Tanzania and is based on the work of ASARECA, the Eastern and Central Africa Program for Agricultural Policy Analysis (ECAPAPA), and the Eastern Africa Seed Committee (EASCOM). It is currently being implemented under the ASARECA/ECAPAPA Agreement, Monograph Series No. 4. The ASARECA/ECAPAPA work also includes harmonization of seed certification procedures, SPS regulation, plant variety protection, and seed law and regulations (New Markets Lab, 2015). Rwanda has also shown interest in joining the arrangement. The East African Community is in the process of developing harmonized rules, which will likely both incorporate and supplant the ASARECA/ECAPAPA Agreement.

²³ Keyser John. "Regional Trade of Food Staples and Crop Inputs in West Africa" World Bank Group. March 2013; See also Katrin Kuhlmann, et al, *Seed Policy Harmonization in ECOWAS: The Case of Nigeria*, 2018.

The variety release and registration process in ECOWAS Member States is meant to follow the ECOWAS Procedure Manual for Variety Registration in the National Catalogue for Crop Specifics and Varieties in West African Countries, which was developed in 2008. The ECOWAS Procedure Manual includes technical aspects on the regional testing protocols for conducting DUS and VCU tests based on international best practices under UPOV and applies to the eleven major crops that are covered by the ECOWAS Seed Regulations.

Under the ECOWAS Procedure Manual, every ECOWAS Member State should designate a National Seed Committee (NSC) responsible for registration of new varieties in the national catalogue. The NSC is mandated to receive, verify, and examine applications for variety registration; receive and store reference seed samples; request additional information from applicants; and notify the approval or rejection of new varieties in the national catalogue. In contrast to the process outlined in the ECOWAS Procedure Manual, the process for variety release and registration in Nigeria involves several institutions, including the NARS, NACGRAB, NASC, the Seed Registration and Release Committee, and the NVRC.

Under ECOWAS rules, a designated individual within the NSC should receive applications for registration from the breeder, which should include information of genetic origin, a description of the variety, results of at least three trials conducted at the national level during the two-year period prior to the application, ranking of the variety, and an appropriate denomination. If the variety is genetically modified, it should be clearly stated in the application. The applicant must also submit a reference sample to the NSC.

Under the ECOWAS Procedure Manual, an application is then reviewed by a person designated by the NSC, recorded in the prescribed form, and assigned a file number. The designated NSC official then assesses the newness of the variety, completeness of the application, and the applicant's right to apply for registration. If the application is complete and in order, a verification report can then be prepared by the designated NSC official within a timeframe provided in the national regulations, and a deposit date is given to the application. If the application is incomplete, the designated NSC official should request additional information, which the applicant shall have to provide according to the timeline established in the notification.

The ECOWAS Procedure Manual recognizes that there could be confidential business information in the application for release and registration of a variety. When the applicant asserts that confidential information is included in an application, the NSC or a person authorized by it shall safeguard it as appropriate.

After receipt of the application, the designated NSC official subjects the variety to technical examination to verify that it fulfills the DUS and VCU requirements, following the national/regional testing protocols for DUS and VCU. For the four AVISA priority crops (sorghum, cowpea, groundnut and millet), the following testing requirements for DUS and VCU apply under the ECOWAS Procedure Manual.

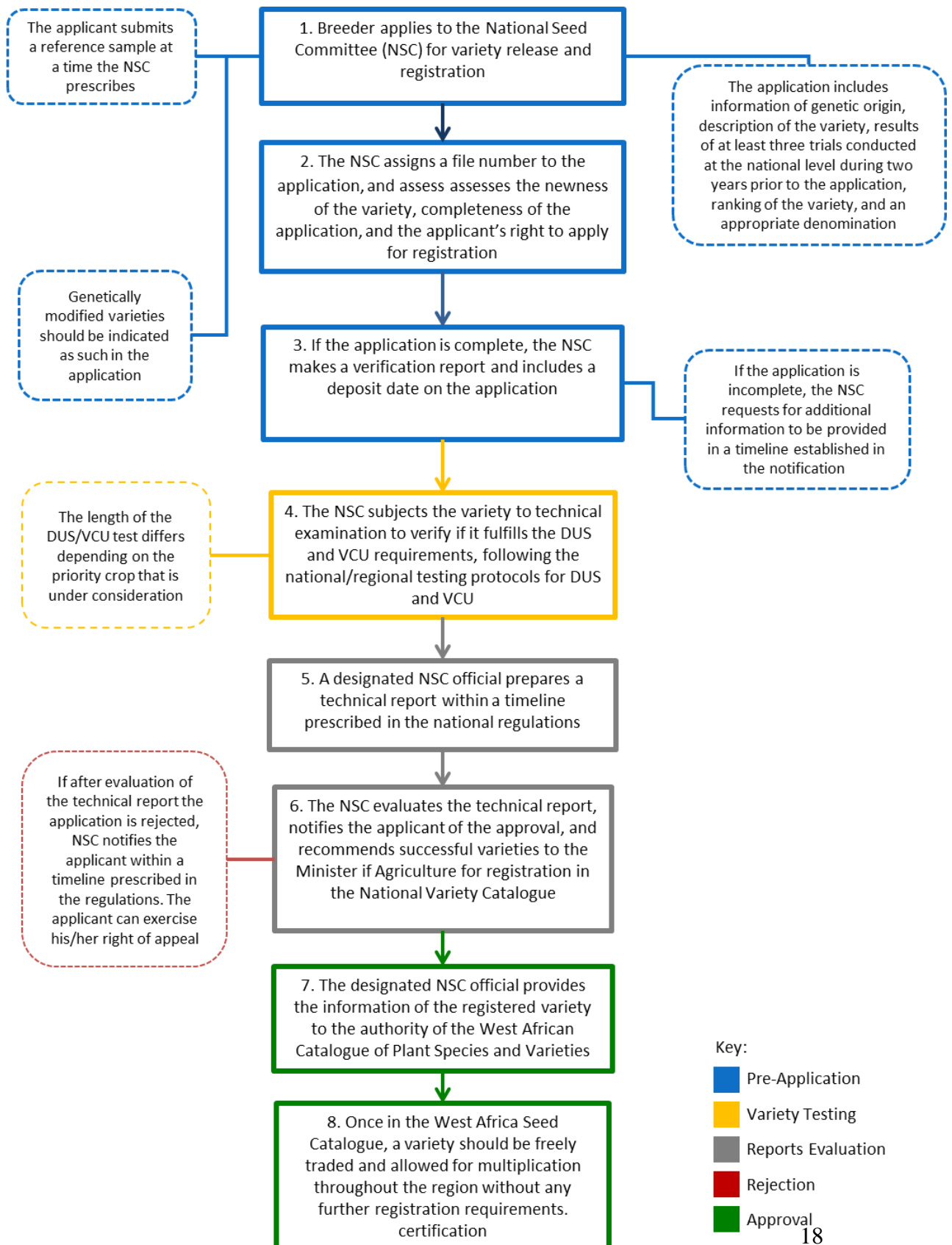
Table 2: ECOWAS Procedure Manual DUS and VCU Testing Requirements for AVISA Priority Crops

Crop	Conditions of DUS testing	Conditions of VCU testing
Sorghum	<ol style="list-style-type: none"> 1. Minimum duration: one rainy season at one location in the target region; 2. Field tests should be carried out under conditions of normal growth; 3. Each test should include 100 plants divided between two or more replicates; and, 4. Additional tests for special purposes may be established. 	<ol style="list-style-type: none"> 1. Testing sites should be within target ecology indicated on the application form; 2. Testing sites should be in farmers' fields; and, 3. Minimum of 4 sites per season and 2 seasons for grain yield.
Millet	<ol style="list-style-type: none"> 1. Minimum duration: one rainy season at one location in the target region. 2. Field tests should be carried out under conditions of normal growth. 3. Each test should include 100 plants divided between two or more replicates. 4. Additional tests for special purposes may be established. 	<ol style="list-style-type: none"> 1. Testing sites should be within target ecology indicated on the application form. 2. Testing sites should be in farmers' fields. 3. Minimum of 4 sites per season and 2 seasons for grain yield.
Cowpea	<ol style="list-style-type: none"> 1. Tests duration must cover two independent vegetation cycles. 2. The competent national authority decides the quantity of the vegetative substance required to carry out the examination of the variety. The minimum quantity is 1,000g. 3. Tests must be carried out in only one location. If this place is not favourable for bringing out some characteristics of the variety that are useful for DUS testing, an additional location is allowed. 4. Unless there is a contrary indication, all observations on isolated plants must be done on 20 plants or plant parts taken from each of these 20 plants and all other observations must be made on all test plants. 	<p>The duration of the cultural trial is normally two years; it can, exceptionally, be carried beyond, when the competent section of the Seed Technical Committee deems it necessary.</p>

Groundnut	<ol style="list-style-type: none"> 1. The minimum duration of tests should normally be two similar growing periods. 2. The tests should normally be conducted at one location. If any important characteristics of the variety cannot be seen at that location, the variety may be tested at an additional location. 	<p>The VCU trial normally lasts two years; it may exceptionally go beyond, when the experts of the Seed Technical Committee judge it necessary.</p>
------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------

After testing, a technical report is prepared by the NSC designated official within a timeline prescribed in the national regulations. If, after considering the technical evaluation report, the NSC rejects the application, the applicant can be notified in a time period prescribed in the national regulations and can exercise his/her right to appeal in accordance with the procedure described in the ECOWAS Procedure Manual. If the NSC considers the application successful, it will recommend registration of the variety to the relevant Minister of Agriculture. The designated NSC official publishes the registration in the form prescribed, and notifies the applicant of the approval through a memo. The designated NSC official then provides the information on the registered variety to the authority of the West African Catalogue of Plant Species and Varieties. Figure 3 (New Markets Lab Regulatory Systems Map) summarizes the ECOWAS Variety Release and Registration Process.

Figure 3: New Markets Lab Regulatory Systems Map for the Variety Release and Registration Process in ECOWAS



Through the new NASC Act, Nigeria has taken parliamentary action to harmonize its regulatory framework with the ECOWAS Seed Regulations, specifically recognizing the West African Catalogue of Plant Species and Varieties. The NASC Act, however, does not yet have regulations to streamline the variety release and registration process and align it with the ECOWAS Procedure Manual for Variety Registration in the National Catalogue for Crop Species and Varieties in West African Countries. In the meantime, Nigeria's 2016 Guidelines for Registration and Release of New Crop Varieties in Nigeria are being applied until regulations are passed under the new NASC Act to completely harmonize the variety registration process with the ECOWAS Procedure Manual (the 2019 NASC Act does include reference to application of the ECOWAS Procedure Manual). Table 3 below includes a comparison of the ECOWAS variety release and registration procedures and relevant procedures under current Nigerian law and regulation.

Table 3: Comparison of Nigeria’s and the ECOWAS’ National/Regional Variety Release and Registration Procedures (2019)

Nigeria’s Variety Release and Registration Process	ECOWAS National/Regional Variety Release and Registration Process
<p>New Domestically-bred Variety:</p> <ul style="list-style-type: none"> • On-station DUS trials for two seasons • Multi-location VCU trials for two seasons • On-farm trials for one season on at least 10 farmer fields across different agro-ecologies <p>Foreign-bred and Registered Variety:</p> <ul style="list-style-type: none"> • Limited multi-location variety verification trials in accordance with rules and procedures that shall be set by the Seed Registration and Release Subcommittee. <p>Variety Registered Under a Regional Variety System:</p> <ul style="list-style-type: none"> • Testing waived by the Minister of Agriculture and Rural Development, on the advice of the Seed Registration and Release Subcommittee (which shall be established by NASC) 	<p>New Variety:</p> <ul style="list-style-type: none"> • The length of the DUS and VCU tests depends on the crop in question. • For AVISA priority crops, DUS tests are conducted for a minimum of two seasons, while VCU tests are conducted for a minimum of one or two seasons, depending upon the crop.
<p>Regionally Registered Varieties:</p> <ul style="list-style-type: none"> • Not to be tested 	<p>Regionally Registered Varieties</p> <ul style="list-style-type: none"> • Not to be tested

Once in the West African Catalogue of Plant Species and Varieties, a variety should be freely traded and allowed for multiplication throughout the region without any further registration requirements.

Licensing Agreements

Licensing agreements are contracts between two parties where one party authorizes the other to use and commercialize a plant variety in exchange for a royalty payment. They

have been used in Africa for several decades, with positive outcomes.²⁴ Outside of Nigeria's National Seed Policy, which provides guidance but not binding law, Nigeria's current legal and regulatory framework for seed does not include provisions regarding licensing agreements. However, Nigeria's more general rules on seed, along with Nigerian contract law, would apply. NARS and CGIAR Centers would benefit from being aware of the different dimensions of licensing agreements, which can be concluded independent of or based on PVP and PBR rules. More information on the different models and options for entering into licensing agreements can be found in the *Annotated Guide on Flexible Licensing Models and Agreements*,²⁵ and a Nigeria- or NARI-specific model agreement could be developed.

When used as a channel for commercializing new varieties, public research institutions can give private companies, or other public institutions, access to germplasm and authorize registry in the national (or regional catalogue), or public institutions can grant the right to commercialize an already registered variety in the national or regional market. The former model is more common between CGIAR Centers and NARS or private companies (although the CGIAR Centers rely upon a Standard Material Transfer Agreement and not licensing agreements), and the latter is more common between NARS and private companies. In exchange for use rights, a private company would agree to pay a royalty fee to the public breeder. In this sense, licensing agreements not only formalize relationships between the public and private sectors, but they also create alternative sources of income for public research institutions that can be reinvested into future varietal development programs.

Overall, licensing agreements can be used as vehicles to get more public varieties into the market, either by licensing the right to register a variety in national or regional catalogues or by transferring the right to commercialize a variety that has already been registered. There is often a misconception that licensing agreements can only be entered into if a variety has been protected under PBR. Even though licensing agreements of PBR protected varieties are common, in many countries in Africa, public institutions have entered into licensing agreements with private companies for varieties that are not protected under PVP frameworks. However, a conducive legal and regulatory framework on PBR could be beneficial to public institutions. The trade-offs of entering into one type

²⁴ New Markets Lab, "Case Study on KALRO Model Plant Varieties Licensing Agreement," Syngenta Foundation for Sustainable Agriculture and New Markets Lab, 2019, publication forthcoming.

²⁵ New Markets Lab, "Annotated Guide on Flexible Licensing Models and Agreements," New Markets Lab and SFSA, publication forthcoming.

of licensing agreement over another are explored in more depth in the AVISA *Annotated Guide on Flexible Licensing Models and Agreements*.²⁶

Plant Variety Protection and Plant Breeders' Rights in Nigeria

The National Seed Policy of Nigeria recognizes the efforts of inventors in the seed industry and calls for the safeguarding of such inventions and remuneration through royalties for at least 10 years, to enable inventors to recoup the expenses incurred during research and variety development.²⁷ While this provides helpful guidance, it is an ambiguous and non-binding provision that would require an act or regulations to be enforceable, including criteria and procedures for claiming to be an “inventor” entitled to PBR and protection of the invention technology. Under the new NASC Act of 2019, NASC is mandated to approve and implement programmes and measures designed to promote the protection of PBRs.²⁸ The NASC Act further provides for the granting of PBRs for new plant varieties based on internationally recognized criteria but calls for a PVP Act (currently in draft) to be passed by the National Assembly.²⁹ A PVP Act, once in place, would also ensure protection of farmers' rights.

Notably, Nigeria is a member of the African Regional Intellectual Property Organization (ARIPO); an African regional organization focused on intellectual property rights. In July 2015, ARIPO adopted the Arusha Protocol for the Protection of New Varieties of Plants, which created a regional framework for PVP based on the 1991 UPOV Convention. Nigeria is currently working to become a full member of UPOV and has a draft PVP Bill before the Nigerian House of Assembly which will bring Nigeria's law in line with ARIPO, the WTO Agreement on Trade-Related Aspects of Intellectual Property (TRIPS Agreement) and ECOWAS, which also calls upon countries to put in place legislation establishing an intellectual property system for seed. It is also worth noting that a number of ECOWAS Member States are also members of the African Organization of Intellectual Property (OAPI), and Annex X of Bangui Agreement establishing OAPI, would extend PVP protection on a regional basis.

²⁶ New Markets Lab, “Annotated Guide on Flexible Licensing Models and Agreements,” New Markets Lab and SFSA, publication forthcoming.

²⁷ Clause 4.5 of the National Seed Policy, 2015, page 18. Available at: https://nesgroup.org/storage/app/public/policies/National-Seed-policy_1562696305.pdf.

²⁸ Section 38(b) of the NASC Act.

²⁹ Section 39(1) of the NASC Act.

When considering whether to use licensing agreements or claim PVP once additional changes are put in place in Nigeria, NARS and CGIAR Centers should be aware of the following:

- NARS and CG Centers could expand use of licensing agreements under Nigeria’s current legal framework, taking care to ensure that the licensing agreements balance public priorities and expand access to improved seed varieties by smallholder farmers. These agreements could focus on increasing registration of public varieties in Nigeria, and thereby the ECOWAS regional catalogue, and expanding the commercialization of public varieties.
- Having a strong legal and regulatory framework for PBRs could better protect NARS and CGIAR Centers when engaging with private seed companies to register new public varieties in the national and regional catalogues and/or commercialize public varieties, although this could also be done through licensing agreements that are not based on PBR.
- There have been successful examples of use of licensing agreements by public breeding institutions, such as the Kenya Agriculture and Livestock Research Organization (KALRO), which has used licensing agreements to commercialize public varieties and earn royalties to support public breeding.³⁰

Main Findings And Questions For Discussion

Nigeria’s seed regulatory system recently underwent significant changes, some of which are still being implemented. While the NASC Act was an important step in harmonization with the ECOWAS Seed Regulations, regulations are still needed to operationalize the NASC Act, including the adoption of the ECOWAS Procedure Manual on the Variety Registration in the National Catalogue for Crop Species and Varieties in West African Countries. In addition, Nigeria’s current legal and regulatory system still differs from ECOWAS in some notable respects, particularly with respect to the number of seasons of DUS and VCU testing required and need for on-farm trials. For the AVISA priority crops, DUS tests for a minimum of two seasons and VCU tests for a minimum of one or two seasons are required under the ECOWAS rules, depending on the crop.

Full alignment with the ECOWAS seed regulatory system would streamline variety release and registration processes in Nigeria and the region more broadly, enabling an

³⁰ New Markets Lab, Case Study on KALRO Model Plant Varieties Licensing Agreement, 2019.

increase in registration of public varieties. This could be particularly beneficial for NARS and CGIAR Centers to bring their developed varieties to broader regional markets. In particular, regional variety registration may be beneficial when coupled with licensing agreements to commercialize publicly-bred varieties by private seed companies, which have the financial capacity to do so. As more countries implement ECOWAS rules, the potential for dissemination of public varieties through the ECOWAS regional catalogue will increase, and Nigeria could become a hub within West Africa for regional commercialization.

Questions for Discussion:

- 1) *How many public institutions have registered varieties on the Nigerian Crop Varieties Release Catalogue and/or West African Catalogue of Plant Species and Varieties? What are the main challenges that public institutions face regarding variety registration, and what could help facilitate a greater number of public varieties registered across crops?*
- 2) *What is the current common experience in completing the variety release and registration process? Are there still inconsistencies and delays? Are the national breeding institutions becoming increasingly active?*
- 3) *According to the World Bank EBA, some public institutions have licensed some of the public varieties to private seed companies. Which public institutions have used licensing agreements, and which varieties have they licensed? Do they find them to be a useful tool? What are the main challenges to increasing use of licensing agreements?*